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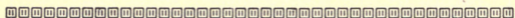
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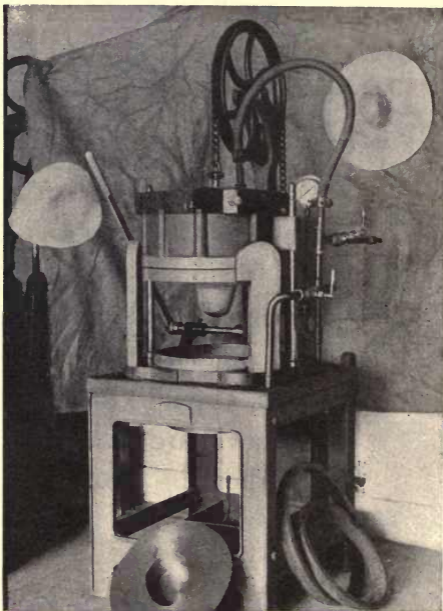
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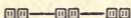
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THEIR HISTORY
AND MANUFACTURE

BY

HARRY INWARDS

EX-PRESIDENT LUTON CHAMBER OF COMMERCE



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FOREWORD

IT will be noticed throughout this book that the author has deviated from the dictionary methods of spelling words illustrative of the action of *plait*.

The *Oxford Dictionary* reads—

“ *Plait* (pleit, ploet, plit) . . . see also *plat*.”

“ *Plat*. To form hats, etc., is now a less usual spelling than *plait*.”

“ *Plat-ting*, the action of *plat*.”

Nuttall gives the pronunciation of *plait* as plate, and that of the action word *plaited* as *plated*.

In the district where the manufacture is sufficiently ancient to have established a claim to its regular pronunciation, *plait*, as it is invariably spelt, has always been pronounced *plat*, and the action words *plat-ter*, *plat-ted*, and *plat-ting*.

That this is not a local solecism of pronunciation is proved by the renderings given under the headings *plat* and *plating* in the *Oxford Dictionary*, and further, a literary and ancient example can be found in “A Lover’s Complaint,” where Shakespeare speaks of “a plat-ted hive.”

The author thinks it is time some definite method, in proper accord with the custom of the industry, should be adopted, and he proposes a precedent, which he claims to be well founded and sensible, viz., to continue to use the word *plait* (pronounced *plat*) as the substantive, and to establish the spelling *plait-ter*, *plait-ted* and *plait-ting* as designations of the action words properly interpreting the universal pronunciation.

I should like to express grateful thanks for assistance

and information given me in the course of my work, to Messrs. Murry Barford (Mayor of Luton), of Barford & Sons, Luton ; Percy Currant, of Currant & Creak, Luton ; Henry George Draper, of Walsh & Sons, Luton ; George Field, of Luton ; Henry Gregory, of Gregory & Sons, Barbican, London, E.C. ; Charles Hubbard, of Luton ; Thomas Mann, of Vyse Sons & Co., Luton ; James Saunders, F.L.S., of Saunders & Son, Luton ; Frank E. Shoosmith, of Luton ; John Irving Wright, J.P., of Luton ; all of whom have intimate knowledge of the straw trade and its machinery ; and to Mr. T. Maw, Librarian Luton Public Library.

The help of these gentlemen has materially added to the correctness of many details, of which my knowledge was uncertain.

HARRY INWARDS

LUTON.

31st March, 1922.

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STRAW HATS

CHAPTER I

ORIGIN AND CLASSICAL HISTORY

THE origin of what is known as a " Straw Hat " is lost in the mists of antiquity.

Ambiguous references to what may have been hats of vegetable materials are to be found in the works of almost all ancient writers, but very little that is specific can be discovered. Perhaps one reason for the paucity of information on this subject may be that the home made hats of plaited straws or rushes were probably worn only by the common people. With society, as it existed in early days, if such were the case, the matter would be considered almost too vulgar for the classical writers to mention.

Doubtless in the earliest stages of human development any kind of convenient material was utilized by primeval man in the endeavour to keep his head or body warm or cool as the case might require.

Now the mere fact of the shelter afforded by trees would create some inducement towards using leaves for covering the body, for one may assume that even before vegetable products were gathered and used, say, as thatch, for collective shelter, some of them were adopted for individual protective purposes.

The earliest reference to such is the well-known account of the " aprons of fig leaves " mentioned in the third chapter of Genesis. This primitive method of clothing was soon followed by the use of skins (as noted

later in the same chapter), but even in this record the vegetable product was used by man before that of animals, and shows in a most unmistakable, even if allegorical, manner, the natural trend of all development, viz., that articles easiest to procure are those that are first used.



FIG. 1

PETASUS, FROM PARTHENON FRIEZE
(ELGIN MARBLE) BY PHIDIAS (circ.
450 B.C.)

Shaded part is now broken.

It is, therefore, not unfair to assume that the manipulation of vegetable fibres, such as leaves, rushes, straws and other similar products, was really the earliest textile operation. That once conceded, it is no long step to the use of the "plaited" article as a head covering.

The *Encyclopaedia Britannica*, in its articles on "Costume" and "Hats" states that the

"modern hat can be traced back to the *Petanus* worn by the ancient Romans when on a journey"; and similar hats, known as *Kausia*, were also used by the ancient Greeks on like occasions.

The Greek *Kausia* and the Roman *Petanus* are described as "hats of a pliant material which could be bent down at the sides like that worn by *Atalanta*."

La Croix, a French writer on the subject, assures us that the early Romans and Franks "sought Bast and

Straw of which to make them hats," and there is an antique statue of Mercury in the Vatican at Rome, which has for head covering a hat of a "wide-awake" nature, sculptured in close imitation of a finely plaited straw.

The Goddess Hera (the Grecian name for the Roman Juno), Queen of Olympus, is depicted on ancient vases, coins and statues wearing a *Stephanos* [one of the statues, the original of which was by Praxiteles (350 B.C.), representing *Hera Teleia* standing, is known to moderns by copies to be found in the Vatican and other museums]. Pausanias

(c. 160 B.C.) speaking of the coins of Argos, specifically describes *Hera* as wearing a *Stephanos*. This was a head covering consisting only of a crown, similar in shape to a modern Turkish fez inverted, of the same breadth and height all round, and was made of various vegetable products.

In the British Museum is to be seen a small terra-cotta figure seated wearing the above sketched *Stephanos* in which the plaiting marks of coarse vegetable fibres are very distinct. This is probably the earliest extant record, in the plastic art, of a straw hat.

"Wicker work (*poloi kalathoi*) was also used by the ancient Greeks to make brim-less hats." (Gerard. Antike Bildwerke.)

The ancient Etruscans wore what was known as a *Tutulus*, a brimless hat with a high pointed centre to the crown; and a broad brimmed hat



FIG. 2

STEPHANOS, FROM
TERRA-COTTA (700 B.C.),
BRITISH MUSEUM

similar to the *Petagus*, but with a pointed top like the *Tutulus*.

Etruria covered the district now occupied by the Italian straw plait and hat makers, but while there is an extreme likelihood, from the shape of the hat in the accompanying sketch, that the denizens of this fertile champaign, producing as it does, and probably did, unlimited materials that could be plaited, made these



FIG. 3
ETRUSCAN HAT (*circ.* 440 B.C.), HEAD OF PELEUS
FROM PAINTING ON EARTHENWARE DISH FOUND
IN A TOMB AT VULCI

hats of straw, there is no definite information as to their being constructed of any vegetable fibres.

Another very important link of classical interest with the remote past is shown in the two sketches of hats and bonnets as worn by the ancient inhabitants of ill-fated Pompeii.

The mural decorations of this long-buried city illustrate in a far more cogent manner than any other known examples, the probable actual appearance of the people who lived there before its catastrophe, and

the hat shown on the head of *Penelope* is a model that has been imitated during the last thirty-five years. The little knob on the top is, however, quite novel.

The other example from Pompeii is from a comic fresco in which two men, dressed as women, are having an altercation, and here the artist has not only shown the lines which indicate the ridges of a woven vegetable fibre hat, but this painting provides the first known drawing of a *Bonnet*. Note the tilt at which it is worn, and

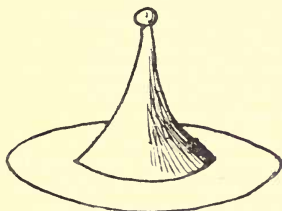


FIG. 4

HAT WORN BY PENELOPE



FIG. 5

BONNET

the portion cut out at base to admit the neck, and also the absolute resemblance to what is known as a "Granny" Bonnet.

A very famous writer of antiquity (perhaps the one best known, except Caesar, to all scholars of Latin), Virgil, makes allusion in his *Pastorals* to the "plaiting of osiers and willows."

Probably there is no race of men that has so closely maintained to the present time its ancient forms of clothing, as have the Arabs; and they occasionally wear a hat made of twisted bands of straw similar to a beehive. They are the only Moslems that do, and

there is no trace of any other people of that religion wearing a similar head covering.

All this evidence from the Graeco-Roman and other ancient sources proves that the making in some way of straw hats was fairly general even in the earliest times in the countries of Asia Minor and south-eastern Europe, but some writers on the subject favour the claims of the Black Forest of Germany as having been the birth-place of the industry. This, of course, may be so, although no Germanic or Teutonic writers of equal antiquity have handed down such direct evidence as that of the Graeco-Romans.

But it seems a little invidious for any special part of the world to make such a claim, for doubtless the weaving of vegetable fibres was not confined to any particular area, but that primeval man all over the world practised the operation for his own needs.

There are no British records of straw hats until A.D. 1459, when it is narrated that Sir John Fastolfe died possessed of "ij Strawen hattes"; the "*Promptorium parvulorum*" of about that date renders the "hatte of straw" as *capedulum*.

Spenser, Shakespeare and Thynne, brilliant luminaries of the Elizabethan period, all make allusions to the straw hat.

Spenser, the Poet Laureate of Good Queen Bess (who herself is said to have worn a straw hat that may still be seen at Hatfield House), quite early in the sixteenth century says—

"Some plaid with straws," etc. :

while Thynne, about 1570, in his "Debate between Pride and Lowliness" writes of a man with

"A *strawen hatte* upon his head

"The which was fastened underneath."

Shakespeare in *The Tempest* (Act IV, Scene 1) makes *Iris* say—

“ You sunburned sicklemen, of August weary
 “ Come hither from the furrow, and be merry ;
 “ Make holyday : your *rye straw hats* put on
 “ And these fresh nymphs encounter every one
 “ In country footing.”

In *A Lover's Complaint*, the immortal bard still further emphasizes the use, which apparently was fairly general, of the straw hat—

“ Upon her head a platted hive of straw
 “ Which fortified her visage from the sun.”

This passage is interesting first on account of the use of the word *hive*. This object, as used for beekeeping, was without doubt very familiar to Shakespeare, and therefore the maid's head covering, as it existed in the imagination of the poet, was probably similar to that worn by the Arabs mentioned previously, for she and they wore it as a protection against the sun's heat. Second, Shakespeare's spelling of the word “platted” was undoubtedly the method of spelling current at the time and was phonetic. (The author in the “Foreword” bases his reasons for using the double T in “plaitting” or “plaitter” in conjunction with the modern spelling of the word on this and other more recent well-known examples of literature co-eval with the birth of the trade in Great Britain.)

Ben Jonson, the Poet Laureate of James I, about 1630, in an epigram to Lady Mary Wroth, writes—

“ He that saw you wear the wheaten hat,” etc.

The inimitable diarist, Pepys, describes an actress at the Duke's Theatre as “dressed like a country maid with a straw hat on” : and mentions that while staying at Hatfield, “The women (of the party) had pleasure

in putting on some *Straw Hats*, which are much worn in this country, which did become them mightily, *but especially my wife!!*"

It may be interesting at this point to mention a widely known subject, of which interpretations have been greatly at fault. One of Peter Paul Rubens' best known paintings is entitled "La Dame au Chapeau de Poil." The subject is of a lady wearing a large brimmed and somewhat high crowned hat adorned with a sweeping plume of feathers, and many writers on straw hats have endeavoured to show that the hat of the picture was made of straw, arguing that the word "Poil" in the title was an ancient form of the French word for straw, viz., "Paille." It is true that some old Gaelic writers in mentioning the stalks of cereals have used various methods of spelling the equivalent for straw; "Pail," "Paile" and "Paill" are to be found in sixteenth and seventeenth century books, but in no case has the word "Poil" ever been used, and quite rightly so, because this word means an entirely different thing, and is used to-day with the same spelling and for the same purpose as it was in the sixteenth century. "Poil" means "nap," a raised "pile," which can be obtained on various fabrics. This consists of a sufficient number of the loose ends of the staple, of which the material is woven or felted, being left on the surface, or afterwards raised by means of combs, etc., so as to form either a velvety richness on which the loose ends stand upright, or a glossy finish, like that obtained on a man's top hat, where the loose ends are smoothed down. The real translation of the picture's title is "The lady with a Pile hat," in this case undoubtedly of some felted nature and of which the actual modern equivalent would be either a beaver, flamand or velour.

From this time onwards, as printing became more

general, allusions to straw hats became frequent, and, with the advent of periodicals of fashions, etc., for ladies, both letterpress and illustrations confirm their widespread use. Naturally detail began to be given, and the poet Gay (cir. 1714) in his *Pastorals* sings of

“ My new straw hat, thus trimly lined with green.”

In the *Ladies' Dictionary* (1694) under the heading of “Apparel,” straw hats are mentioned as among the things “necessary to feminine adornment.”

Miss Constance Isherwood says that “Straw hats—became the rage among the reigning beauties of Queen Anne's court and the early Georgian period.”

The Ladies' Magazine of the eighteenth century has many plates showing various styles of what are certainly straw hats, the design and manipulation of the straws in woven hats and the detail of the plait in sewn hats being very carefully and distinctly engraved.

These excerpts from ancient as well as more recent authorities all tend to show the widespread use of the straw hat, and prove that the term “straw” was, as it is now, a most comprehensive one, and one in no way entirely confined to the stalks of cereals.

But they also show that, although straw hats were made all over the Continent, etc., the work on them was purely individual and local. There were no recognized centres of manufacture or distribution, for, excepting the fact that some localities were more productive of suitable materials for plaiting than others, the making of straw hats was universal, and it is not until the sixteenth century that any reliable information is obtainable of special centres for straw hat production. According to Cesare Cantu, a well-known Italian historian, the manufacture of hats of straw in the neighbourhood of Florence, for distribution outside the locality,

can be traced back to the fourteenth century. This is probably quite true, but unfortunately the statement is not corroborated by any contemporaneous evidence. But in the year 1574, Signa, a village near Florence, was entitled "the original seat of the industry." (From a consular report.) It is, therefore, almost safe to declare that the commercial life of the straw hat began in the district of Florence, and here, probably, for the first time in history, were to be found gathered together in sufficiently large numbers to make their wares marketable, persons both male and female engaged in weaving straws into hats, or *capelli*, or in plaiting straws into braids, which were called *paglia* or plait.

From Tuscany to Piedmont is not a "far cry," and Coryat in his *Crudities* (a work published in 1611 and consisting of a series of observations made in a journey through Europe) says, "at many places in Piemont I observed most delicate strawen hats, which both men and women use in most places of that Province."

Again, Piedmont is not very distant from Lorraine, and it is from this latter district, which was the country of the birthplace of her mother, that Mary, Queen of Scots, is said to have brought plaiters to Scotland in 1552, and thus to have introduced the art to the British Isles.

Some writers on this subject, failing to discriminate between plait and hats, adduce many adverse arguments (*see* below) when the claim is made that the unfortunate queen established the trade in the coasts of Britain. These point to the undoubted fact that straw hats were made both in Scotland and England before her time. That, of course, is quite true, but what is not equally certain is whether the hats made in the British Isles before 1552 were hats woven in one piece, or hats made of plaited braid sewn afterwards in some manner to

the required shape. In the old account of the transaction one reads that in Lorraine Mary noticed the people "profitably employed, some in plaitting straws and others in working (*sic*) the straw plait into hats." It is, therefore, evident that it was an established industry in Lorraine and that *both* operations were being carried on. One may also deduce that, while the weaving of hats may have been common in Scotland, the making of plait and the subsequent making into hats was a novelty to Mary, and, therefore, in the interests of her Scottish subjects, she endeavoured to promote a similar industry in which they also might be "profitably employed."

The late Mr. John Waller, of Luton, a member of one of the oldest families connected with the straw trade, after a careful and apparently unbiased investigation, says that the statement about Mary being the founder of the industry "can only be regarded as pleasing fiction"; and to support this quotes from Oldmixon's *History of England* (edition of 1724) "That the manufacture of straw plait had thriven for about 100 years in the neighbourhood of Hemel Hempstead and Dunstable." But from 1552 to 1624 is a long period, and one can easily imagine the natives of sunny Lorraine feeling none too homelike in "Caledonia, stern and wild." With the accession of James I (Mary's son) to the English throne, what could be more natural than the migration of these workers to more genial southerly temperatures, bringing with them their art? As James became king in 1603 there would have been plenty of time for the industry of making plait for sewing into hats being established between then and 1624, which would be exactly 100 years before Oldmixon's account! And speaking of the advent of the Lorrainers into Beds and Herts, Mr. Thomas George Austin, in

his book on the *Straw Hat and Bonnet trade of the Luton District*, writes, "It is said to be the true history of the introduction of the handicraft into England."

One must, therefore, come to the conclusion that the system of making hats from plait, as distinct from the weaving the hat in one piece, was introduced by Mary, Queen of Scots, to Scotland, and from thence the method came south, and for reasons which will be set out hereafter, settled itself in the regions of South Bedfordshire, North-east Hertfordshire, and East Buckinghamshire.

CHAPTER II

COMMERCIAL RISE AND GROWTH

THE history of a straw hat has thus been traced down to the latter half of the eighteenth century.

Prior to this period all kinds of straws, grasses, and fibres of vegetables had been utilized in the operation, the only limit as to material being the growths peculiar to the locality in which hat-making was carried on, so one may see that, as each locality probably grew different kinds of fibres, the result of the finished hats was different.

This difference early gave rise to local nomenclature, perhaps the first collective term was "Leghorn" (*circ.* 1650. Tomlinson's Cyclopaedia, 1867). This now well-known variety of straw hat, woven first in braids and then cunningly put together in spiral sequence to the required shape, is not sewn overlapping, but with the braids laid edge to edge, and a fine tough straw or other fibre threaded through every other head on the impinging edges of the plait, and then drawn tight, so that the opposite heads fitting between and inside each other assumed the appearance of being woven in one piece, except that where the join took place, the thickness caused by the heads of the plait and the threading material, produced a ridge which, starting from the centre and running spirally to the edge of the brim, is one of the prominent characteristics of a "Leghorn." This term, therefore, embodies, first, the place of origin; second, the material used; third, the method of using. If other local terms were thus early applied to straw productions, they have not, as far as the Continent of Europe is concerned, come down to modern times, all

other names now in use (and they are legion) are the products of the late eighteenth and the nineteenth centuries.

All the materials used for plaiting up to about 1745 had been worked *whole*, that is, the fibre whether rush, grass or straw, was plaited as it was grown, and consequently the hats of coarse weaving largely predominated ; there being naturally a preponderance of the coarser parts of any vegetable growth.

Further, the manipulation of the bigger fibres was easier to fingers perhaps only infrequently devoted to the work, and therefore up to this period the majority of straw hats were thick and weighty. There were exceptions such as *Leghorns* that were plaited from a variety of bearded wheat or rye (*Triticum turgidum*) grown in Tuscany. This was light in weight, comparatively tough, and of a fine natural golden colour. The upper part of the straw called *Punta* (or point) was used for all Leghorn hats, and also for making plait which was called *Tuscan*, from the locality of growth. When *Tuscan* was the only straw plait exported from Italy, Great Britain was one of the purchasers, and during the early part of the nineteenth century up to the repeal of the Corn Laws and the abolition of protective duties on other goods, British importers of *Tuscan* plait had to pay a duty of 8s. per lb. weight.

The desire to produce straw hats of less weight brought the bottom half of the straw column into use. That portion generally has a sheath, protecting it from the sun, which being stripped disclosed the under part of pearly white colour, this from being at the foot was called *pedale*, and although not so tough as the *punta*, was sufficiently so for plaiting purposes, and was very much lighter in weight. The first parcel of *pedale* plait arrived in Great Britain in 1878, and is supposed to

have been purchased by Messrs. Carruthers & Co., of Luton.

But even then the quantity of fine *pedale* straws grown did not suffice for the increasing demands for straw hats.

The Italian straw, being so well established as the best material, caused workers to endeavour to find similar straw in other countries which had adopted straw hat making as a commercial undertaking.

It is probable that the climate of Scotland was not alone the cause for the migration of the Lorrainers; the search for fine white, light, straws, impossible to obtain in the cold north, may have drawn these operatives to the southern parts of England. Whatever the actual reason or reasons, it is certain that by 1624 the neighbourhood of South Bedfordshire (Dunstable), North-west Hertfordshire (Hemel Hempstead), and probably East Buckinghamshire was producing higher grade straw hats than any hitherto obtainable in the British Isles. The district comprises practically the whole of the Eastern ranges of the Chiltern Hills, an area of chalky subsoil. The discriminating Lorrainers quickly discovered the extreme beauty of colour of the Chiltern straws, and it is almost certain that for this reason alone the art of making plait braid was introduced into the locality, which from 1624 onwards has been undoubtedly the centre of the British straw hat industry.

Later on the straw plait making spread to portions of Essex and Suffolk, and although the plaits produced there were of much inferior quality and colour to those produced in the Chilterns, and, generally speaking, were not utilized for the highest class work, they formed a very useful adjunct to the plait stocks required by hat manufacturers when large quantities were needed. Another English centre for straw plaiting was Ripon

in Yorkshire, the district around being the seat of quite a fair-sized industry. It is interesting to note this, for it seems to show that the Lorrainers in their southerly migration, had stopped *en route*, and had sampled the straws grown on the Yorkshire chalk.

But all this evidence tends to prove that the nature of the soil which produced the proper straw for plaiting caused the trade to localize around Dunstable. This ancient borough, practically in the centre of the plaiting districts, situated on the Watling Street, along which passed all the traffic between London and the north-west of England and Northern Wales, at the junction of the Ickniel way (another ancient Roman road crossing the Watling Street towards the east and west), was in the middle of the fifteenth century alive all day with the hum of people and merchandise travelling to and fro. Sitting astride of the trunk roads leading everywhere in Great Britain, it is small wonder that this little town, of vast ecclesiastical importance in the Middle Ages, but much decayed since the time of Henry VIII, became the place from whence all the products of the neighbourhood could be dispatched.

And, therefore, the name of "Dunstable," another of the now world-known local names, was given to the plait, hats and bonnets which emanated from the whole vicinity.

The great preponderance of coarse straws, combined with the increasing demands for hats made of fine plaits, caused straw workers to endeavour to make the straws smaller by splitting the "pipes" (as the whole straw is called) into narrower portions called "splints." This was done at first with a knife, but the result was generally unsatisfactory, although some skilled workers managed to acquire really wonderful deftness in the operation. It was plait called "Patent Dunstable "

made of these split straws that gave this plaiting area its first textile claim to distinction. Some one, now unknown, found out that two fine *splints* of straw laid together, inside to inside, produced when plaited an effect equal to that of the *whole* straw, and yet enabled plaiters to make the finest and narrowest widths of plait. The clumsy method of cutting with a knife was apparently the only possible way of making *splints* until the time of the Napoleonic Wars.

The French prisoners at Yaxley Barracks, near Stilton, produced "pretty and useful articles such as baskets, workboxes, mats, etc." (Mr. Alfred Tansley Soc. Art., 1860). These were decorated with "laid work," a kind of mosaic pattern made of coloured straw splints, cut to various sizes and pasted on suitable foundations. "For the purpose of making these splints, they used a straw splitter made of bone, about two inches long, brought to a point behind which a set of cutters was arranged in a circle, the point entered the straw pipe separating it into so many equal sized splints" (Tansley). This instrument was soon copied by a Dunstable blacksmith named Janes (some authorities say Norman) who made some in iron and turned the cutting parts at right angles to an elongated stem, which could be used as a handle. These were subsequently also made in brass, and in 1815 other varieties, in the form of metal wheels set in wooden frames, appeared. Mr. Tansley says, "To this invention may be attributed the success which in after times has attended the manufacture of straw plait in England."

The two methods of working straws, either *whole* or *split*, opened up a wide field for diversity of plaiting, and quickly novelties began to appear. From 1815 to the present day, at intervals sometimes short and sometimes very long, new designs of plait have been

put on the market, and now there is no style of shape that cannot be suitably fitted up with one or more plaits.

British plaiters have not been content to use only the straws grown in the five counties. They have ransacked the world for materials, *wood* cut into fine shavings or splints, *Manila grasses* or *hemp*, manufactured splints of *cotton*, *silk*, or similar fibres, stuck together in a flat ribbon called a "*lame*," *horsehair*, *bamboo*, *raffia*, and many other articles have been used for the purpose. At one time 30,000 persons were engaged in the plaiting industry, but by 1890 the number had dwindled to under 3,000. The reasons for this decline were manifold. Although the district had produced, and was still producing, straws better than any other continental centre, yet about 1855 the demand for something different from the plaits made solely of straw induced foreign plaiting communities to plait fancy materials which before had been used for other purposes. Switzerland and France began to make pretty and delicate patterns of plait or braid, woven both by hand and by machinery, of all kinds of fancy fibres such as silk, horsehair (or crinoline as termed by milliners), fine ribbons, etc., in various combinations of one or two or more of the above articles either with or without straws. Further attempts in the way of decoration were made by intermixtures of glass beads and bugles.

These very fanciful braids had a wonderful success, for they were especially adaptable for bonnets, which to about 1865 were much more in demand for fashionable wear than hats.

This invasion of a large quantity of displacing material adversely affected the volume of plaiting in England, and still further damage was done when Italy began to send over plain and fancy plaits made of willow shavings, as well as fine straw *punta* and *pedale* plaits similar

to *Twist*, which was by then the mainstay of the fine plait trade. (*Twist* was a 7 end straw with a twisted beadhead made of fine splints, two of which laid inside to inside formed one strand for plaitting.) In 1867 the "last nail in the coffin" of British straw plaitting was driven by the first import of plait from China, and in that same year the distress in and around Dunstable was so great that the then Mayor, Mr. Joseph Gutteridge, called a public meeting to discuss methods for its alleviation.

As the far eastern countries of China and Japan now play such an important part in the world's straw hat trade, it will be of interest to note how British traders first came in contact with their goods. Doubtless from time immemorial the deft "Chinee" had been accustomed to the weaving of grasses, etc., into hats and mats, and it is stated that the attention of Luton hat makers was first drawn to the possibility of getting plait from China, by seeing some "hats (mats?) which had been used for lining chests of tea."

Whatever the cause, in 1867, from plaited samples sent to them, the Chinese were able to imitate, in their native grown straws, the products of England in such an excellent manner and at such a low price, that the fiercest competition was at once created. People engaged in the trade were so exasperated at the circumstance, that they made an effigy of the importer and burned it in the Luton Market Place. The competition of the increasing bulk of China straw plait imports, together with the Italian imitation of Dunstable twist (called at first "Milan," and now generally known as "7 ends Pedal") made the plaitting trade in the five counties to decrease rapidly.

"The Society of Arts have at various times rewarded many individuals for successful attempts to introduce

bonnets formed of grasses indigenous to Britain," says Tomlinson, in his *Cyclopaedia* published in 1867, but all these well meant efforts to revive the industry were unavailing. Neither for price nor quantity (which latter was rapidly becoming almost the prime necessity) could British plaiters successfully compete with the Italians and the Chinese for plaits of narrow grades, although quantities of wider plaits both of plain and fancy designs continued to be made. About 1890 plait began to arrive from Japan, and just as the British straw was better than the Italian and Chinese, so the Japanese was superior to the British. It was of the most delicate pearly colour, it was infinitely lighter in weight, and it could be obtained in far bigger *pipes* than any European or Chinese growths, and its adaptability both for *whole* and *split* plaits was equal to all.

In straw plait, therefore, the Japanese were able to compete successfully, but in a short time they put on the market an article made of wood splints plaited with three strands, called "Chip 3 ends." This plait, of Italian make originally, from its extremely low price and colour possibility, was the material backbone of the ladies' hat trade for some years. In later times a braid made of hemp by machinery, called *Tagal* or *Tégal*, originated in Switzerland and Italy. Quickly adopted by the Japanese, they have been able to supplant the earlier producers, and as with the *Chip 3 ends*, to provide varieties which have almost monopolized the hat making markets for the million.

In 1896 the plaiting trade was in such a bad state that some of the principal hat makers in the district determined to attempt the rescue of the plaiters. For that purpose the "British Straw Plaiting Company" was formed, the writer of this book being appointed Chairman of a very representative Board of Directors.

Manufacturers were eager to assist, and for the first twelve months the company showed great promise. A revival of plaiting (although with other materials than straw and of fresh designs) ensued, and better prices were paid so that wages were much advanced. But the Swiss and Italians took fright, and for the next two years so successfully competed by cutting prices, that in 1899 the company was obliged to cease operations.

In fact, not only could better materials for plaiting be found in other parts of the world, but in those parts the natives, who (as the *Ency. Britt.* says about the Chinese) "could live where an Englishman would starve," were able to produce plait at prices which made it impossible for plaiters in England to earn a living. But fortunately as the plaiting trade declined the hat and bonnet making of Dunstable and Luton was increasing as fast as its predecessor fell.

In 1865 the first attempts to sew plait by machinery were made, previously all had been sewn by hand, a long and tedious process, when fine plaits were involved.

This took the form of sewing several pieces of fine plait in a parallel form, making strips of an increased width, which were then sewn by hand to the desired shape. A little later an American named Bodsworth introduced a machine which was capable of sewing plait into hats and bonnets, but unlike all subsequent models, which start at the centre of the top of the crown, this machine started sewing at the edge of the brim. This materially lessened the field of shape variety, and although great improvements were effected by skilfulness of working, and although the machine was adopted by Messrs. Vyse Sons & Co., it was not taken up generally by the trade.

The well-known firm of Willcox & Gibbs, makers of a domestic chainstitch sewing machine, had an agent in Luton named Edward Stratford, and about 1870 his

wife, in response to a friendly challenge, sewed the first straw hat from centre to circumference. The day following this epoch making occurrence Mrs. Stratford sewed another hat out of a fine make of "English China Purl" (a fine fancy edged plait); this hat is said to be still in existence.

From 1870 the whole trade was revolutionized, all fine plaits eventually were sewn by machine, only the coarsest and broadest widths being sewn by hand. In 1874 Mr. Henry Bland, a Luton mechanic, turned his attention to making alterations to the Willcox & Gibbs' domestic machine, in order to render it more suitable for sewing straw plait. He took out patents to cover his improvements, which were subsequently acquired by Messrs. Willcox & Gibbs, who issued the new machine to the Trade under the title of "The 10-Guinea" straw hat sewing machine. But this visible stitch machine had a fault which made it unsuitable for the best work, inasmuch as the stitch was prominent on the outside of the hat, and the demand for handsewn invisible stitch continued unabated for goods of the best quality. Various machines were introduced to imitate handsewing, most of them failures, but M. Légat, a Frenchman, patented one in 1875 that even up to the present time has never been surpassed for close resemblance in its work to that done by hand, but although the machine was taken up seriously by the best houses of Great Britain and France, its large initial cost, and heavy charges for maintenance, allowed it only to retain its supremacy pending the advent of a less intricate, delicate and costly model.

In 1878 Mr. Edmund Wiseman (who is still living), of Luton, took out a patent for a machine to sew plaits with a "concealed" stitch. In 1880 some improvements were made, and for some years the "Wiseman

Concealed Stitch" machine sold at about half the price of the "Légat," and by no means as intricate and delicate, gradually displaced the French machine. Between 1880 and 1886, Mr. Bland, of Luton, and Mr. William Walker of Dunstable, both patented concealed stitch machines, but without much success. In 1886 Mr. Wiseman entered into arrangements with the Willcox & Gibbs Co. to produce an improved concealed stitch machine that from its shape and method of action was called the "Box machine." This, although on the same lines as the first invention with regard to the method of stitch and sewing, was capable of sewing all kinds of plait both fine and coarse, whereas the earlier patent was only really successful on fine plaits. This Box machine has been greatly improved since 1886, but taken on the whole, its general characteristics are the same. In 1895 Messrs. Janes Bros., of Luton, took out a patent for a concealed stitch machine called the "Lutonia," which has met with a very distinct success. Meanwhile the demand for hats of certain plaits, which were improved by the outside stitch sewing, kept on increasing, and indeed there are plaits on which even the so called "visible" stitches are *invisible*. Plaits of cotton, silk, ajour, and crinoline are of such nature that the cotton used in the outside stitch machine sewing seems to lose or bury itself in the material of the braid, and there is less likelihood of the needle catching in their tough fibres than there is in the working of the Box machine, where a hook is used; and further for some years plaits of fine chip were the dominant demand, and for these there was less tendency on the part of the fine single needle of the visible stitch machine to cut the narrow wood strands, than if the double punctuation of the Box machine needle and hook were used. In 1879, therefore, the Willcox & Gibbs Co.

took out a patent for what is now known as the "17 Guinea" type of visible stitch sewing machines. This model has been closely followed by the "Dresdensia," a German product of signal value; and "The Singer," an American competitor, both of which are in the main imitations or copies of the 1879 patent. It is a fact worthy of note that the first successful machine to sew a hat of straw plait from button to circumference of brim was a Willcox & Gibbs, and that the latest word in straw sewing is also, by the arrangement with Mr. Wiseman, a product of the same firm.

Other machinery used for making straw hats consists of a variety of "Blocking" machines. As will be shown hereafter, the most primitive means were adopted at first, but when the hydraulic type made its appearance it soon left no room for any other method. The appliances of Messrs Desbordes, Desireau, Legat, Beresford, Keston, Brochier and Stoffel (described in Chapter XII) have now rendered possible the blocking of all kinds of shapes and materials by machine.

The plait mill, made of both wood and iron, completes the list of mechanical appliances used in making a straw hat.

But at the present time all hat sewing machines, which for at least twenty-five years were driven by the foot power of the operator, are worked by mechanical power, either from a gas or steam engine, or by electrical dynamos.

CHAPTER III

STRAW PLAIT—METHOD OF PREPARING THE STRAWS

THE foregoing details, mainly devoted to the classical and historical side of straw hat manufacture, have demonstrated that the word "straw" is very elastic in its meaning when applied to its use for making hats. All classes of vegetable fibres have been included at some time or other in its embrace, and to-day the range of materials technically known as "straws" is larger than at any previous time. But as the industry of straw hat making centred itself in the locality of South Bedfordshire on account of the superior straw, and because the process of splitting and subsequent manipulation effected a total revolution in straw hat working, a description of the processes common in that district will, with a few minor exceptions, serve as an example for all plait making. The straws used in England are principally those of wheat, the exceptions are very small. They are specially grown by careful methods of tillage, and at the proper period are cut either with the sickle or with the scythe, the mowing machine being likely to bruise the stalks. They are tied into suitable bundles, considerably smaller than the usual sheaf, with the ears of corn as nearly level as possible; these are then cut off and used for grain purposes. The bundles of straw are carefully "combed" with a coarse wooden comb to rid the stalks of all the loose portions and thin blades. They are then cut into the standard lengths, about 10 ins. long, and are ready for sizing. This is effected by working through a series of sieves, with somewhat deep sides. As the straws have been carefully

gathered with ears uppermost, it naturally follows that all the similar thicknesses of stalk are together, and therefore the process of sorting becomes a fairly speedy one. The cut lengths now become *straw pipes*, and they are first placed on the largest end in the largest grade sieve, the pipes smaller than the mesh fall through, leaving only those of the coarsest dimensions. This process is repeated until all the varying thicknesses of straw have been sorted into their respective sizes. They are then tied up carefully into bundles of about 5 ins. in diameter, and are ready for the plaitter.

In Italy, where the straw is grown solely for plaitting purposes, the process before sorting is a little different. The sowing of corn (*Triticum turgidum*, or *Triticum oestivum*, which is a species of rye) is done very thickly, so as to produce thin and short stalks. It is gathered when the ear is in a soft, milky state before the final stages of ripening. It is then thinly spread over the ground in fine, hot weather, and afterwards tied in bundles and stacked, so that the resultant heat may drive off all moisture. After remaining stacked for about a month, it is spread out and exposed to the action of dew, sun and air, in order to bleach it. During the exposure, which varies according to necessity, the stalks are frequently turned. When the bleaching process is sufficiently complete, the lower joint of the straw stripped of its outside thin sheath is divided from the upper one, which is still allowed to retain the ear. This process provides the *punta* and the *pedale*. The straw is then subjected to the action of steam and the fumes of sulphur. When this bleaching process is complete the assortment into sizes by sieves takes place, and the graded straws are then ready for use.

From this stage for making plaits of the whole or unsplit straw, the processes adopted by both England

and Italy are in the main identical; Italy, however, has not generally adopted the splitting processes for plait making on account of the fineness of her straws. But the British plaitter reserves the sulphur bleaching of the straws until the plait is actually made, for, with the excellent colour of the straw, in many cases this can be dispensed with until the need for hat making arises. The first processes of plaitting, either of hats or of braid, were undoubtedly of the unsplit stalks, and all "English whole straw" plaits were so made. It has been shown how and why the splitting of straws arose. The plaitter, having determined on the variety of plait to be made, acquired a sufficiency of suitable sized *pipes*. With the *splitter*, the point of which, inserted in the end of the straw, and pressed downwards, the tube of straw coming against the radially set cutters, the *pipes* were divided into *splints* of equal widths of a fineness according to the plaitter's requirements. These were then wetted so as to render them a little tougher and more amenable for manipulation and bending. The plaitter, with a bundle of splints under the left arm, and generally a few in the mouth, through the lips of which they are drawn to keep moist, commences operations. Any description of all the methods of plaitting would be tedious, all the operations consisting of a constant under and over locking of the splints, but in the split straw making of the "Patent Dunstable" the plaitting, instead of being of either one straw or splint, is of two, wetted and laid together, and in the varieties known as "Splits" the splints are plaitted singly, leaving alternately, or in a spaced pattern, according to the design required, the inside and the outside of the straw; the outside of silicate being shiny, and the inside with its slight pith (or *rice* as it is termed) being dull. The "Whole Straw Dunstable,"

the first plait made in the neighbourhood, was of seven entire straws, "Patent Dunstable" or "Twist" was of seven doubled strands, or *ends*, formed of fourteen splints. *Rice* similarly made, but with the splints inside out, making a plait of a dull white which was extensively used for bonnets for weddings. "Split" was formed of seven single split straws, presenting the varied appearance mentioned above, and was naturally the lightest of British fine plaits. "Luton" was made like "Patent Dunstable," but without the "Twist" head, making a flat plait similar to split but with both sides alike. "Bedford," made of eleven single or eleven double ends of twenty-two splints, similar to and in imitation of the Italian plait "11-end Tuscan," and "Rustic," a plait of four whole or split straws plaited to show pointed serrations on both edges. These plaits form the base from which all other straw plaits have developed; their composition and methods are to be found in every variety whether made in Great Britain or abroad, and although other hand-made plaits have larger or smaller numbers of "ends" (from three to almost any number upwards) their basis of treatment remains the same.

The two primary homes of plaiting straws into braids, Italy and Great Britain, had many features in common in the conditions and methods by which the plait was made. In both countries the whole of the industry was carried on by peasants and their wives. The males, who were generally agricultural labourers or small traders in rural districts, for the main part saw to the growing of the straws and their preparation and distribution for plaiting, followed after the braids were made by the marketing of the work done by their female friends or relations. In some districts, such as the environs of Florence and of the South Beds and

neighbouring counties, these occupations were of such magnitude as to give constant employment to many.

In all the districts the main labour of plaiting was undertaken by the womenfolk, although men at times took a hand, and in the middle of the nineteenth century it was a real feature of village life in the plaiting centres, to see the good wives and daughters, after the household work was done, standing at their cottage doors, swiftly and dexterously plaiting and at the same time distributing that gentle and yet satisfying gossip that was so dear to rustic life. In this manner by far the greater bulk of the plaits of Italy and Great Britain were made, although in the latter country since about 1825, some extra means of production were employed. Instead of the art being taught from mother to daughter, as was the earlier practice, schools of plaiting were instituted. These were generally arranged in the cottage home of one of the most expert plaiters, who for a small fee taught the youthful aspirants all the intricacies of the trade, while at the same time the instructor contrived to keep at work on her own particular plaiting. The view of a portion of a plaiting village, on a fine day, with its generally picturesque surroundings framing an active rustic group of women engaged in plaiting, was such as should have commended itself to many an artist, yet strange to say the pictures extant of either Italian or British plaiting scenes are very few and far between. These pleasant, pastoral occupations seem to have gone for ever from Great Britain, although one may still see in Italy the once familiar signs. Hand plaiting has migrated to the Far East, and there in China and Japan one can to-day see, with the changes consequent on the different setting of the scenes, the sights which seventy-five years ago were common to



FIG. 6

STRAW PLAITERS AT WORK—A BEDFORDSHIRE VILLAGE SCENE IN 1870

the countryside around Dunstable, Hemel Hempstead, and Luton.

Machine-made straw plaits have never been produced in quantities in England, although patents for plaiting have been taken out; but in Italy and Switzerland machinery has been in use since 1840, producing plaits of straw mixed with other fibres, such as horsehair or silk. Fiesole, a village near Florence, became a centre of machine-made plaits of Tuscan straw woven in Wattle fashion with strands of silk and cotton, and gave its name to all similarly made plaits.

The other continental centres making straw plaits were Switzerland and Belgium. By the former practically all the straws used were imported from Italy, only quite a small portion being home grown; but Belgium produced some beautiful straws, and the "Split" and "Piping" made in that country have never been surpassed. The "7 end cord," of same detail as "Patent Dunstable," although excellent in make and colour, missed the sharp twisted head (from whence the name "Twist") peculiar to the British made article, the straws being of too soft a nature to retain the desired effect throughout the hat-making processes. The methods of gathering and preparing the straws in Belgium closely followed the British.

China, the first Far Eastern straw plait competitor, is able to count on almost limitless quantities of straw, and the plaits made there are, as far as appearance is concerned, second to none. But while the British plaiter inserts only one or say two straws at a time, the Chinese frequently insert what is known as the *whole sett*; this naturally causes a greater weakness at the junction than is found in British plait, and for that reason many Chinese patterns, although beautiful to look at, are very difficult to work, and the probability

of some of these *setts* coming undone and the consequent raggedness of the *speels* (as the loose ends are called) make these plaits undesirable for the highest class work. But the Chinese, although not too adaptable, are nothing if not deft, and a few makes of plait are put on the market, which from their altered "setting" are known as "speelless." "Speelless Maslimpo," an imitation in very fine whole straws of Italian 7 ends pedal is one of the most beautiful fine plaits made, and although it seldom entirely justifies its adjective, in the main it is the least difficult Chinese plait to work up. The methods employed by the celestials in preparing the straws are tantamount to those employed in Britain, and the methods of splitting them are identical.

Japan occupies a unique position in the cultivation and production of straws for plaiting. The soil is extremely fertile, and the geological condition of the country is volcanic. The straws when grown attain to a great size of tube, even as much as $\frac{1}{3}$ of an inch in diameter, and plaits have been made of Japanese straws, split only in one place, which when opened out form a splint an inch wide, making braids of only 4 or 5 ends, about 3 ins. in width. The volcanic nature of the country seems to have permeated the soil with some bleaching agent. Sulphur is usually a product of volcanic eruption, and although its fumes are deadly to the growth of cereals, straws grown on volcanic soil acquire a colour which is unobtainable elsewhere. And the colour of the Japanese straw is entirely unlike, and at the same time vastly better than, any other known variety. Its rapid growth also engenders a special lightness of weight, and although not tough as the Italian or British, it is sufficiently so for any plaiting purposes. In this case the preparation of straws for working is simply the drying and sorting.

Cereals only have as yet been described, but two other vegetable products can almost claim by user to be classed as straws, as the straw hat making industry has adopted them in a very whole-hearted manner. One of the first vegetable plaits, other than those of actual straw, was made of fine splints of the wood of willow. This was sufficiently seasoned in plank, a finely planed surface obtained, and a planing cutter, with scoring knives set to the requisite width, was made to take a very thin shaving. This naturally produced the shaving in very narrow strips that were the *media* from which 3 ends, 5 ends, 7 ends and 9 ends "Chip" were plaited by hand. Also wider splints of willow shavings were used to make fancy patterns of plait, the number of which is legion. This branch of the industry emanated from Italy, and Saxony and the Black Forest subsequently did some business in chip plaits, but their shavings were not equal to the Italian, being more woolly and less glossy, and they enjoyed mainly a local success. About 1890 the Japanese began to make chip plaits, their wood was equal to the Italians, and their prices vastly lower, so that for some years, while the plait known as "3 ends Chip" monopolized the great bulk of the hat making requirements, Italy and Japan were keen competitors. As in the birthplace of chip plaits, so in Japan were subsequently made all kinds of fancy designs, which for some time nearly extinguished the Italian trade.

The other vegetable fibre is hemp. This was first used by the Swiss in the manufacture of a machine made braid similar in appearance to the hand plaited 9 or 7 end chips.

The fibre from which the first braids were woven was derived from an aloe-like plant *Sansaviera Zeylanica* (or bow string hemp) which grew in the island of Java

in a district called Tégál. This particular hemp when prepared was exceedingly lustrous and tough, and when put on the market in braids was called by the name of its native place. The name has been corrupted into several forms, Tagal, Tagel, Tagle, etc., but the proper name is Tégál, and this is still retained by the French, while in England the most popular form is Tagal. The method of weaving was to plait into braids, strands formed of one, two or three, or even more fibres of the hemp, and plaits were marketed conveying those features, such as "13/2" (which meant 13 strands of two fibres), or "13/3" (thirteen strands of 3 fibres). This shoelace like braid was soon followed by a design similar to Italian 7 end Pedal, and was at first known as "Tégál Picot," but is now more generally called "Pedal Tagal." When worked this plait has a very close resemblance to its model, and like all the other hemp plaits, will take a softly brilliant and regular coloured dye.

The Japanese soon copied all these Tagal braids and quickly made it almost impossible for any other competitor, although at first their reproductions were extremely faulty. While Italy, that also made hemp plaits, and Switzerland yet enjoy a small trade, it is probable that at least 95 per cent of Pedal Tagal emanates from the "Land of the Rising Sun," which has found means to utilize other varieties of hemp, and has also incorporated silk fibres into the plaiting, and at the same time is now producing qualities that are not surpassed by either of the European varieties. The only merit of continental Tagal above the Japanese is that the braids are somewhat firmer and squarer in make.

Hemp fibres, like almost all others, have been extensively used, either by themselves or in conjunction

with other materials, in making fancy braids of a thousand and one varieties. One feature of all Tagal plaits is that there is no other known medium which combines such toughness and wear-resisting qualities.

Further, plaits have been made from the naturally produced vegetable fibres, Raffia, Cuba Bast, Yedda (a particularly light stripping from an exotic plant), Sinnet or Palm leaf, Rushes of all kinds, and various similar growths.

Mechanically prepared fibres from vegetable growths such as cotton, jute, etc., have been pressed into the making of various braids of close and open designs, while silk and imitation silks of cellulose nature have enjoyed great popularity as plaits for making fancy hats.

The only purely animal product used in making plaits is horsehair. This material, so extremely liked by the highest classes of wearers, is now most difficult to obtain owing to the rise of the motor car and the subsequent decline of the horse, but in spite of its origin it has been, since at least sixty years, included as one of the materials that can be classified as a "straw hat."

All the plaits mentioned, with very few exceptions, such as the cellulose, visca, cotton or black horsehair varieties, require bleaching or dyeing before being ready for sewing. In a few cases these processes take place where the plait is made, but generally speaking they are done at the places where plaits are made into hats.

CHAPTER IV

STRAW HOODS—METHOD OF PREPARING AND OF WEAVING THE FIBRES

THE previous chapter has dealt with the materials used in plait and the incidental processes necessary to the preparation of the fibres, because plait is undoubtedly at the present day the principal medium for the fashionable straw hat. As the opening chapter proves, the earliest periods of the use of vegetable fibres for head coverings were entirely devoted to the weaving of the hat in one piece, as, for example, a basket is woven. In fact, the use of plait braid has been adopted only for about 400 years, but, although large quantities of woven hats still continue to be made, plait has gradually taken the premier place. But any description of the straw hat trade would be incomplete without a proper account of the woven hat or "hood," as it is termed in the trade, the word "hat" implying the finished article. In the first place the fibres that can be made into plait can also be made into hoods, for any fibre capable of being manipulated in plaiting can be woven. (The term "woven" is used in want of a better, because the action needed is really more what is generally known as "weaving" than "plaiting," although both processes are done by hand, with one or two minor exceptions.) There are, however, several fibres that are woven into hoods that are not generally utilized for making plaits, although quite suitable, but their nature is such as to demand a different preparatory treatment to any of those essentially straw. These are the "Panama" and the Panama imitations or substitutes.

Among the substitutes are "Curaçoas," "Bowens," "Jipi-Japas," etc.; and the imitations are "Javas," "Bankoks," "Brazilians," "Manilas" and "Paper Panamas" made from strips of paper rolled to imitate, and they do imitate very closely, the natural fibre used in the real Panama. A description of the true "Panama" fibre will give an insight into the nature of all the substitutes, the preparations for weaving being nearly identical in every case. The origin of the Panama hat is obscured in oblivion, but the source of supply ranges round about Central America, and from Ecuador claims are made that in the province of Manavi, a native named Francisco Delgado first made a Panama hat about 300 years ago. This very Spanish name for a native evokes a suspicion that the date given was the first *Spanish* record of the matter, for it is most probable that the making of grass fibre hats in the Western Hemisphere was, like it has been shown to be in the Eastern, of the most remote antiquity. But researches made by our Consular Office can only supply the above information. The material used is derived from a kind of native palm or palm grass known as *paja toquilla*, and resembles, in its fan like shape, the *saw palmetto*. Cultivation usually takes place in selected low-lying wet lands, and the seed is planted in rows during the rainy season. When the grass attains a height of $4\frac{1}{2}$ to 5 ft., it is cut just before ripening, boiled in water, and after being thoroughly dried in the sun, is sorted through very carefully. The actual selection of fibres for the best class hat is most thorough, and all unlikely leaves are rejected.

Those finally selected are in some districts, such as Manavi, dampened with water to make them tough, pliable, and amenable to stripping into the required widths. In Columbia, where the "Palmicha" is used,

the leaves are boiled for a certain time till they soften and turn a light yellow in colour. This process of boiling is an art in itself, and seems to present greater difficulties without corresponding advantages to the simple damping. The leaves done by either method are then separated and hung to dry in a current of air, but not in the sun. Before they are quite dry the splitting operation commences ; this is still done in some districts in the primitive method by the thumb-nail of the operator, in others a Y-shaped wooden tool is used. The splints, when being split are made to curl slightly at the edges, causing the fibre to assume a roundness. The subsequent drying causes this roundness to become permanent. They are then made into suitable bundles, and wrapped in clean damp cloths to protect them from the dry atmosphere as well as from the light. The hood weavers commence at the apex of crown and continue the weaving in a circular and transverse manner, until the edge of the brim is reached, when a double " return " is made to give strength and form to the hat. Some centres use wooden blocks, on which the hood is shaped during its progress of weaving, others follow simply the primitive method of rule of thumb, but during late years the demand for larger head entries to Panama hats has caused a more general using of either the wooden block or a suitable template in order that the size of the crowns may be more uniform.

In some places the various parts of the hood are made by different operatives, thus the crown or the top only may be woven by one, the side of crown by another, and the brim by a third ; generally there are two.

In order to achieve the best results the weaving has to be done in a very humid atmosphere, and to take advantage of that condition, and to ensure continuity,

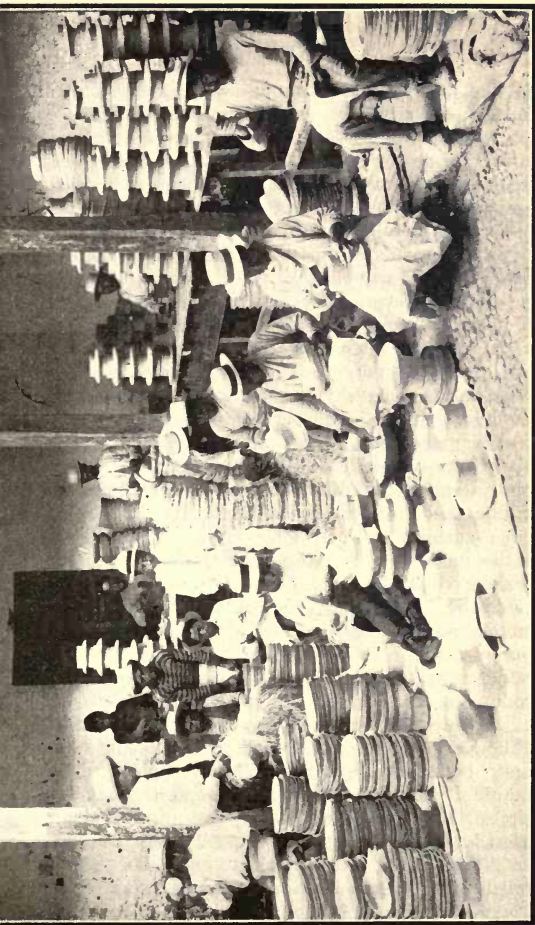


FIG. 7
PANAMA HAT MAKING—TYPICAL OF WORK ON ALL WOVEN STRAW HATS

the work is sometimes accomplished between midnight and 7 a.m. during the dry season. Some writers on this subject assert that Panamas are woven *under* water, the operator using a bowl ; some *may* have been, but this was probably a freak experiment, as in all the many districts where hats of this kind are made the only desideratum is full natural humidity. When the hood is finished the ends or "speels" of the strands, where the *setts-in* and the *setts-out* take place, are carefully pared off with a sharp knife or scissors, and the hat is battered all over with a small wooden mace in order to make it as smooth as possible. It is then washed, in some places with clean cold water only, in others with soap and water, and in some with soap and water combined with lime-juice ; drying in the sun completes the operations of making the hood. What are here known as "Jipi Japas" are so closely allied to the true Panama that only an expert can differentiate between them. The material used is almost always identical and is prepared in the same way. There is, however, a slight difference in the method of weaving, and the finish generally speaking, is not of such a high standard. They are made principally in the province of Manavi, in Ecuador. Another variety, very similar, taking its name from the district in which it is made, is called "Suaza." The really fine specimens of the Panama hat appear to be produced in Columbia, and are made in the departments of Santander, Antisquia, Cauca, and Tolima.

The local generic name for all these hoods is "Jipi-Japa," but the name "Panama" was applied to them because Panama was the port from which they were shipped, and this name for the best quality obtains generally throughout the world. A really fine hood would take two or three months to make, but the bulk probably do not exceed two or three weeks' work. Some

districts look to the making as regular employment, and the operatives work the whole available time in the day, while others regard it as a side line, and utilize only their spare time. A very similar arrangement to this was common among the straw plaiters of England, and in both cases the bulk of the workers were women. Latterly in the Central American States men have been more employed in the industry.

The "Curaçoa" (or as it should properly be spelt Curaçao) comes from the island of the same name in the Caribbean Sea. When made the hoods are of a light creamy fawn colour, and are made out of fibres imported from the neighbouring mainland of Venezuela. The method of weaving is similar to that of Panama hats, but the strands are of a much coarser texture.

"Bowens" or "Pandans" are made principally by Chinese labour in the island of Sumatra. They are generally, although some are of split fibres, made of a whole natural raffia-like grass which is indigenous. They are extremely low in price, and although coarse looking are very serviceable hats. When properly bleached, after going through a variety of chemical colour changes, they assume an excellent white.

Another variety of hood, of which only a limited quantity have been used, owing to its many undesirable features, is the "Hinoki." This is made of Chinese raffia by native labour, and is similar to the "Bowen," but the nature of the fibre is such as to make it decidedly inferior among the Panama imitations. "Javas" are perhaps the most peculiar and wonderful in their working. They are made of perfectly flat splints obtained from bamboo-like palms, and are woven in all degrees of fineness, but their great peculiarity lies in the fact that they are double, the hoods when marketed having a finely woven exterior and an inside lining much

coarser in texture attached only to the outer one at the edge of the brim. At one time they commanded a large trade, but demand for them has greatly diminished in Europe. "Bankoks" are similarly flat splint hoods of one thickness, but the fibre of which they are composed is an inner one, the outer and harder portion being taken away. They have the merit of extreme lightness of weight and can be successfully dyed in any colour but with little sheen. "Brazilians" are not unlike "Javas," but are of one thickness only, and the fibre used is more stubborn than that of the "Java."

"Manilas" are also woven in like manner to a Panama, but they can be obtained both single and double like a "Java." The fibre used for them is hemp, the "splints" of which are fine strips of two or more strands of hemp laid flat. This variety of hood is capable of being dyed to any colour, and unlike either of its *confrères*, has a brilliant sheen when finished. All these "imitations" derive their name in some way from their places or ports of origin.

"Paper Panamas" are the latest Japanese production, imitating some models first made in France. By appearance alone they can hardly be selected from the real article except to experts, it is only the difference in weight and greater regularity of colour, that discloses their nature. But they have not the same wearing capabilities, for while a real Panama can, and often does, last longer than its wearer's lifetime, the sham one is nearly worthless after the first season's use.

Other hoods are made of "chip" (generally of wider splints than those used for making plait); of "rush," "yedda," "raffia," and other similar materials, in fact each succeeding season generally sees some novelty of fibre introduced. Of rush hoods there are two varieties, one of the fine, rather hard, but very tough rushes

that usually grow in England by the wayside ; these are made in the greatest quantities in China, and wonderful ingenuity is displayed in their finish. The other variety is that of the pithy "rush" such as one may gather in the Fens, and which is to be found in quantities in the Lombardy marshes ; these are used for making both plait and hoods which are very light in weight.

"Yedda" is the inner cuticle of an exotic plant, which has great toughness and is very light in weight, but, owing to the growth of the plant, can only be obtained in very short lengths, this of necessity making both plaiting and weaving more difficult.

"Raffia" is the substance known to gardeners, and makes an excellent medium for plait and hoods on account of its lightness, its toughness and the great length of its staple. There are other natural fibres that have been utilized for hood weaving by hand, but the above-mentioned are the principal ones. In addition there are some hoods made of machine woven plait of hemp, cotton, silk, or imitation silk fibres. Although the first named is frequently worked alone, the others are generally woven with other materials. A hood of straws machine woven with the aid of a cotton, hemp, or silk fibre emanates from Switzerland and Italy, and is extremely light in weight. Sometimes the straws are utilized whole in these hoods, but more generally they are split. In both cases the straws are dyed or bleached before weaving.

All these hoods are utilized for making men's or ladies' hats, and except in a few cases they are imported in the natural colour, requiring bleaching or dyeing before entering the actual hat making process.

It is perhaps necessary to add that hoods of splints cut from palm leaves imported from Cuba, were made during some years at St. Albans. The result was similar

to a "Brazilian" (in fact, they went under that name), being woven by hand in the villages round the city, and blocked into proper shape and trimmed in the St. Albans factories. The trade languished when French competition arose, Strasburg and Nancy being the most successful European competitors. "Panamas" or hoods made from the fibre imported from the West Indies have also been made in these last mentioned centres.

CHAPTER V

STRAW PLAIT AND PLAITTING

HAVING briefly described the nature of, and method of preparation of various plaits and hoods, some detailed account of the method of working those which have largely contributed to the creation and augmentation of the Straw Hat Trade will be necessary.

The first plaits made were, as has already been said, of *whole* pieces of rush or straw. They were plainly plaited without any attempt at producing what is termed a "head," i.e. the straws or rushes were simply folded over flatly at the edge of the plait. Plaits were made of varying numbers of "ends" or pieces of straw, from three to seven was probably the favourite scale. The "ends," let us say three, are fastened together by twisting in a fanlike manner, the right-hand one is first bent under towards the left in a flat fold at a widish angle, *under* the middle "end," this then becomes parallel to the left hand "end" which in its turn is folded under the now middle end towards the right, becoming consequently parallel to the right-hand "end"; this completes the operation, which to make lengths of plait is repeated *ad libitum*. The plait produced is now known as "3 ends plain." To make a "head" on one edge of the plait, instead of folding flatly from the right, a "twist" or half turn is given to the "end" at the extreme edge and point of turn, before folding under the middle strand; as this always to a certain extent buckles the round pipe of straw or rush, a shell like effect is produced which greatly adds to the effectiveness

of the plait, and is called "Twist" or "Picot" edge.

To make "five ends" plait, five strands are required; these are also set out in a fan like shape, but four of the ends lie parallel towards the right, and one only towards the left; the plaiting begins by turning with either the twisted or the flat fold, the right hand "end" *under* the "end" nearest to it, *over* the next one, and *under* the third, when the left hand "end" is turned *under* the one just brought from the right, which then becomes the left hand "end," again beginning with the now right hand "end" and repeating the operation as before. These two processes form the basis for all plaiting, and although any number of "ends" may be used up to the holding capacity of the plaiter and although any change of making the "head" may be adopted, the *under* and *over* method is common to all plaiting of braids and hoods. The demand for novelty has caused many variations to be created; the "Twist" head has been described, in addition there are the "one" "two" or "three" or even more "Purl" (or "Pearl") heads. A "Purl" is a double kind of "Twist" which may occur at every other head or greater intervals. This twist consists of two of the strands or split straws being turned spirally for a sufficient length to form a little half shell at the edge of the plait, the further length of the strand being plaited into the foot at the desired distance, giving to the finished braid, which is generally of a narrow width, a very pretty effect. Another variety of head which has different applications of the same principle is known as "Feather." This, although it can be made with whole straws, is generally, and is most effective, made with split straws, and its pattern is a loop or loops of a slightly curved nature formed on the edge of the plait by allowing the

right hand "end" or "ends" to miss one or more turns of plaitting, so that when at regular intervals it is, or they are, loosely brought into use, they will form a kind of scalloped edge to the plait.

There are also heads which are known by the number of times plaitting is *missed* to create a fancy edge. These vary from two to ten, and are made from a sufficient number of "ends" to leave the head of "Under-two" or "Under-ten" or intermediate numbers, as the case may be, with a sufficient "foot" to keep the plait firm for working; the resultant appearance of this method is a plain succession of parallel straws at the plaitting angle to the "foot," which gives, when sewn, the "foot" being covered, according to the medium used, an entirely "matt" or a brilliantly glossy surface. These "under" plaits can be made with any reasonable number of "ends," but they are seldom found plaitted with more than sufficient to produce the "under ten." In order to preserve absolute regularity of length in these head straws, which are actually "in the air," they are turned over a suitable template, be it of bone, metal, or any thin hard wearing material; this is withdrawn as the plaitting progresses to the further stages of development, but in some cases, especially with split straws, which would not retain any regularity without some support, the template used is a strand of split straw of sufficient width for the number of "under heads," and is left in the plait to form a permanent strengthener to the pattern. It is completely hidden from sight by the heads folded over it, and although in the wider plaits it is very undesirable, being extremely difficult to turn in small circles, in the narrow grades the objectionable features are more easily overcome.

In addition to these, there is the "saw" edge, a peculiarity of "Rustics," and of which, as its name

implies, one edge, or both edges, present that angular serration which is common to saws. There are also innumerable fancy edges, having as their foundation one or the other of these generic patterns.

The "Foot," or other part of the braid as distinct from the head, is made in so many ways that room forbids any detailed account: some plaits have none, and one of the most remarkable of this variety may be described. In "English Brilliant," a widish plait made of a varying number of ends, there is really no "foot," the plait, of split straws, being all head or pattern. The individuality of "Brilliant" is that once the turn is effected the split straw instead of laying flat across the pattern is made to stand on its edge, giving to the design a look similar to a honeycomb; this is probably the lightest in weight of any straw made plait.

These few types form the basis on which nearly all plaits are made by hand. There are, of course, many others in actual use, one not yet mentioned which, although plaited in the same way as ordinary flat head 7 end braid, is made with single strands of split straw. The result is a kind of chess board pattern, which shows alternate squares of the outside and the inside of the straw. This has a generic name of "split," and was one of the earliest developments of English plaiting. Naturally, it is very light in weight, and enjoyed a great sale for many years, being most suitable for "Granny" bonnets.

Other plaits have been made of what is called "Cordinette." This consists of two strands only, and is plaited one over the other in recurring fashion, so as to make a kind of narrow concertina. It was at one time used for making small bonnets, but its general application has been for the embellishment of some of the wider grades of plait.

The straw plaits of China, and especially Japan, are all made on the above lines, their extra beauty and lightness, combined with the width of straw possibilities, rendering them the successful rivals to our insular produce. In these Far Eastern lands many fancy digressions of plait making have been made, some of them of beautiful design and effect, but all of them embodying one or more of the methods already described as peculiar to hand plaitting, and generally speaking have been copies of patterns sent out from Europe.

The other branch of plait making that has now revolutionized the trade is that of machine made braids. Some few entirely straw plaits have been made by machine. A Luton inventor named Barrett designed a mechanical plaitter, which really did make fairly good whole straw plaits, but the invention came at a time when lightness was considered most essential, and the machine failed to do justice to either single or double split straws. Italy has for many years produced a straw plait woven with cotton or silk, of which there are many patterns, but which are all given the generic name of "Fiesole," from the original place of manufacture. This Italian plait of fine Tuscan straws has been in use for many years, 1840 is supposed to have been the date, and the plait was made on looms imported from Switzerland. Both Italy and Switzerland have since produced innumerable patterns of plaits in which straw is combined with one or more suitable weaving media. But all these machine-made patterns, although legion in number, and extending over more than three-quarters of a century, cannot compare as a straw hat success with the machine woven braids of horsehair, cotton, silk, viscose, hemp and other similar fibres that have emanated from Switzerland, Italy, Germany and Japan.

Probably the first machine-made braid (soon adopted and classified as "straw") was that known as "crinoline." This has as its basis horsehair, and is made both of hair alone and of hair mixed with many other fibres. The plain braid can be composed of odd numbers of strands of horsehair from five upwards, in series of numbers divisible by four, plus one; thus 17 ends, 21 ends, 25 ends, and so on; the finest used in the trade is 17 ends, which is about $\frac{1}{8}$ of an inch in width, but 21 and 25 ends are the most in request for making the *Crinoline* hat so well known in the most fashionable quarters. Bonnets were extensively made about fifty or sixty years ago of "Crinoline Fancy" plaits that were a mixture of the hair with silk, or straw, or Tuscan, or any similar fibres. They were also adorned with glass beads or bugles, and with silken knots and small tassels. This trade is now nearly extinct owing to the scarcity of hair, but its place is fully filled with imitations made of various kinds of artificial silk, cellulose, viscose, and the like.

A cheaper competitor to crinoline was brought out about 1870, when imitations in cotton fibre braids were put on the market, but these missed entirely the delicate open work of the real article. Similar effects were subsequently made in hemp. But about 1890 the Germans began to make cotton braids in an open, or as it was termed *ajour*, manner, imitating very closely the true effect of crinoline. This had a tremendous success, for the cost was very small. This was followed by the silk imitations mentioned above, and they have now reached such a stage of perfection of make and colour as to entirely outvie their progenitor. About 1892 the Swiss people put on the market the first "Tégál" braids, to be quickly followed by an Italian copy. This rapidly spread to Japan, and the product of

that far eastern country soon took the premier place, which at the time of writing it still holds.

Another product, largely used in the trade, although strictly speaking neither a plait nor a woven hat, is "Sparterie." This is wattle woven of fine willow-chip splints into various sized sheets for the different requirements of the trade ; it is mainly used as a foundation for making hats to be covered with some delicate plait that will not stand any method of wet stiffening. It is extremely light in weight, and can be moulded to almost any shape, it will stand stiffening, and may be made as firm as stiff buckram. This emanated first from Italy, but now for some years the Japanese have been competing for the trade.

CHAPTER VI

DYEING

THE dyeing and bleaching of the various plaits are the next important processes towards making a straw hat.

The dyeing of straw plait in England, done individually for some time on a small scale, commenced as a separate industry about 1845, when a Mr. Randall opened some dyeing works at Sundon, a village about four miles from Luton. Black, and a very poor brown and dark blue, were the only colours then dyed. Shortly after Mr. Thomas Lye, who came from Kirkby Malzeard, near Ripon, Yorks, which was a plait making centre, started business as a dyer in Luton. His gamut of shades numbered only four or five, and the standard of colour then demanded was very low. Mr. Lye's first signal success was a "grey," which at that time no other competitor had attempted. In 1857 his business was transferred to its present site. Other colours quickly followed, and the invention of aniline dyes revolutionized the old "vegetable dye" processes, of which the ingredients were madder, indigo, logwood and fustic. These wood dyes required a long and costly process, and involved the use of mordants to prepare the straw for the different colours, and their somewhat cumbersome methods rendered them at all times rather uncertain in their results. With the advent of the more easily handled synthetic dyestuffs the operations of wood dyeing became less frequent, and although to-day black is still produced from logwood chips, practically all colours are dyed with one or the other extracts of

coal tar, etc. The main considerations of dyeing are brilliance of shade with perfect evenness of colour, and penetration of the dye right through the straw. Unlike some textile fabrics, fastness either to light or even to water is not insisted on ; but absolute penetration is a necessity, for should any part of the straw when plaited become abraded, if the colour were only on the surface, the worn part would show a lighter tint ; and also if when the " button " or centre of the hat was made, the turning of which being in such tiny circles, the straws are disturbed to their utmost, and the light coloured spaces which would result would impair the regularity of colour. And the dyeing penetration of straws or straw plait, composed as it is of such diversity of elements, the hard flint like exterior and the soft pappy inside, is a matter of considerable difficulty, even if dyers had not to contend, first, with the extreme hardness of water which is common in the South Bedfordshire district, and second, the constant cleansing necessary on changes in fashionable colours necessitating the use of coppers, the chemical effects of which in some instances need counter action to achieve a good result.

The question of penetration of the straw is one that has keenly exercised the minds of straw dyers from the inception of the industry. Many are the opinions as to the best medium for rapid and regular penetration. And many are the formulae given as being most suitable agents. It is probable that straws, grown on different geological formations and thus having different varieties of silicate exteriors, require different baths of softening chemicals, and that one bath, excellent for the straw plaits of China, would be inefficient for the straw plaits of Italy. Generally speaking, however, these baths are formed of water with some neutral salt, such as *sodium acetate* ; or of an alkaline solution of *sodium*

carbonate with *ammonia*. But the less that is done in the way of such softening before dyeing the better ; because the longer straw plait is boiled the more it is impoverished. And as these preliminary processes involve boiling in every case, impoverishment must take place, and where alkaline solutions are used the results are especially poor. Another objection to the use of softeners is that they tend to loosen the straws of the plait, and as each process involves manipulation, the handling of the loosened plait tends to break it considerably.

Yet another objection is that certain shades of colour are most adversely affected by the previous use of such agents, in fact some tones cannot be produced at all on plaits thus treated. While in a few cases it is perhaps necessary and advisable to employ a softener, in by far the greater number the best results are those obtained from that formula which involves the fewest processes and the shortest time of boiling, and this can best be obtained where dyestuffs are used that do not require any previous preparation of the plait.

The dyeing of straw is almost invariably done at the boil. The dyeing matter, with any necessary addition, is put into the vat or copper and well mixed with the requisite amount of water. The plait is then introduced and laid carefully and regularly so that when pressed down the solution may cover it.

The vats (which are made of wood) and the coppers are all furnished with a steam perforated copper coil at the bottom. Over this at a slight distance, so that the heated pipes cannot come into contact with the plait, is laid a perforated tray, be it of wood or copper. The plait is laid, as described above, on this tray, and when sufficiently pressed down is covered with a perforated copper lid to prevent the plait from rising above the



FIG. 8
BLEACHING AND DYEING OF PLAITS AND HOODS

surface of the dyebath. This is then brought to the boil and continued for sufficient time, according to the nature of the material and colour required, to ensure perfect penetration and regularity. This time may vary from even less than twenty minutes to several hours. When the desired shade is achieved, which is proved by testing, the plait is lifted carefully from the dye bath on to a crated topped carrier, similar to a funeral bier. Formerly on arriving at the drying shed the plait was put on rods and thoroughly shaken to cast off as much moisture as possible, and then hung in the air so that the drying might not be too rapid and thus render the plait brittle. Now the plan is to place the plait, when taken from the copper, in a centrifugal wringer or "hydro-extractor," which, revolving at great speed, throws off all free moisture and leaves the plait almost dry. Placed then in a chamber with large power-driven fans, the drying process is most speedily completed.

Before dyeing, for easy handling, all plait is "strung." Every piece of plait is received either wound up in "sticks," as they are technically termed, or in some looped formation which allows a fine string to be easily threaded through and tied in such a manner as to form a means of either carrying the piece or of hanging it on a wooden rod. These rods are made of convenient thicknesses and length to carry the plait in the drying departments (be it in the room, or in the open air), when suspended either in the former case on trestles mounted at suitable distances, or in the latter on lines fixed to uprights and stretched across the drying area. Each lot of plait for dyeing carries a numbered wooden "tally," the number corresponding with the dye ticket left in the office or "giving out" room. When dry by means of these tallies, the plait is collected into its

original lot, and is carefully tied up in suitably sized bundles. Some plaits receive, when dyed, a "finish" of a glucose mixture which has two effects, it gives better gloss to the material and it assists in preventing the colour coming off during the manufacturing processes. These mixtures are all of a starchy or farinaceous nature, in which some substance, say "farina" itself, is dissolved in water, brought to a boil and rendered crystal in appearance before being used for the finishing process.

Some plaits are of one colour throughout, but are made with straws that have been previously dyed. Generally speaking, especially for straws, the effect is not so good as where the plait itself is dyed. There are, of course, one or two exceptions where the fibre used is very delicately plaited into some loose design which would not retain its crispness of outline under the weight of water in dyeing and the necessary handling. Other plaits known as "Speckled," must, from their nature of mixed colours, be plaited from dyed straws. Of these there are coloured and natural, coloured and white, and mixtures of various colours. The dyeing of straws follows in the main the dyeing of plait, but the preparation is somewhat different. The straws, cut into equal lengths, are tied up in bundles about 5 ins. in diameter, and are carefully placed in the vat or copper in an upright position with as little pressure as possible, and when dyed are dried still in the bundle. At one time a new dyeing effect on straws was introduced, which consisted of standing the bundles upright and allowing strong dye to run through the "pipes." This, of course, dyed the interior and some parts of the exterior, which not touching another straw allowed the dye to do its work. Water was then passed through the "pipes," and the result when dry was a pretty mottled effect. Another fancy method of dyeing was the production

of "Ombé" colours. This novelty, introduced by the French dyers, consisted of two or more colours on the same plait. It was done by means of a fine spraying machine, which vaporized a powerful dye on to an already dyed piece of plait of some lighter tint. Messrs. Lye & Sons brought out a novelty on straw plait, particularly effective on the Japanese wide patterns, which produced the same iridescent effect that is obtained on "shot" silk. This, however, was bath-dyed and not sprayed. These various bases of double tones were utilized to their undoing, for it was no uncommon sight to see manufacturers of the lower grades of hats endeavouring to produce multicoloured effects on chip plaits by pouring the prepared dye over the plait from finely nozzled watering cans! The resultant crudeness of such arrangements brought a beautiful thing into disfavour. The shade requirements of to-day include many colours that are termed "Pastel." These are delicate, pale shades, and can be obtained only by submitting straw plait to a bleaching process previous to dyeing, but the finished article is a thing of extreme beauty, not only on the question of colour, but in its intense purity and softness. A method for dyeing plaits, which obtained considerable magnitude in Paris, but has never been a favourite in Great Britain, is that known as "Cold Dye." It enjoyed only a small measure of success on straw, but on chip and hemp braids very beautiful results have been achieved. In 1877 Mme. Deuxbouts, of Paris, was dyeing chip plaits in this manner, which is that used for feathers, and in 1878 at the Exposition Universelle, her exhibit in this direction was superior to that shown by any other house. It is now used for dyeing crinoline and those silk plaits which would be spoiled by heated baths.

Such are the main features of dyeing, past and present,

on the various plaits utilized in hat making, and in this art, for it is no less, England has shown the way to the rest of the world. To-day other countries, such as the United States, Switzerland, Germany, Italy and Japan, have achieved signal success in dyeing, in fact on some fibres a few foreign dyers are more successful than those at home. This is probably due to the careful skill of the dyer, combined with the more favourable nature of the water used.

CHAPTER VII

BLEACHING

THE other section of preparatory work for plait is that of Bleaching. The early efforts in this direction were of necessity very crude, and it is probable that imitation of the process used in some other industry, rather than invention for the particular commodity, provided the primary steps in straw bleaching. Naturally, the first thing that would occur to anyone would be to wash with water, and any grower of cereals, knowing the bleaching power of the sun, would probably combine these two elements in the endeavour to produce a better colour on the corn stalks. Then some attempts would be made with a cleanser such as soap, still utilizing the sun's rays as bleacher after cleaning. As Italy is probably the home of bleaching operations, it is not difficult to imagine that, with the sulphur bleaching effects so easily seen round the Bay of Naples and in Sicily, it was not long before the fumes of sulphur were pressed into the service. And crude as these elements are, although the processes have radically changed, they remain practically the fundamentals of bleaching to-day.

About seventy years ago, Mr. Welch, of the firm of Welch & Sons, of Luton (one of the oldest established houses in the trade and still in existence), patented a bleach which was called the "Luton Bleach." This consisted of carefully washing the plait with soap and water in wooden vats; after careful rinsing it was immersed in a bath of weak oxalic acid and water (some bleachers subsequently added other chemicals), and

then while wet subjected to the fumes of sulphur in a hermetically closed wooden chest. Hanging out in the sunshine to dry, and another sulphur fumigation before "bunching" (as the tying up of plait into bundles is termed), completed the operation. With chip plaits, and fifty or more years ago these were very fashionable, a similar process was usual, but the bleaching bath contained, as well as oxalic acid, kali, tartar, and a good many other similar ingredients, according to the requirements of the user. In those days nearly all bleaching was done by the actual manufacturer of the hats, it was only when the trade began to move by leaps and bounds that works entirely for bleaching purposes were established. For many years these methods of bleaching were the only ones employed on plaits for hats, and they produced excellent results on really good coloured straws; but failed entirely to eliminate any faulty parts, and further, in order to get the finest colour, two more sulphur fumigations were necessary; one when the hat was wet from the gelatine employed to stiffen it, and the other a dry "steam" (as the fumigation was called) before putting the finished hats into the cases for dispatch.

This custom of bleaching, in a patriarchal way in one's own tent, brought out considerable inventiveness on the part of go-ahead manufacturers, and it was no uncommon thing for some fresh development of bleaching, on one or another plait, to establish the reputation of a manufacturer, who, until his secret leaked out, endeavoured to exploit to the full the value of his superior article. But this kind of bleaching only cleaned and purified, it did not materially alter the natural condition of the article bleached. In the first place manufacturers were not laboratory chemists, and it was the efforts of the Italians, the producers of the

plait which was supplanting the British product, that gave birth to a chemical bleach, which for some time was unrivalled in England. For some years the bleached Italian Pedal of Messrs. Burgisser & Co., of Florence, had no superior, and was for a long period renowned for the purity and beauty of its colour process. But the secret subsequently leaked out, and bleaching establishments in this country soon acquired them, and it was not long before the results obtained here compared favourably with the Italian. For some years this bleach, which not only cleansed and purified the straw, but also changed its actual tone by bringing more into colour line the straws of darker hue, was accepted by the world as the best possible ; and one may say that, although later developments have considerably widened the scope of operations, the results of this period, which may be called the intermediate cycle of straw bleaching, were in their way quite equal to any now achieved. The only drawback to this bleach was that really inferior coloured plait could not be made serviceable for white. In the case of chip splints or in the case of cornstalks, only the best and clearest of either of these had been used for plaits for bleaching. This necessitated keeping two stocks of plait, for although the best coloured plait could be dyed black or other shade if necessary, the bad coloured straws could not be bleached, and further, one always had to pay more for the best coloured goods, which although to some extent this is even now the case, owing to the great possibilities opened up by the present bleaching processes, there is not the wide difference in price there used to be.

But at last competitive chemists discovered that the quantity of straw plait required for bleaching was of such magnitude, while the really good bleaching plait was comparatively so small in quantity, that it

would be worth their while to make researches in the direction of a bleach for inferior coloured straws. Between 1885 and 1890 many experiments were made, with naturally variable results. It must not be overlooked, that plaits were still required by the trade to be of a "straw" colour, and the first efforts of the "new bleacher" were towards this end. But the process that gave most promise being actually an oxydization was more in the nature of a dye than a bleach in one respect, viz., that it apparently changed the nature of the material, in fact some of the bleachers to differentiate in the trade between the new process and the old called the later arrival a "White Dye." It was soon found that an extended application of the process would entirely eliminate the varying tones of mixed "Punta" and "Pedale" straws and would make the plait a perfectly dull white like paper, but at the same time it tended to materially injure the fabric of the straw. There was naturally no demand for any such results, the "paper white" could easily be obtained on "chip" plaits, and the only effect required was to reduce mottled coloured natural plaits to sufficient uniformity of good straw white colour. Moreover, the absolute "deadness" of the white produced took away all the beautiful lustre of the straw which it was desirable to retain; and the weakening of the fibre by the chemical process was entirely inimical to the subsequent proper sewing and finishing of the hat.

However, a process was found that met all requirements as far as lustre and strength were concerned. There was still a tendency to kill the straw colour, but subsequent investigations have reduced that to a minimum, and to-day the bleaches on straw plaits leave nothing to be desired.

As far as chip and Tagal plaits were concerned there

was not the occasion to preserve the natural colours of the fibre. White chip was always required "paper white," and although some of the hemp fibres of Tagal were of a flaxen colour, most of that exported from Japan was distinctly on the white side, and, therefore, from the first, this process of bleaching has been helpful to all plaits made of these two materials.

Moreover, the modern methods are especially adaptable for hood hats, inasmuch as the process dispenses with scrubbing by hand. To Panamas, although previously the colour had been fairly good, the new bleach has been a great help, and has enabled Panamas of fine colour to be universal.

These remarks apply also to the other varieties of Panamas of which, although the method of making may be slightly different, the fibre is almost identical; but when one comes to the Bowen or Curaçoa hoods, their substitutive use has only been possible because of the searching effects of the new process. Before bleaching, these articles are quite unfit to sell for white, and their natural tint is not one that would command a fashionable sale. Since being dyed white, the demand for them has been phenomenal, and for a low priced, coarse-looking hat of a Panama nature, there is at present nothing to take their place.

The natural colour of Javas, Brazilians and Bankoks is such that they are saleable as imported, but although many are thus used, the great majority of them required for white are bleached by the new process, and with very excellently clear results. Javas, being the darkest of the trio mentioned above, can have their colour retained to some extent, giving the finished article almost a perfect straw tint, but Brazilians and Bankoks assume a whiter tone without any tinge of yellow. They, therefore, are very similar to Panamas in colour

appearance, but both of them, being made of flat splints, are lighter in weight.

Yedda, rush, and raffia plaits and hoods are all very amenable to the bleach, and while the two latter present, when bleached, little, if any, lustre, the first named assumes a silky appearance which is most effective.

To sum up, with the modern process, of which there are several modifications, any kind of fabric used for straw hats can be successfully bleached into one or the other tones from straw to paper white, which are regarded as necessary for the highest grade finish.

CHAPTER VIII

BLOCKMAKING

A MOST important part of the industry is that which actually forms another trade in itself, viz., that of blockmaking. Every shape requires its individual block of wood, iron or other material, in order that repetitions of the shape may be identical in outline and form. The earliest British "block" was that which undoubtedly gave the name to its successors. It was simply a block of wood formed from the trunk of a suitable sized tree, mounted on legs like a vaulting horse, and with ends bluntly pointed to the desired form, so that two operatives could be at work simultaneously. That primitive method was quite inadequate when fashion began to ask for shape variations of such a character as to be impossible to produce on the tree trunk, and an industry gradually grew up, which has attained quite large proportions, solely for the making of wooden and other blocks for the use of the straw worker. The exact shape having been determined on, models either of drawings to scale, or of templates of suitable material, or of the actual hat produced either by sewing the pattern in some adaptable plait, or by buckram or sparterie duly shaped, or by forms of wire bent to make outlines of the design sufficient for the blockmaker. These are the methods adopted when some novelty evolves, of which there is no previous pattern, but the great bulk of models put into the hands of the blockmaker are the actual hats required, that have been already made by some one else, but which the manufacturer desires to copy. As the Patent or

Registration Laws do not afford sufficient protection to the creator of the shape or design, it will be understood that the finished hat is most often the model for the blockmaker.

The blockmaker works in a very similar way to the "pattern-maker" of the iron and engineering trades, the main portion of his work being done by the spokeshave. Bow saws, worked either by hand or machine, cut out the ovals of the crown and the brim, and subsequent operations are carried out by means, in a few cases, of a lathe, but the major part is done by the spokeshave and chisel or gouge. In many instances the intricacy of the work carries the industry almost into the art of wood sculpture, but generally speaking the models are of a plainer nature. Mention has already been made of "one piece" and "two piece" hats. The former may have blocks made "all down," that is with the crown fixed to the brim, which will generally be of a flat or a drooping nature. But the "one piece" in most models demands both the crown and the curler blocks, so that although the hats may be of one the blocks must be of two pieces; this obtains where the brim has an outline which rolls upwards in some place or places, from the base of the crown. "Two piece" blocks are necessary where the trend of fashion demands that the outline of the crown, especially at the base, shall be larger than the head entry then fashionable. For unlike men's hats, the head entries of women's hats vary according to the prevailing style of coiffure, or the outline which most appeals at the time to the public demand. Where in a "one piece" hat the top of the crown is larger than the head entry, the crown block has to be made in such a manner as to allow the block to be inserted in the hat for blocking, and to permit its easy withdrawal when the operation is completed.

This is attained by making the crown block in two or more sections, the pieces being held together by means of grooves and tongues. These are made slightly angled in every way, the end of the grooves nearest the top of the crown being smaller than the end at the base, so that while fitting up very tightly when the tongue is right home, the slightest movement of the "key" piece affords an easy dislocation of the whole block. The majority of these pieced blocks are built up with five sections including the key piece, which is a tapering square and occupies the centre, carrying on each side a tongue which fits into the groove of the corresponding piece of the outside contour of the block. The top of the key piece forms the centre of the top of the crown, and unlike the inner sides and base is made to conform to the required outline of the shape design. The whole when properly made affords quite as solid a ground for working on as a block made from a single piece of wood. If the hat with a crown needing a pieced block is in itself a "one piece" hat, it is necessary to make the brim block in two parts, with a hinge at one cut and a lock at the other; so that the head entry may, when the brim is closed, fit closely up to the head line of the hat, but in all "two piece" hat cases the brim blocks are made out of one piece. As a rule, the brims are made from wood sufficiently thick to allow a little over the width of the brim if there be any depth of roll, or turn upwards, and where the brim is flat or with a small roll an extra thickness is allowed to give sufficient strength to the block and prevent any warping which might be possible under the use of dry and damp heat.

The brim block has on its underside some "feet" which, either of wood or metal, raise the working contour a sufficient height above the wood base to which they are attached to allow the crown of the hat being blocked

to work freely and to miss the top of the "spindle." Every wood block, whether crown or brim, has a square hole in its base called the "spindle hole" to take the "spindle." This is of iron, and has the upper portion square and tapered to quickly adjust itself to the fit of the spindle hole; its lower part is circular, so that it may revolve in the socket made for it in the "spindle" bracket, an instrument fixed to the blocking bench by which any part of the block can be adjusted to suit the ironing needs of the operative.

Wood blocks are made preferably of alder, as that wood resists best the action of dry and damp heads, and having a minimum of grain presents the best medium for cutting into curved or cornered shapes. Poplar, chestnut and other hard woods are also used, either of them having some special characteristic which renders it suitable for various kinds of blocks. The base of a brim block is frequently made of elm, but beech and any really hard wood can be utilized.

Machine blocking necessitates the use of metal blocks, which are cast either in iron, aluminium, or spelter from moulds made from the wooden blocks, so that if only machine blocking is intended, it is first necessary to make the wooden pattern. The various workings of these blocks will be described in the "Blocking" chapter. The wood block also affords the model for taking Plaster of Paris casts. When orders are large and the wood blocks are required all the time by the stiffener or blocker, plaster copies are made from it, so that the sewers may have something definite to work to. These are made in the usual plaster casting method, and are only intended for temporary use, their cheapness and quickness of completion as against the cost of wood being the reason for their adoption, for they will not stand the stiffening and blocking processes.

A subsidiary kind of block, constructed of wood and metal, is used for such parts of a one-piece hat or bonnet that cannot be reproduced in wood alone. The "Pork Pie" turban, in fashion during the '60's of the nineteenth century, had a close curl or brim standing only about



FIG. 9
" TIPPER "

half an inch away from the crown. (See John Leech's drawings in *Punch* of that period.) No wood curler as thin in texture as the shape required would stand any prolonged stiffening and blocking, so instruments called "Tippers" were used for blocking this style of shape. They had a wooden spindle that could be put in the spindle socket, to which a piece of metal, iron, brass, or zinc was attached. This was in the form of a widish, short length scoop, and with it a workman could iron a close brim in sections. These "tippers" were made with varying curves, so that any kind of oval could be reproduced. The advent of two piece hats, where the crown is attached to the brim after blocking, has rendered these instruments nearly useless, as by this new arrangement the wood brim for such a shape can be made quite solid.

Blockmaking is one of the most important sections contributing to the straw trade, for the perfect reproduction of a models' outline depends entirely on the accuracy of finish given to the blocks.

CHAPTER IX

HAND AND MACHINE SEWING

THE next stage in the evolution of a straw hat *made from plait* is the sewing together of the material to form the necessary shape.

The earliest methods were, of course, all by hand. Perhaps the first was that described in Chapter II, where the heads of the plait were tucked in one under the other and rendered secure by the passing of some fibre inside the loops of the heads, so as to make an almost invisible joint, as in the case of a "Leghorn" hat. It may be said in passing that this method was carried out by the Italian plaiters in the case of chip plaits made of 9 ends, but without the securing fibre. The result was that there was enough "hold" given by the tucked in heads to ensure the edges holding together sufficiently to form a perfectly flat plate. It was in this form that chip plaits were first used for the "Granny" bonnets in vogue a century ago; for when stiffened with gelatine or glue the joins were sufficiently strong to enable the brim shape to be produced. The "Flats," as they were called, were made all of one diameter, and it therefore followed that one made out of the finest plait would contain more rows than one made of a coarser grade. The exact diameter was determined by the finest size plait, and of that there would be 100 rows, hence the term "No. 100" represented to the trade the narrowest plait. The qualities down to the coarse ones were graded in 5's, thus the next coarse size was "No. 95," and so on, down even to "No. 65," of which being very coarse only 65 rows were necessary

to make the "flat." To use for working, where dyeing was required, the flat was "stripped" by taking the outside end and gently pulling the flat, the centre of which was pivoted round and round until the whole was undone. This in no way deteriorated the plait, but it was soon found that to wind the plait into neat pieces saved considerable trouble for marketing and subsequent use. This, however, is only a digression recording a method of joining plait in spiral rows, of which head wear was made, which after all is the

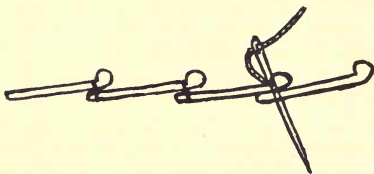


FIG. 10

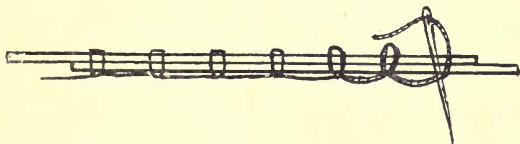
SECTION OF 4 ROWS OF PLAIT

plan on which all sewing is based. The British sewers, with only a very few exceptions, have always joined plaits together by means of an overlap, that is, the head of one row covering the foot of another, thus, the needle passing through the plait just under the head, to make the stitch as little visible as possible, and through the foot close to the edge, so as to lay the plait as thinly as firm sewing would permit. The effect when sewn was of a tiny, practically invisible stitch on the surface of the plait and a continuous stitch on the under side, the stitches being about half an inch apart. (See opposite page.)

This backstitching formed a perfect "lock," and, although for the purpose of explanation the five right

hand stitches are shown in a graduated loose state, in actual working each one was tightened at its completion before commencing the next. This method was common to the sewing of all plaits, the coarser, harsher varieties necessitating the use of the coarsest thread. For some plaits such as fine "split," to be used for "compo" finish, and horsehair crinoline a "running" stitch was sometimes used in the early times, but it has been discontinued except for broad silk or fancy plaits.

As some of the plaits were only about $\frac{1}{8}$ th of an inch in width, it will readily be seen how deft and skilled



. FIG. 11

an operative must have been, to ensure the perfect spirals and equidistant rows that were the mark of the best handsewn bonnets and hats. The nature of the stitch made by any of the machines used for hat making with straw plait is necessarily entirely different to that of the hand, although the one made by the "Légat" machine followed the handstitch very closely. It consisted of two strands of cotton forming a tiny, almost invisible stitch on the surface of the plait and one strand only underneath, the length of each completed stitch being about half an inch. It was made by a descending shaft carrying a hooked needle, and the peculiar result was achieved by very intricate and delicate machinery in a circular box facing the operator. The delicacy of the parts was so great and the machine being less rapid than the "Willcox Visible Stitch," or the first

"Wiseman Hand Stitch," it was soon eclipsed by its competitors.

The "Willcox Visible Stitch" was produced first on what was afterwards known in the trade as the "10-Guinea" machine. This was simply the domestic chain stitch machine, from which the table or platform around the needle had been taken away, in order to allow free working of any part of the hat. In a short time this machine underwent a great change for the straw hat purpose. Luton mechanics set themselves to work, and appliances were affixed one of which rendered the ingress of the plait more easy; another allowed for a minute and standardized gauging of the necessary widths for the proper row-laying of the plait, still further another made it possible to alter the actual length of the stitch, and at last the model known throughout the trade as the "17-Guinea" was universally adopted as the best type of visible stitch machine for plait sewing. The "stitch" consists of one strand of cotton on the surface of the plait and two strands underneath, and from its chain-like nature can be easily undone if required. This has been closely copied by other machine makers, the one produced in Germany known as the "Dresdensia" being almost an exact copy of the "17-Guinea." Both these machines vie with each other in the favour of manufacturers, best work being possible from either. The other model having survived the tests of time and the necessities of the industry is the "Wiseman Box" Hand Stitch Machine. This derives its name from the inventor, and from the box-like case, with even a lifting lid, that is its great characteristic. Mr. Wiseman in this machine, as in his first model, which was not box enclosed, makes use both of the threaded needle similar to the "Willcox," and of the unthreaded hook-like needle peculiar to the

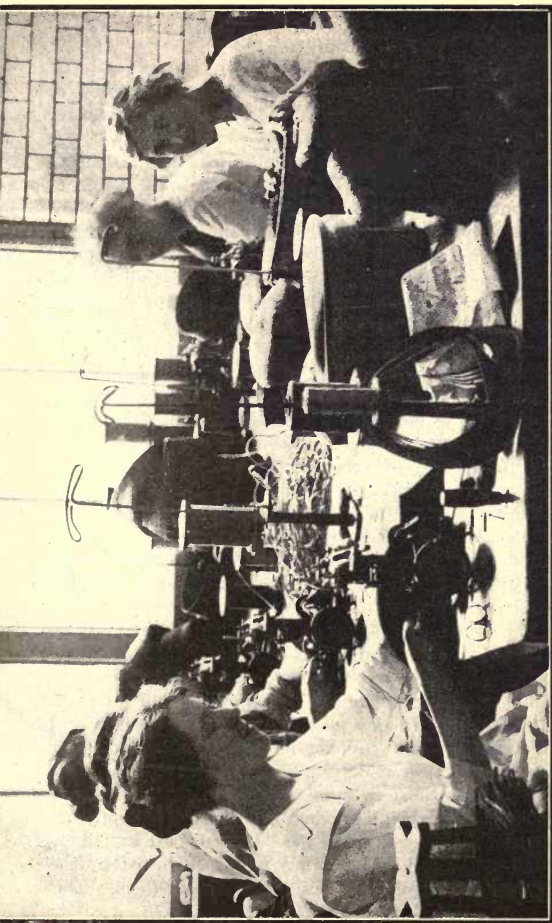


FIG. 12
SEWING STRAW PLAIT INTO HATS BY MACHINE

“Legat.” But contrary to the downward action of the others, the “Wiseman” needles make an *upward* thrust. They stand at about $\frac{1}{16}$ of an inch apart, the one with the eye (which, as in all machines, is at the pointed end) carrying the cotton, and being placed in the same needle bar move simultaneously. The upward thrust when working sends the pair of them through the two overlapping strands of plait which are kept at the proper place by special “guides.” When they emerge on the surface of the plait, a little finger, called the “looper,” takes one strand of the loop of cotton from the needle, brings it across the intervening space where it is caught in the hooked needle and released from the looper. Then both descend, and the result of this trio of movements is a stitch of the width that exists between the needles, consisting of two strands of cotton. The feeds then move the plait forward about half an inch, and the operation is completed. The under stitch consists of three strands, but as the cotton used in this and all other straw machines is of the finest grades, say from “80” to “100” for the best work, the stitch is hardly seen, and the weight is not sufficient to be detrimental.

The centre of the top of the crown, called in trade parlance the “Button,” is produced by taking an extreme end between the thumb and forefinger of the right hand, the left holding the length part of the plait. The right hand makes a sharp turn of the portion held and with a slight cupping motion, such as would be used by a grocer making a conical paper bag, permits the plait in the left hand to come under the cupped portion, through the lapping of which the first stitches are made. The spirals of the “button” are extremely small, and the beauty of this part is enhanced by the gradual and regular increase of the size of them. This

operation produces a spiral going from right to left, as in Fig. 13, and is always the method adopted by hand sewers ; it was in this way that all the bonnets and hats were commenced prior to the adoption of machinery for sewing plait.

The button finished, recourse is then made to the "block" or shape of the crown to be produced, for the subsequent sewing depends on its contour. If this is circular the continual working around the button until the desired diameter is reached, will achieve the required result ; but if the shape is oblong (as they frequently are, the trade name for which is "oval"), it is necessary for the sewing to follow a slightly crowded course at the narrow width, and a slightly extended course at the length, for it is a desideratum that the edge of the top should synchronize exactly with the "turn down row" as it is called, so that with the first row sewn down the side of the crown, a clean cut and square edge will be produced. This done, sewing continues, always to the "block" contours, until sufficient depth is reached, and this finishes the crown where the base is at equal distance all round from the edge of the top. In some cases, however, it is necessary in order to produce the actual outline of the model, to add in one place or another at the bottom of the crown short extra rows of "gores" or "slopes" (the local terms) which will increase the depth of the crown at the place required ; in some bonnets many extra rows are necessary to give just the fit to any arch there may be in the head line of the brim. In early times the bottom of the crown was always the same size in circumference as the head entry of the brim, and in that case the brim was commenced by sewing the first row of it to the last row of



FIG. 13

the crown. In some styles that still obtains, and the hats thus made are designated "one piece." Modern models, however, often have the base of the crown much larger than the necessary head entry. In those cases the crown and the brim are made separate, and are called "two piece" hats when finished, the headfit being provided by the brim alone. In such cases the brim is commenced by sewing to a band of some cheap material sufficiently stiff, made to the necessary head size.

Many shapes have brims which are of equal width all round. It is then only necessary to sew directly off the last row of the crown, and, conforming to the style, continue the sewing in the spiral manner. Where a brim is flat it is most important that it should be started at a proper angle to the side of the crown, for that may or may not be exactly upright. There are crowns, such as boaters for men, of which the sides are exactly at an angle of 90° to the brim, there are others of which the top is smaller than the head fit, of which the sides taper, making an obtuse angle to the brim line; and still further there are others, where the top is larger than the head, where the angle is sharpened. So that in order to make the brim perfectly flat due regard must be made to the side crown incidence, and in process of making great care has to be taken so as not to impart either fullness, which would cause undulations, or tightness, which would make the brim either to turn up like a saucer, or to turn down like a mushroom. Of course, there are hats with brims of equal width all round that are designed to do one or the other of these things, and in that case the operative gives the necessary fullness or tightness either all round or in part as the shape may require. But the majority of fashionable models have brims of unequal widths; thus the front may be wider

or narrower than the sides or back ; or the back may be of the narrowest width ; or the sides may be wider than either front or back, or each cardinal point of the brim compass may be of different dimensions. In either of these cases the proper result can only be obtained by one of three ways : 1st, by the insertions of the proper width and length of gores at the part nearest to the crown and opposite, but in relation to, the edge of the widest part or parts of the brim ; 2nd, by starting the brim at the crown line as if for an equal width, and putting the gores at the edge of the brim at the place where the extra width is required ; 3rd, by sewing the brim as an all round one and then cutting the edge to the required shape.

The first method is that always followed where a circular or extra oval edge of the brim is necessary, the gores counteracting the inequality of width will leave the circumference with a clean, true sweep. The second method is only adopted where the brim outline forms some abnormality, which it would be impossible to achieve by sewing the gores to the crown, and where this is done each end of the plait used is carefully crowded towards the part where it is joined to the brim and laid down in such a manner as to preserve as far as possible the original curves of the rows of plait nearest to the crown. The third method is employed where the abnormal outline of the edge of the brim is of a too acute nature to allow even of gores being worked, and every season brings up one or more models that require this kind of treatment. The brim is sewn, taking no notice of the inequalities, to the width of the widest part (providing always that the head line gores must be inserted where practicable) ; either before or after stiffening or blocking, as the case may demand, the edge is cut with scissors to a template of the shape, and is

then bound with a row of the plait sewn all over those parts which have been cut across the rows, so that any possibility of fraying is averted. In the above cases, which are all of more or less curved lines, a row of plait is always sewn on the last row, making a double thickness. This is for two purposes, to create an extra strength, and to permit the attachment thereto of any wire or fabric desired, without stitching through the brim proper. But there have been brims of which the outside edge had a portion or portions that were quite sharply defined angles. These are now done by the third method outlined above, but in the old hand sewing days, where the operatives' fingers, instead of a machine, had to do the work, the angle was achieved by a process known as "nipping." This consisted of starting the angular portion with a piece of plait turned abruptly, even to the extent of making the foot of the turned portion lap over the foot of the foundation. This was sometimes done in working a very oblong top of a crown, but then the two ends of the accentuated oval were turned in as circular a form as possible, similar to part of the formation of a "button," but in the "nipping" case the turning point was quite sharp, needing a small tuck of the plait to be sewn underneath to get the required acuteness; the following rows were treated in the same manner until the desired width was obtained. By this means any angular projection of the brim can be obtained, but it is only possible in hand sewing. Before the advent of machinery any such process as No. 3, cutting the brim and binding, was never utilized in the manufacture of best class goods, except for those bonnets which, largely in vogue at one time, had very deep ears with round ends, and even in these cases wherever possible the method No. 2 was adopted.

But when machinery became the prime factor in the

sewing of plaits other methods were necessarily taken up, for the capability of the machine was not always equalled by the capability of the operator, and *vice versa* ; therefore, the best means common to the skill of the greatest number became the general rule. It is possible that, with the delicate adjustments which can be obtained on either of the two styles of machines in use in the trade, the last of the four methods could be sufficiently well done, but only a very small percentage of operatives would be deft enough to achieve a good result, and even in the cases of the first and second methods where gores are worked on the inside or outside edges of the brim, the final crowding and laying down is invariably done by hand sewing. The button also is another part that the hat sewer by machine still makes by hand. In the machine finished hats this part is turned in the same manner, *but in the opposite direction*, thus the hand sewn hat spirals run from right to left, whereas the machine made article runs from left to right, taking the same orbit as that of the sun. (See Fig. 14.)



FIG. 14

As already mentioned, one of the earliest machines made for plait sewing commenced the hat operations at the edge of the brim, but this was a solitary instance, all others started at the "button" and the two generic machines now in vogue, the visible and the invisible stitch, follow, with the exception of the direction, the method of hand sewing.

In order that a machinist of straw plait should be capable of producing the highest grade work, a thorough tuition of hand sewing is most helpful, and this was well demonstrated when machines were first used. The early appliances or attachments to the machines were of quite a primitive nature, in fact, they were only those in use

for domestic sewing, and the subsequent machines made especially for straw work, did not develop the niceties which now are part of the construction of the up-to-date machine, and yet, in spite of these drawbacks, the machine work done by the erstwhile hand-sewers has never been surpassed, although by aid of the possibilities of adjustment and the advent of mechanical power the present speed capacity has been at least doubled.

A process common to both hand and machine sewing is the "milling" of plait before using. This obtains



FIG. 15

SECTION OF ROLLERS, SHOWING ONE FLAT SECTION FOR HEADLESS PLAITS, AND SIX WITH GROOVED RECESSES FOR RECEIVING THE HEADS IN THE VARIOUS SIZES NECESSARY FOR DIFFERENT WIDTHS OF PLAIT

mainly, if not wholly, on plaits made of straw. In hand sewing times it was an absolute necessity, as it imparted a requisite pliability to the somewhat harsh fibres, and permitted their easier adjustment in sewing to the requirements of the shape. It also, on those plaits which had "heads," accentuated the difference between the head and the foot, giving a greater boldness of effect. The mills used for this purpose were made with beech wood frames and with boxwood rollers. Generally these rollers were designed and cut to take all widths of plait, and the "trolls," as the individual grooves were designated, were made with a double recess, the smaller one of which permitted the head of the plait

to escape the pressure exerted on the foot. (See Fig. 15.)

When the extra demand for machine made hats arose it was found that the harsher plaits of China were too wearing on the wooden rollers, and mills made of iron were produced, but on the same active principles as shown above. To-day the majority of plaits used in the trade are not milled, only the coarser and harder straw varieties being occasionally done. All Tagal and soft pedal plaits can be machined without milling, owing to the pressure mechanism which is now part of all the plait sewing machines.

CHAPTER X

STIFFENING

THE general description of the actual sewing of a straw hat, whether by hand or machine, must be followed by the statement that when sewn the hat is invariably in a limp condition, that is it is quite unfit for general wear. There are some few plaits, when made into hats, so firm in their consistency as to require little or even no assistance to keep them in shape. These shapes are mainly of the "floppy" order, and are designed either to wear as "picture" hats or to be manipulated in such a manner as to make a "toque" effect. From the earliest period of making hats for fashionable wear, and that certainly is not more than two centuries ago, some process was necessary to keep the hat, whether woven or sewn, in the required shape. The first methods were by the insertion of a kind of wicker foundation, which allowed the shape to be moulded to it; and by similar materials threaded through the rows of the plait, or being attached thereto by sewing; also by fine wires which were utilized in the same way as the wicker. Whalebone was also used as a support, and in the construction of the huge hats common during the Georgian period, cardboard and buckram were used. But all these articles, effective though they might have been, were of such great weight that means were sought to find a medium that would give the desired result without increasing the weight. One must remember that with the use of whole straws a hat of large size would be very heavy without the addition of wicker, wire, or buckram, and when, during the craze for French fashions which

followed the signing of the Treaty of Amiens, smaller hats came into vogue, such strengtheners made the hats look clumsy and distorted. The genius, whether Briton or foreigner, who discovered the use of glue or gelatine for the stiffening of straw hats, is unknown, although it is very probable he or she was French. (When the writer was apprenticed to a firm of hat makers in Paris in 1877, he was given to understand that the first gelatine process for hats was used in Paris. If the name of the inventor was given, he has entirely forgotten it, but to the best of his recollection no name was mentioned.) But other materials such as starch and isinglass had been tried, but none found entirely satisfactory until the use of glue was adopted. Gelatine is a fine variety of glue, and was developed first by the French glue makers; among the foremost of whom were Coignet Frères, of Lyons, founded in 1818. The manufacture of gelatine is now almost universal, but Messrs. Coignet still retain a very high credit for their wares. It is quite probable that either some glue used for joinery or gelatine bought for cookery purposes was first tried on straw hats by the inventor, and doubtless with such success that it was speedily taken up by all straw workers, and to-day no other medium is used for the stiffening of actual straws.

That used for the purpose is specially made, and is in varying qualities of strength and colour. For white goods gelatine of the purest colour is necessary, while for black or dark colours, a gelatine of dark biscuit tint is generally used, as its price is materially less than that of the better colour. The main requirements in a gelatine are 1st, colour; 2nd, no tendency when being used to froth; 3rd, when dry an elastic and firm result. The second condition is probably the most necessary, as although gelatine is capable of being reduced with

water to such a degree of fluidity, that it affords the best medium for penetrating the straw and giving it the required strength, if the quality is not good the mixture when used will froth like soapy water, and thus have a tendency to leave a snaily appearance on the hat.

The method of preparation for "stiffening," as the process is termed in the trade, is by soaking the gelatine in cold water for a sufficient term to enable it to become quite soft and flaccid, and afterwards with heat to melt it down in its softening bath. The weight of gelatine and quantity of water vary according to different formulæ for the "stock" mixture, and "stiffenings" of lesser strength are made by the addition of water to a certain quantity of the "stock." In almost any hat for ladies, the crown is stiffened with a weaker solution than the brim, and therefore two strengths are generally provided for this purpose. Two methods are adopted by the workers for stiffening straw hats, "sponging" and "rolling." The former consists, when the hat is on the wooden block, of sponging the hot gelatine on to the straw with a "dabbing" motion, and when the plait is thoroughly saturated, using a warm, nearly dry sponge to clear all surplus from the surface. The latter method is effected by rapidly dipping or "rolling" one or more hats into the gelatine bath, and then allowing them to drain, afterwards placing them singly on the block and sponging out the superfluity of gelatine. The first way is generally used for the highest class work, as when well done there is less tendency for the dried hat to crackle and a decided inclination towards a resilient finish. But the second plan is very successful on some materials, and being much quicker to effect is generally practised among manufacturers handling large quantities. It has one advantage, it can be done by less skilled or

careful operatives than the "sponging," which needs careful attention.

The straw boater for men during its stiffening is often soaked in the "stiffening" bath for an appreciable time in order that the gelatine may thoroughly soak into all the fibres of the plait; but that also, when it emerges, is sponged over to remove excess.

The general plan of stiffening a single piece hat (ladies' hat) with gelatine is for the operator to place the crown of the hat correctly on the wooden block. The sponge having been dipped into the proper bath, the crown is evenly and thoroughly saturated with the gelatine. It is then "dry sponged" to clear the surface, and the operator carefully arranges the rows to synchronize with the edges of the block and with each other. Withdrawing the crown block, the hat is next put on the brim block, and the sponging and arranging operations are repeated, but in the case of a wide brim the "stiffening" used is from a stronger solution bath. Before the sewer hands over the hat to the "stiffener," the hat has to be "strung," i.e. a fine thread is so attached to it as to afford a convenient means of hanging the hat up to dry, and when the stiffener has finished his operation he suspends the hat on a wooden rod, which is placed near him in a convenient position. These rods are from 3 ft. to 4 ft. long, according to individual needs, and about 1 in. square: on the longer ones from four to six hats can be hung, and when full the rod is placed in a suitable rack with covering overhead, but in a position freely open to the air.

The best results are obtained from natural air drying, whether by wind or by a mechanically arranged draught from a centrifugal fan, but in cases of time pressure, where goods are wanted quickly, recourse is made to a drying room, which warmed either by fire or by steam

heated coils is able to ensure a dry heat, by which the moisture in the hats is soon evaporated and the gelatine allowed to set. This plan is only useful in extremity, for in the early stages while the moisture in the hats is at its greatest volume, the gelatine has a tendency to run towards the lowest hanging portions of the hat, with the result of uneven strengths; and further, when the moisture is driven off, the gelatine retained is rendered more or less brittle, losing entirely the much desired toughness and resiliency. Another point against drying by heat is that it requires a stronger, and therefore more costly, solution of gelatine to be used, in order to counteract the wastage caused by running and the weakness consequent on the dried up gelatine.

The above methods are those in use for all straw, tagal or hemp, and for all chip plaits. It is also used for real horsehair crinoline, but the imitations of this article being of viscose, cellulose, or similar foundation fibres, require special mixtures of gelatine with some acid, such as acetic, to harden the fibre and prevent it shrinking or dissolving, and with some volatile fluid such as methylated spirit, to encourage the rapid evaporation of the stiffening and thus reduce to a minimum the deteriorating effects of a liquid of any kind on the artificial fibres.

Another method of stiffening these susceptible plaits is by some mixture of a resinous nature, preferably that of shellac dissolved in spirit. This method has, of course, several variations which are jealously guarded by the inventors, but the foundation of all of them is on the above lines. In these cases the "stiffening" or really "proofing" (for it is, of course, waterproof) is applied with a brush and care has to be used not to clog the interstices of the fabric. There are many



FIG. 16
STIFFENING STRAW HATS

disadvantages to the use of this medium, and its use is not general.

Cotton fibre plaits are generally stiffened with a gelatine solution similar to the viscose method, but another process was evolved for black cotton hats, by which a resinous solution after application was burned off in a blocking machine, combining at the one time the dual processes of stiffening and blocking. This, however, can only be taken advantage of when the particular variety of machine, with spelter male and female blocks, was available. (This will be described under the head of Blocking.)

These, in the main, are the "stiffening" methods in use in the straw hat trade as it is to-day, when the materials used for hats are prepared to their final appearance stage before being sewn, but in the early days of the trade when the finished plait was quite crude as compared with that of this century, some methods were utilized during stiffening to alter or improve the colour of the hat or bonnet. The earliest attempt in this direction was the production of a white colour on straw. It has been shown in previous chapters that the early bleachings simply improved the natural colour of the straw, and did not remove its yellow tinting. But it was found possible during the stiffening to carry the improvement a stage further. This was done by the mixture of some acid, such as oxalic, sorrel and other similar chemicals, in the gelatine bath. These had a dual effect, they kept the gelatine from returning gradually to its pristine brownish-yellow tint, and when the hat was stiffened the chemically treated "stiffening" was more easily affected in the bleaching by the fabrics of sulphur. (Incidentally one may remark that the addition of a similar chemical action to that produced by the above-mentioned acids, will materially improve

the colour of even the darkest tinted gelatine.) But even under all these improvements, plait could not be made as white as fashion demanded sixty or seventy years ago. Attempts were made to produce the required article by making plait similar to "twist" or "Luton" with the straws plaited inside out, that is the two splints used for each straw were laid with the outsides of the straws together, leaving the inside of the straw, or "rice," which is much paler in colour, on the outside of the plait. This, when bleached, was materially whiter than that with the silicate outside, but it did not come up to the required standard. A method was introduced called "Eramelling" or "Compoing," which consisted of a paste made of starch, or isinglass, or gelatine, mixed with various white powders, making when ready for use a thickish whitewash. This provided both stiffening and colouring to the hat.

But this in itself was an additional weight, and as all plaits with heads made the proper distribution of the enamel very difficult, some smoother and lighter medium had to be found. "7 ends Split" was the chosen plait, and for several years enamelled split bonnets were a most fashionable feature. The *modus operandi* was to spread the "enamel" or "compo" over the outside surface of the bonnet or hat, in a perfectly even manner, so that when dry it presented the appearance of being evenly whitewashed. The final touch was given by ironing the hat very carefully on the block, with a bare iron not too hot; this imparted a slight glaze, which, if unscorched, was really very fine. Various other *media* have been used at different times for stiffening straw hats, such as dextrine and other farinaceous products, and resinous and other gums, soluble in spirit or in water. Machines have been utilized for stiffening, but the little

advantages therefrom were so overweighted by the disadvantages, that they have never obtained any popular support and to-day it is probably not too much to say that every straw hat is stiffened actually by hand.

CHAPTER XI

BLOCKING BY HAND

THE process of "Blocking," as the next operation in the making of a straw hat is termed, consists of some method, either by hand or machinery, to place the somewhat uncouth looking article, exhibited by the dried stiffened hat, into its ultimate form.

Naturally, the thoroughly softened shape, saturated with hot gelatine and hung to the rod by a thread, assumes during drying an appearance totally at variance with the proper shape, and in order to achieve the correct outline some means has to be employed that will at the same time render the gelatine amenable and also fix the contours. Ever since hats have been made, whether in the oldest woven form, or in the more recent plait sewn way, this process has been a necessity. In fact the smoothing for wear of the finished hat is a process considerably older than that of giving some extra firmness. In the account of the making of the Panama mention has been made of the use of wooden mallets to obliterate the ridges caused by the "setts" and to give a general outline of conformity to the hood, and even so in the case of British made hats, even before the stiffening methods of wicker, wire or buckram, hats were given a smoothing finish by means of some similar instrument. It is probable that in the earlier times wooden tools were used here, but of these there are no records clearly indicating their nature. The earliest instrument used in the trade of which there are existing examples were termed "Slicken Stones." Of these there are two fine specimens in the Luton Free Library, and they are of different sizes, one about 4 ins. diameter

and one about 6 ins. They are circular, but flattened with a rounded bevel edge something like the shape of a muffin, but with very smooth surfaces. Their mission was to remove all inequalities from the hat after weaving or sewing, contributing at the same time a smoothness which could not be obtained from wood. They were probably used from the earliest hat making times, and certainly played a part in the smoothing of hats made on wicker. Whether they were needed for the wire foundationed shapes is uncertain, as this medium was so easily adjusted by the fingers, but they undoubtedly were extensively employed in the shaping of the buckram supports, as this article, slightly damp, could be easily moulded. They were used cold, and the probability is that in the wicker and the buckram methods, a slight steaming over boiling water, immediately followed by the application and use of these cold "Slicker" stones, would result in the possibility of shaping and at the same time "setting" the material. About the commencement of the nineteenth century they were in common use around the South Bedfordshire hat making centres, and there is no doubt they were successful in their operations on hats both woven and sewn that were sufficiently firm in their straw nature. From what can be gleaned they were still in use when the first gelatine was used, but as the necessary steaming or softening of the hat was another process, the old established method was soon superseded by the use of irons, for it was found that with a damp cloth over the hat, the iron at one time could produce its own steam and soften the stiffened material, and also make the hat conform to the shape of the block. At the time of the gelatine introduction, shapes were all of variations of the "Poke," "Coalscuttle," or "Granny" bonnet styles, and the smoothing or ironing of them was done

on a "block,"¹ something the shape of a vaulting horse, and nearly as large, for it had legs long enough to make it sufficiently high to work at without stooping. The ends were made to take the crown, or rather the portion which hung at the back of the head or nape of the neck of the wearer, into which was set the voluminous "poke" or side brims of the "petasus" or coalscuttle type that completely obliterated the side views of the wearer's face. The poke could be blocked on any part of the "horse" except the ends, and its curves and outlines varied as occasion might require. On the introduction of irons and the use of a damp cloth, known in the trade as a "strainer," the wooden horse was the only apparatus for blocking until the advent of other shapes necessitated further and more complicated outlines. When the "iron" in present use first made its appearance in the trade it has been impossible to find out. It is what is now universally known as a "box iron," consisting of a wedge shaped shell of metal with flat top and bottom, but with curved sides, into which a red hot "pad," or block of iron to fit the interior, could be put to impart to the "box" the necessary heat. That this style of iron was known long before the beginning of the nineteenth century is certain. Quaint forms for ironing the Elizabethan ruffs embodying the hot pad principle are still in existence, but the early nineteenth century accounts of the instruments used in the straw trade are something like the History of England between A.D. 500 and A.D. 800, extremely hazy! Therefore, it is impossible to fix the exact date of its introduction to the trade; one may conjecture that, like "Topsy" in *Uncle Tom's Cabin*, "it growed." Its trade birth was probably accidental, but its existence has been phenomenal in duration, for although machinery for blocking is now

¹ This doubtless gave the name to the operation of shaping.

doing a lot of work formerly done by hand, still in most factories hand ironing occupies a very prominent place, and even where hats are blocked by machine in many cases they need roughly shaping first by hand. Hand blocking is done in the following manner : the hat to be ironed is first put through some process to make the hardness of the gelatine sufficiently soft to fit the blocks. In the early days of the trade this was always done by lightly passing the hot iron over a damp cloth in which the hat was enveloped, thus producing enough steam to render the hat pliable, the crown was then carefully adjusted on the block, special attention being given to the spacing and direction of the rows of plait.

About 1880 straw hat manufacturers, having also started the making of felt hats, for which a small steam jet in an enclosed box or vessel was necessary, found that this same "steam pot" (trade term) provided an easy means of softening the hat, for placing on the wooden block, and since that time the old method of softening has practically died out, with the exception of such plaits as would be injured by steam action. When the crown of the hat is in proper position on the block, it is covered with the "strainer." This should be in a well wrung-out damp condition, and is held in its place by the left hand of the "blocker," the ironing operative. With the box iron in his right hand, he evenly and with a slightly circular motion, keeping the iron on the hat, presses out any inequalities that may be left, but with such discretion as not to injure the design of the plait. This process continues until the "strainer" is dry, which indicates that all superfluous moisture is evaporated and that the material will stay permanently in the required form. Some plaits with prominent heads or fancy embellishments require two or more "strainers" or even a thickness of flannel

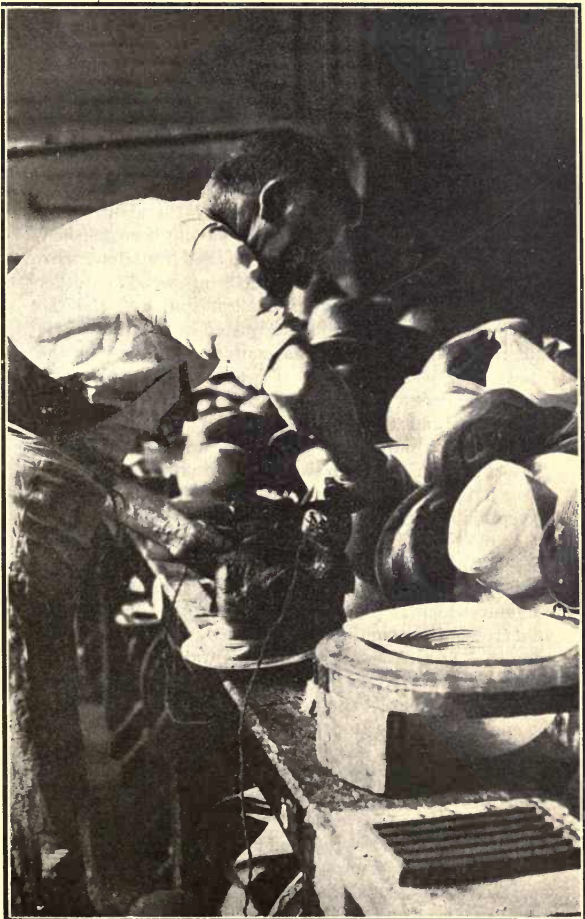


FIG. 17

HAND BLOCKING
With Iron Heated by Electricity

between the iron and the hat to prevent bruising, but plaits such as these are generally "blocked" by being "steamed" (trade term), that is the shaping on the block is entirely done by the hand of the operator after the material has been softened in the "steampot." When hats are, as they always were till about 1885, of "one piece" make, the crown having been finished, is taken off the wooden block and placed head downward in the "curler" or "brimmer" of wood. Either name sufficiently designates its form and use, and the "one piece" hat is carefully adjusted in the head entry, due regard being made to the contour of the base of the crown, and the arrangement of the first gores of the brim, so as to ensure a perfectly clean line of junction between the crown and the brim. The brim is then adjusted to the exact outline of the edge, and when true is "blocked" in a similar way to the crown. The two piece hats are done in the same way with, of course, the exception that the crown and the brim are blocked apart. It is, of course, obvious that only quite a small portion of some parts of the hats can be ironed at a time, the surface of the iron can only, at most, impinge on that amount which is parallel, and, therefore, the blocking of a crown with rounding top, bevelled edges and perhaps almost "O. G." sides, is an operation needing considerable skill, for no lines must show, nor must there be any bruise marks, and yet at the same time there must be enough pressure to cause the material to assume and retain the required shape.

The irons are made with various kinds of faces, some are perfectly flat, others with convex sweeps or curves, these are called "grecian" irons, and are intended to be used in recessed curves of crown or brim, which curves are known as "grecians," but the skilful operative can adapt the curved sides of a flat-faced

box iron to most of the concave places, so that except for extreme undulations, no recourse to the curved faced iron is necessary. There are many modifications of these general rules and methods, and it may be necessary in certain cases, such as the ironing of braids stiffened with *media* other than gelatine or water soluble materials, to employ other methods, but they are generally peculiar to the plait used and of a purely ephemeral nature. In some factories box irons are used, heated by patent fuel, others are warmed by gas and electricity, but the general convenience of the fire-heated pad causes the old fashioned iron to retain an almost universal supremacy. In work it is just as convenient as any other, and in cost it must of necessity be lower, for every factory must have fire for steam production and general warmth, and the coke burning furnaces in use in the smaller factories are usually constructed to achieve these two objects, and at the same time heat the blocker's pads. In the larger establishments steam for heating and working is generally raised in separate adequately large boilers, with a specially constructed and economical furnace for pad heating. This is made with a shallow bed, a broad iron lip, on which pads can be changed, and a guillotine-like construction in front, with a "blower" which can be made to rise or fall, as occasion may demand for the regulation of the draught.

CHAPTER XII

BLOCKING BY MACHINE

THE blocking of hats by machinery is a process much more recent in operation than hand work, and although its origin is more or less inside the possibility of a living man's memory, so confused are the *data* connected with it that little or no reliability can be placed on the greater number of the traditions. One thing alone stands out clearly as a definite indication of first use, and that is the certain seniority of the pressing of Leghorn hats. It is almost self-evident that neither machinery or blocks to stand machine pressures would be made for the manufacture of unlikely or transient materials and shapes, and while the fashion of "Granny" bonnets, etc., was constant for nearly half a century, the details of their shapes offered too many difficulties to the would-be maker of a machine to press them, to induce any great inventive effort on his part. It needed something simple in outline, and something that could be done in large and recurring quantities, to give to the inventor the necessary impetus to produce a machine to impart to the hats their final finish. And 100 years ago there was nothing in the straw market, used either for hats or bonnets, that fulfilled the above conditions except the Leghorn hat. The making of this has been described in a former chapter. The early methods, either by wood mallet or slickenstone did not adequately fill the requirements ; hand ironing was nearly as tedious and was rather dangerous, as the Tuscan straw of the Leghorns was so easily scorched, and as the demand increased the desire for a more expeditious, safe and

uniform method of pressing grew with it. The earliest information, *given with some reserve*, is that an iron pan or dish was made, moulded to the shape of the hat, and that this was fixed over a metal cauldron in which water was kept at the boil, or was warmed direct by charcoal fires. These heated the pan sufficiently for the purpose ; in fact, to-day, with all the improvements, and they are legion, steam heating in this manner to blocking machines is still general. The hat was damped and laid properly in the pan to its shape, and was pressed on the inside by a convenient tool of hard wood or stone, either of which was sufficient to squeeze the wet-softened straw into the crevices attendant on the edge of the crown and the corner made by the junction of the crown and the brim, and to impart the necessary shape to all sections of the hat. The next move towards the present models, was to have the pan as above, with a wooden, or sometimes iron, block which would, when the hat was laid in position, fit into it in such a manner as to convey an equal impingement on all parts. This was adjusted by means of an over working screw, by which some large pressures could be given. But these simple methods had great disadvantages ; it was impossible to entirely synchronize the pressure on every hat, and it was extremely lengthy and tedious. A Mr. Samuel Howard, of Luton, invented a press on similar lines, but the action was horizontal instead of vertical, this served a very good purpose for a period until MM. Desbordes,¹ of Paris, introduced their hydraulic press. This consisted of a steam heated chamber in which was placed the metal " pan " or " dish," it being the

¹ About this there is some uncertainty ; the writer, from personal recollection, believes it to be correct, but some modern Frenchmen claim the honour on behalf of M. Desireau, while others assign priority to M. Lé gat.

“female” mould of the required shape. The pressure was obtained by an overhead chamber to which an india-rubber bag was fastened. This chamber was very strong and heavy, and was, as it were, one end of a balance, working on trunnions, at the other end of which were two large metal balls as counterpoise.

To bring into operation, the chamber was pulled down so that the centre of the india-rubber bag, which was made with a teat, came into the crown opening of the pan ; the chamber was securely fastened by means of screw lugs to the portion holding the pan, and a hydraulic press was put into action which filled the rubber bag with a sufficient pressure of water to distribute the power all over the hat in the pan ; a gauge showed the pressure obtained and consequently an equal amount could be given to every hat: The results, therefore, were all alike, and as the press could be locked and unlocked in a fraction of the time required by the screw process, the work was greatly accelerated. Many improvements have been made in blocking machines since then (about 1860), but all the later models embody the important feature of the hydraulic pressure through the rubber bag. The next important step in the evolution of mechanical blocking was that introduced by Mr. Henry Keston, of Luton, adapted from a model made by a Mr. Beresford, of Stockport, Cheshire. This improvement consisted of erecting round steel uprights on the bed of the steam heated chamber, allowing the bag chamber, attached to which were slides fitting the uprights, to rise and fall vertically. The counterpoise was effected by a chain, attached to the top of the bag chamber, passing over a wheel supported by a bracket at the back of the machine and loaded with sufficient weights to adjust the balance. A hand or foot lever pressure was sufficient to raise or depress the bag chamber,

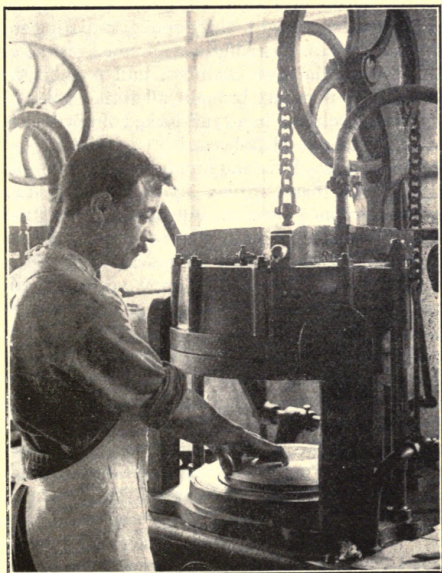


FIG. 18
MACHINE BLOCKING
By Press of Beresford-Keston Type

and water connection to it was obtained by means of a corded re-inforced india-rubber swan neck. When the chamber had descended to its proper position it was locked by means of a stout steel three-armed part like the hub of a wheel, with three spokes radiating from it at equal distances. The hub was pivoted on the centre of the top of the bag chamber, and a short lateral movement of this part brought all three spokes under very strong hook-like lugs, and locked the bag chamber securely to the pan chamber.

Water pressure above the supply pressure was effected by means of a hand worked hydraulic pump, and the force was reckoned by a pressure gauge. This method was so much simpler and easier to work, and also was so much more rapid, that it quickly superseded its predecessor; and now, after forty years' experience, is still the favourite model, although the machines of to-day contain many improvements not to be found in the original. By all these descending bag chamber models the blocking of the hat is identical. The only difference made is in the amount of pressure, some straws taking more than others without injury. The hat having been properly "roughed out" or "sweated," that is shaped to its exact size without pressure by hand or machine, and still holding a little steam moisture, is placed accurately in the pan, the outside of the hat to the metal; inside the hat is distributed as evenly as may be a thick felt dummy (to prevent the straw from cutting the bag). If the edge of the crown is very sharp, such as one finds in a man's boater, a ring of vulcanized rubber or similar material with angles corresponding to the crown edge is placed in position inside the crown before the felt dummy is introduced. The bag chamber is then brought down, securely locked, and the water pressure applied. Different materials require different

periods of time to properly set, but while one is setting the operator "roughs out" another hat, so that when the mechanical process on the one is complete, its successor is ready for the operation.

A machine, the principle of which was intended to apply to the making of buckram shapes, was also adopted by the straw trade. Its first adoption was due to the introduction of the felt hat manufacture into the districts hitherto peculiar to the straw hat making, but it was found to possess points of advantage in the blocking of certain materials. This machine has a "female" pan of metal into which a properly fitted "male" block, with the accurate amount of space for the material to be used, may enter, forming with the pan and the hat one solid piece. This "male" block is also of metal. They were first of iron and afterwards were generally of spelter or aluminium. In the particular case for which they were most extensively used, the hat was made of a cotton braid, the stiffening of which was effected by a shellac and methylated spirit mixture, as gelatine was not found entirely satisfactory. Both the "male" and the "female" blocks were heated by gas jets, and when the hat was still wet with the highly inflammable stiffening it was placed in position on the lower block, the other was adjusted to it, and when in proper place the heat of the blocks, or the light of the gas jets, fired the stiffening, which rapidly burned the spirit out, leaving the shellac or other resinous material in the fibres of the braid in sufficient quantity to render the hat hard enough for its purpose, and at the same time creating an almost waterproof fabric, that enabled the cotton to withstand the softening influences of damp weather. The operation was completed by releasing the movable block and taking out the hat.

An entire revolution in the system of blocking straw hats was introduced in 1913-14 by a M. Stoffel, of Paris. This method depends for pressure on air only, and by its means shapes almost if not impossible by any other method can be beautifully blocked. The apparatus consists mainly of a vacuum reservoir from which all air is extracted, creating a suction pressure of about 13 lb. to the square inch, exhausted by means of a vacuum pumping engine and perforated blocks placed over copper tables that are also perforated and connected with the vacuum chamber. The blocks are of wood or metal, and both crowns and brims are made to the form of the outside of the hat, and are in themselves quite independent of the copper table. The *modus operandi* is as follows: the block to be used is warmed by steam and is placed bottom uppermost on the copper table. The hat, slightly moistened by steam, is adjusted carefully on or in the block, covered with a large water and air proof cloth which can envelop the whole of the block and table, and leave a sufficient quantity to fill up the cavity caused by the interior of the crown, or the undulations of the brim. The vacuum force is then brought into action, and the suction created draws the cloth, with a pressure of about 10 to 12 lb. to the square inch, into every crevice or corner formed by the shape of the hat and block; the suction set up draws off as well any moisture evaporated by the heat of the block, and in a few moments the hat is sufficiently dry to be removed. By this method crowns of hats with concertina-like folds and creases can be perfectly "ironed," using a block made of only two sections, whereas in any other form of blocking, where similar blocks must be made in five sections, the result obtained, comparatively speaking, is more or less imperfect. Moreover the process, while being much

more rapid, does not require anything like the same amount of force expenditure on the part of the workman as do either hand or machine blocking. Another important benefit of this invention is that the actual working apparatus can be arranged in ordinary blocking benches, the copper perforated table taking up no more room than that usually occupied by a hand blocker, whereas, while other blocking machines do not occupy in themselves a greater area, the "roughing out" or "sweating" necessitates the ordinary hand blocking space which makes the actual amount nearly double. It must not be forgotten that the preliminary, as one may call it, apparatus of the "Stoffel" system requires space for the vacuum engine and pump, while the vacuum reservoir tank is, of course, of considerable magnitude, according to the services required. Both these, however, can be placed in some basement, etc., quite away from the actual blocking room. Whereas the earlier models need no extra area than the actual working spaces, with the exception of the steam generating plant, which, however, is common to all systems, and further is a necessity for other purposes such as heating the various work and drying rooms, and also for melting and keeping warm the gelatine used for stiffening, etc.

But compared with the Desbordes and Keston models, this system is not so well adapted for men's boaters work. Up to about 1910, the great bulk of rustic boaters was blocked on presses of the Keston type, and even to-day boater makers still make use of them. The hard-natured straws that are generally utilized for boaters require heavy pressure in varying degrees according to the different varieties of plaits, and in this respect the suction method is not sufficient for the high powers.

About 1910 another French engineer put a blocking machine on the market with special claims for boater work. M. J. B. Brochier, of Lyons, introduced the model now known wherever boaters are made by the name of "Carre Vive," of which the free translation, "sharp edge," sufficiently indicates the peculiar claim of the inventor. This machine in structure is a combination of some other blocking presses, but with a special contrivance for creating the extra sharp edge, and of extra lightness and simplicity in working. It has the guillotine frame of the machine mentioned for blocking cotton braids stiffened with shellac stiffening, the pan chamber heated by steam, the india-rubber bag for hydraulic pressure, and the bag-chamber moving vertically on uprights of the "Keston" or "Beresford" type. But it differs from that machine in, first, the bag chamber is really a plate with a hole in the centre to carry the bag, and is only of the most meagre dimensions of the least possible weight. Second, this is caused to descend into the pan chamber by a lever actuated by the operator's foot, the little weight of it is balanced at the end of a lever with a small counterweight, obviating the overhead chain and pulley. Third, the fixed contact with the pan chamber is made by means of a screw wheel, a small turn of which when the hat and bag are in position, firmly tightens and locks the two portions together. Fourth, the special crown edging action is done by a rising and falling movement made by the bottom of the boater pan, which is actuated by means of a lever working on a ratchet by which the pressure can be retained until the hat is ready for removal. This model is now extensively used for boaters, although at the moment of writing that extreme sharpness, desirable in boaters a few years ago, is not required in the season's models

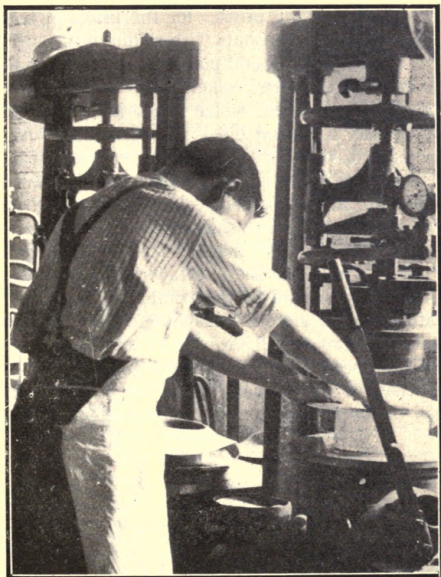


FIG. 19
MACHINE BLOCKING
By Press of "Brochier" Type

for the home trade, the crown edges of which are an almost imperceptible bevel. These practically exhaust the machines for blocking, but there are in use throughout the trade blocking presses for the brims of boaters and of some varieties of hats with rolling brims. These consist either of a flat metal plate, or open pan conforming to the curves of the rolled brim, heated either by gas or steam on, or in, which the brim of the hat is arranged, and a wooden block placed over it. Affixed to the plate or pan are two uprights with a crossbeam, in the centre of which is a long quick acting screw with a small plate at the bottom. This descends on to the wooden block and creates sufficient pressure to put the brim of the hat in correct shape. It is found very useful in "touching up" the shape of a brim that may have been bent or damaged in the trimming, as to put the hat into either of the other machines would necessitate the taking away of all trimmings and linings. The mention of these articles brings our history to its next stage—that of the actual "Finishing," as the trade calls all the operations done to the hat after blocking.

CHAPTER XIII

FINISHING. POLISHING. TRIMMING. LINING

THE straw hat having now arrived at the stage where its actual manufacture ceases, has still further to undergo the process of embellishment necessary for its proper appearance on the counters of the merchant, or in the showroom of the milliner. A great many hats of the "Leghorn" variety leave the factories without any finish of trimming or lining, but after they leave the blocking room they have to undergo a process of polishing. This is done in one or two ways. The "dry" way is for the hat to be put through a severe brushing, done by rapidly revolving brushes carrying powdered sulphur, in an air shaft which takes away the residue of the powder. This gives to the Leghorn hat a velvety smoothness and incidentally imparts a richer colour, owing to the sulphur that finds its way into the crevices of the straw fibres; although the brushing is intended to leave the hat free from the powder, in actual working that is found to be nearly impossible. The other way is the "wet," and in this case the hat is covered all over with a thin paste, of which sulphur is the principal ingredient. When dry the blocking process is gone through, and the hat subsequently receives a brushing similar to the "dry" method, but in this case the object of the brushing is to remove every available particle of the dried paste. The advantage of this method is great where the colour of the Leghorn is none too fine. The wet sulphur mixture has a bleaching effect on the straw, and naturally tends to penetrate better into the fibres and crevices than the powder alone. The result is

that the tone of the hat is immeasurably beautified and with a longer lasting colour than is obtained by simply polishing with dry powder. When properly brushed and ticketed Leghorns are then completely ready for the market.

Some few other kinds of hats go out without any trimming or lining, but the processes they undergo will be set out in one or the other of the following descriptions. Every kind of straw needs some variety of treatment before the actual "Finishing," but generally speaking these treatments are confined to the darker coloured plaits. Thus for chip plaits black receives a coating of some oil such as olive or nut, etc. This levels up the colour of the plait and intensifies the black; all other colours are simply cleared by steam, and receive no further treatment. For plaits of actual straw various things have been used during the course of time. The first method, when only black, navy blue and brown colours were available, was to smartly brush the dry finished hat with stiff hand-brushes. This imparted a fairly good shiny surface to the straw, but it had two drawbacks, one was that the brushing did not in any way improve the colour of the sometimes faultily-dyed plaits, and the other was a tendency during the brushing of roughing up the fibres of the straw. In those early days when lowness of price was not the main consideration, many hats have been glossed by brushing over with white of egg, but the expense of that rendered it useless for the bulk of the goods. The "Japan Black," that in the time of our fathers was utilized every spring on the household grates, was also tried on black straw hats, but its viscous nature was quite unsuitable for the proper polishing of straw. It was not until about 1870 that a polish made of some resinous gums and methylated spirit was put on the straw hat market.

For black this "polish" was tinted with a suitable colouring matter, and at first the finding of the proper ingredient that would remain in solution without precipitation was a long and tedious job; however, this was eventually effected, and now for some years the various best brands of straw hat spirit polish leave nothing to be desired. A German firm, Messrs. Conrad Schmidt & Co., was about the first to market in Great Britain a satisfactory spirit polish, and with recurring improvements this brand of polish, now made by the London Varnish Co., still obtains a large share of straw hat makers' demands. Brown and blue spirit polishes were produced by dyeing the gum and spirit mixture with an aniline dye. White spirit polish was of two varieties, one nearly opaque white, and the other a clear fluid with just a slight yellow tint. These can be used on all coloured straws other than black, brown and navy, but many manufacturers omit to polish the very light tones such as champagne, silver grey, sky blue, etc. White, of course, is never polished. When spirit polish was first introduced it was very costly, and on the advent of the China plait to these markets, it was found to be rather out of proportion expensive to the very cheap Canton hats. A polish made of ordinary glue mixed with lamp black or charcoal was current in Luton about 1870, and lasted in use for the lowest price goods until spirit polish became a reasonable price. The glue polish often smelt very nasty, and was always badly affected by a humid warm atmosphere. During the past few years when so many varieties of fibre have been utilized for making plaits, all kinds of polishing *media* have been experimented with, even the household bees' wax and turpentine has not been left out in the cold, but those that have made any lasting mark on the making of a straw hat are all of them in

some way combinations of gums and spirit. The rapid evaporation of any liquid put on a blocked hat is an absolute necessity, it must also not be able in any way to soften the gelatine or other stiffening material, and it must leave a desired gloss on the hat without being glassy or "fatty" looking. Further, it must not materially harden the fibres. Some plaits are required quite bright; for these ordinary straw hat polish is correct; others are wanted with an "egg shell" shine, these are provided for in one or the other of the "Lustres" and "Silk Finishes" that are to be obtained. In fact, to-day there is no material of which hats are made that cannot be properly polished. The last advantage of the spirit polish is that it gives a slight water proofing to the ladies' hat, and the mention of that brings up the question of the waterproofing of men's boaters. A boater is generally made of rustic plait of which the saw-like edges lapping over each other form a surface similar to a tiled roof, and if it were possible to sew the plait with the serrations as regular as tiling, the result would be showerproof, but such regularity is impossible, and in order to make this most useful hat still more serviceable, one or two patents have been taken out in the direction of making it absolutely waterproof. As far as one can gather in the trade, the only method of rendering straw hats rainproof now extensively used is that known as the "Cravenette." After the "shell" of the boater is sewn and stiffened, a special powder is applied carefully over the entire surface of the hat, after which a spray of the patent liquid is made to evenly and thinly cover the powder causing it to dissolve and form the waterproofing medium. After drying the hat is blocked in the usual manner, and when done, only an expert can tell from sight that the hat has been treated, as the colour is in no way

deteriorated, nor are the fibres of the straw changed in any manner.

The straw hat, whether boater for masculine wear or the ladies' fashionable hat, is, when the polish or finish is quite dry, ready for the attentions of the "Finisher" or "Trimmer." In the early days of the British trade, that is about a century ago, the work of the finisher was very limited. Practically all that was done was to insert some kind of temporary lining to the head fit, and affix a small tab or ticket for reference purposes. Gradually as more intricate shapes began to be in public favour, it was found necessary to add to the above operations, by inserting at the edge of the brim a metal wire covered with either cotton or silk. This had in view two purposes, the first that by skilful bending and shaping the desired outline of the brim could be produced, and the other was that when the proper form was achieved, the support of the wire assisted in its retention. As plaits of lace-like appearance came on the market (those of crinoline and fancy adornments, for example) the temporary linings were made from various colours of tissue paper. These not only permitted a possible purchaser to see at a glance all the beauties of the plait, but afforded means by which the bonnet could be tried on the head, with the least chance of damage, either to the shape or the wearer's hair. And mentioning bonnets, up to 1860 so much predominant in public request, and even to the present time, the wholesale manufacturer of them has always used paper for the temporary lining for all made of chip or fancy plaits, while for straws with their hard sharp heads, likely to tear the tissue paper, the probably equally short lived lining was made of fine white muslin. A common reason for these temporary linings (for they were always removed by the milliner when trimming) was that as

bonnets were kept on the show counter or dispatched to their destination, in sausage like rows where one bonnet nested in another, the lining prevented any protuberance of the plaits used from catching, and thus any part of the row could be taken from the other with the greatest facility. But by 1850 hats began to assume a considerable volume, and for these in addition to paper, which, of course, was intended to be temporary, head-linings of sateen silk, sarsenet, and other similar materials, gradually began to be used. They were made with a draw cord at the edge intended to fall into the top of the crown, where a "tip" of the same material was already in place. The lining having been sewn, as it were, upside-down to the head entry inside the crown, was turned over the stitches until the drawn cord edge met the tip ; this edge was then sewn to the circumference of the crown, the draw-cord was tightened to make the lining sit exact to the oval, and this operation was complete. But at that time and until about 1900 every hat was wired at its edge with a silk or cotton mixture covered wire. This was made especially for the millinery trade, and consisted of a fine iron wire, of which it was necessary to have the "temper" even and ductile, so that when once bent there would be no resilience, or "springing," as it was known to straw workers. Parallel to and all round the wire, which thus formed a core, were varying numbers, according to the thickness ultimately required, of strands of cotton. Around this was twisted the silk fibres, which at the same time kept all in position, and made a glossy exterior to the wire. In some qualities the silk laid so thickly as to show no break, while others according to value, showed varying spaces between the silk spirals ; others of the cheapest qualities were entirely of cotton inside and outside. The advantage of this cushion-like

pad around the wire was that stitches could be taken through it, and if affixed to the hat or bonnet with a "slip-stitch," no trace of the stitching could be seen. The ladies' hat trade also uses another variety of wire known as "miniature." This is wire of similar gauge to the "silk," but it has no padding, and consists solely of the metal and a silk or cotton yarn covering. In putting this into or on any hat, it is, of course, necessary to sew over and over as the closeness of the cover does not permit of any needle penetration. In some kinds of hats of which the brims are required hard and straight edged, steel wires of watch spring-like temper are used, and in others strengthening and shaping are assisted by strands of cane, cut into round strips, of different gauges for various kinds of work. When the wiring of hats for female wear became universal, machinery was introduced to put the wires at the edges of the brims, but this was done only to hats of the lower grades, because the stitch was very visible. Mention has been made of the tab or ticket attached to the hat by the "finisher." This is primarily, in fact absolutely, for purposes of reference; the shape number, according to the manufacturer's registry, is written on it before dispatch, together with any other special markings required by the purchaser, but almost every wholesale distributing house in Paris, London, New York, etc., etc., has some distinctive ticket. This generally bears a trade mark, crest, or other sign peculiar to the house in question, and may be of any colour; even black, with gold or silver printing, has been used, and as they vary in marks and colours, so they vary in size, from, say, $\frac{3}{4}$ in. wide and 2 in. long, to even 2 in. wide to 4 in. long. Their shapes are very numerous, rhomboids ellipses, circles, pentagons, conic sections, parallelograms, half-moons, stars, and all other geometric-like

forms may be found in ticket shapes, but the major part of those used partake of a "sweep" that has some conformity with the outline of the hat or bonnet.

Generally speaking, trimming a lady's hat is the special province of the milliner, and in this case, of course, hats are not confined to those made of straw or plait, and, in fact, this is an industry of its own, and is, therefore outside the scope of the making of a straw hat. But for many years both ladies and gentlemen have worn what have been at different epochs called "sailors" or "boaters." The making of these hats for men has nearly always been accompanied by the trimming; and when, about 1880, women commenced to wear "sailors," many of them were dispatched from the St. Albans factories with some trimming. About 1890 the makers of ladies' shaped hats of simple form began to add some little adornment to them, and these were designated as "semi-trimmed." It is, therefore, quite inside the history of the straw hat to include some account of men's boaters, ladies' sailors, and "semi-trimmed" or ready-to-wear hats. The first straw hats to be trimmed by the manufacturer were men's boaters. Their trimming has not very materially altered from the first output up to the present time. There was a ribbon band and bow at left hand side on the outside of the crown, and there was also some head lining. Anyone conversant with the boater of to-day will recognize that these salient features are still maintained, the only differences from time to time being in their nature and detail.

For the head linings, leather, flannel, cotton, imitation leather, satin, and various other articles suitable for comfort to the head and moisture absorption have been and are still used. The most material change has been effected in the imitation leathers, which have now been

brought up to such a high standard of excellence from what one might almost term "the lowest depths," that they are very formidable competitors of the real article. At the same time they do not quite compare with good class leathers, which are still always used for the best hats. Where boaters are lined with flannel, cotton or satin, they are generally made in the form of a thin pad, and for certain markets are much esteemed. The other part of the interior of a boater is sometimes left without any other adornment, but generally the sides are decorated with a lining of white open work net, and the top is covered by a tip of silk, satin, sateen, or cotton, which generally has the centre printed with the retailer's name and address. For other markets the side crowns inside are covered with materials similar to the tips, in all kinds of colours, and arranged in both plain and fanciful manners. The exact fitting of these head linings, or "sweatbands," as some term them, is an operation needing skill, and the work has been rendered more easy by the invention of Mr. Bracher, of Stockport. This, now known throughout the world as "Brachering" (pronounced Brashering) consists of a small strip of material around a fine strand of cane or other material, which is sewn by a special stitch machine to the lining or leather, making at the same time a neat, untearable edge and a convenient means for attachment to the hat.

From time to time various inventions have been made for the ventilation of boaters, these generally consisting of some open work straw being used at the base of the crown instead of the nearly impermeable rustic. This, when covered with a thin band of ribbon, is not visible from the outside, and affords some fair degree of air passage. Other methods have been adopted by having a punctured edge to the sweat band, which

permitted air to freely circulate close to and all around the head of the wearer. To increase the resiliency of the leather or imitation leather lining, patents have been taken out for pneumatic surrounds, forming an air cushion all round the hat, which incidentally allows in the easiest manner for any discrepancies, and they are very common, in the contour of the wearer's skull. The various devices for increased comfort and utility in boater linings are very numerous, and display great ingenuity. The "Autoform" The "Bon-Ton-Ivy" and the "Eesola" pads, each of them specialities of various makers of boater sweatbands, present differing features creating resiliency around the head of the wearer. These are produced by means of soft material insertions under the leather or other lining, or of cellular impressions made in the leather, or of a continuous roll all around the head fitting part, or even of the insertion of a pneumatic tube, all creating a cushion like addition to the flatness of the lining material. Each has its peculiar merits, and for certain purposes are perfect in their utility. Some are very little more costly than the plain leather, but others from the extra material and work involved are naturally more expensive, but the efforts of their manufacturers to raise the standards of quality and of efficient comfort are such as to deserve special commendation.

The most recent development for ensuring the comfortable wear of the hardest boater is that of an American inventor. Although the making of straw hats from plait has been an established industry in the United States for at least half a century, and the amazing increase of the trade has been phenomenal, yet up to the present the name of an American has not been written very prominently on the pages of straw trade industry. It is true that the first machine to sew plait

was the product of an American firm, but, it was not really successful until it had been altered and adapted by a Luton engineer ; it is also true that Mr. Bodsworth, an American, introduced a straw sewing machine, but as previously stated, this was not a striking success, and although at the present time the principal machine in the trade is made by an American firm, it is the result of a Briton's invention. And, therefore, it is with pleasure that in this record of the trade a real invention, which promises to be of the highest value to the boater trade, can be laid to the credit of a citizen of the United States. Mr. Herbert L. Moses, of Baltimore, has patented a device for attachment just inside the head entry of a boater which consists of a floating, flexible band, held in position about $\frac{1}{8}$ of an inch from the hat by a series of stitches at about half an inch intervals all round the crown. The principle is that the stitches of cotton take the place of the spokes of a wheel running inside another wheel, where a thrust in one part is compensated for by a relaxation of the other parts. Over this is sewn the leather sweat-band, or head lining of any other nature, attached to the hat in the usual manner. The necessary machinery for the insertion of this flexible *conformateur*, for that is actually what it amounts to, is provided by means of mechanical attachments to any suitable sewing machine. These attachments form the subject of another patent by the same inventor, who has assigned his rights to Messrs. M. S. Levy & Sons, of Baltimore, U.S.A. The peculiar features of this patent are, first, the ease of fit conveyed to the wearer of the hat, and, second, the great yield given by the device obviates to the utmost extent the need for small intermediate sizes of the hats, for fitting the many-shaped heads of customers.

Co-eval with the boater, and perhaps even a little

earlier, was the "Galatea" or "Jack Tar" for boys. This hat was founded on the shape of the "Sinnett" rustic hat worn by sailors in the Navy for so many years. The model was in use at the end of the eighteenth century (as pictures of Lord Nelson's sea fights clearly demonstrate) made both in straw and in tarpaulin. It was quickly adopted for boy's wear, and for many years formed their summer hat. No boy could go to the seaside without one.

A painting, executed about 1850, illustrative of Queen Victoria, Prince Albert, with the then Prince of Wales, afterward King Edward VII, shows the Prince wearing a straw Galatea, and any observer of the pictures of that time in the various periodicals such as *The Illustrated London News* and *Punch*, cannot fail to notice how popular this "Jack Tar" style was among the youthful males.

The other department of trimming in the straw trade, that of the "semi-trimmed" hats for ladies, is of comparatively recent origin compared with the boater, for at most it can claim an existence of only thirty to thirty-five years, but the trade has now grown to such large dimensions that any account of the straw hat would be incomplete without it. It commenced, as most things do, in the trade that was done for some years in sailors for ladies. Those in the main were on the same lines as those for men, that is they started with square edge crowns, upright sides at right angle to a perfectly flat brim. Developments of a fanciful nature in the brim formation in the direction of what is known as a "Breton" sailor, of which the characteristic is a slightly turned up edge, were the first to be made, and subsequently crowns of softer outline with overhanging tops attained for some time a great share of fashionable favour. But to-day, with the exception

of straw sailors for girls and young ladies at school, there is very little demand for hats of this description. But the trimming, which was nearly a necessity of these hats, had established, in many factories, departments which on the decline of their sale, required fresh openings, and attempts were made on "Alpine" models, then in great vogue for ladies, which proved very successful. This whetted the appetite of manufacturers, and all kinds of "ready to wear" hats for sports were speedily on the market, one thing led to another, and now all manner of shapes, toques, medium size, and picture hats are being trimmed in a manner that from its departure from the early extreme simplicity, seems to trench considerably upon what has always been considered the proper domain of the milliner.

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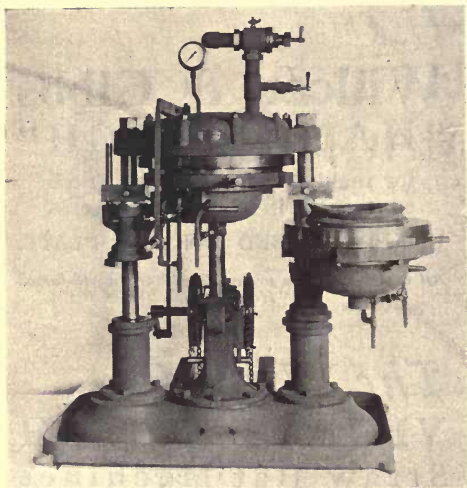
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