THE TEXTILE MERCURY.

Machinery.

IMPROVED HEILMANN COMBER.

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The cotton combing machine, as is well known, is essential to the production of the highest class of work, and the best quality of yarn. The reason for this is that it possesses in a much more perfect degree than the carding machine, namely, extracting impurities, short and immature fibres, and laying the perfect ones in parallel order. But in addition to this it does what the carding engine cannot do; it extracts all fibres that fall below the length of a given standard, and thus produces a uniformly otherwise unattainable. In the subsequent process of spinning this is important if it be desired to obtain fine counts, as the cotton will make, for if it should contain short fibres, the yarn must necessarily, be considerably weaker than if they were all of or exceeded the maximum standard required to produce the best results. This can be ensured by the use of the combing machine. Its proper field of usefulness is in the spinning of the finest, medium fine and the highest qualities of the low counts of yarn, and the districts in which it is best known are Manchester and Bolton, and some of the smaller towns around these in this country. It is also extensively used in the United States.

On the Continent it is in several places used for combing even Sarat cotton.

The cotton combing machine is the invention of Joseph Heilmann, of Mulhaken, one of the best known manufacturers of the cotton trade upon the Continent. Heilmann was a man of considerable mechanical ingenuity. He first patented his invention in 1845, but it took several years to mature. It remained unknown until the Exhibition of 1851, when it was introduced to the English cotton trade, by which its merits were discovered. Its high value to the "finishing trade" was recognized, and a syndicate was founded for the purpose of obtaining the English patent for the cotton trade. This was accomplished for the sum of £30,000. The new proprietors placed its construction in the hands of the eminent firm of W. H. Hethington and Sons, Manchester. Its use was confined to the members of the syndicate until their immediate wants had been supplied. Subsequently arrangements were made for supplying outsiders under the imposition of a royalty of £30 per machine, which, with cost of construction, brought up the outlay required for a machine to the sum of £300. This, however, did not prevent its extensive adoption by the trade, as it rendered feasible the use of cottons that would otherwise be quite unsuitable for fine yarns. It increased their production and extended their consumption, and gave thereby a great impetus to the development of the fine spinning branch of the cotton trade.

Messrs. John Hethington and Sons retained the exclusive right to make these admirable machines as long as the patent endured, and practically maintained the monopoly for a much longer period, by the use of subsequently patented improvements. During this time the proprietary rights of the syndicate lasted, they paid to it in royalties nearly £200,000, and since they commenced to make the machine, they have supplied the trade with over 400 machines, thus increasing the production nearly 20 per cent., and improving the quality of the work by preventing bad selvages. New improvements only require the same width of guide plate and feed rollers as before. Its importance, however, is so considerable that it is desirable to describe and illustrate it in detail.

The following illustrations show the improvement in its various aspects both in position and detached. In fig. 2 is given a front view of part of the nippers showing them closed; fig. 3 exhibits a corresp. section. It will be observed that only one end is shown, that being all that is necessary for the present purpose. Figs. 4 and 5 are front view and cross section of the same time the nippers shown close; fig. 6 an end view, and 7 an inside view. In figs. 2 to 5 the guide plate is shown attached to the end of the cushion plate, a, the front being shown in fig. 2 and an end or outside view in fig. 5. In each fig. 6 indicates the nipper plate. The guide piece consists of two projections, c and d, which spring from a common or connecting piece e, as shown in figs. 6 and 7. The cushion plate a is of course fitted with a guide at each edge. The projecting lip of the nippers b is cut away at the part time that the nippers shown closed, to clear the front guide, which extends backwards and comes in contact with the cushion plate a, as will be seen in figs. 4 and 5, the latter fig. giving a view of the guide plate as seen when looking down upon one end of the cushion plate. This construction of the front guide prevents the fibres from escaping sideways between the guide and the cushion.
plate. The gripping edge of the nipper plate, as seen in fig. 3, is made to extend horizontally past the front guide to the point in order that any fibre that is extruded behind the nipper plate will be held and subjected to the action of the comb. From the front guide there is a slight horizontal projection e, extending just beyond the lower adjusting guide, where the nipper plate a comes down the end of the lip passes between this projection and the cushion plate. The purpose of this projection is to prevent the extrusion of the fibres from the nipper plate c, and to ensure that all shall be properly combed.

The back guide d is curved to clear the nipper plate as it descends, and the inner vertical edge in line with the edge of the front guide, and by this means the lateral spreading of the fibres is controlled both at the back and front of the nipper plate. From this description and the detailed illustrations our readers will readily comprehend the nature of the improvements effected.

Other alterations in detail have been made all tending to secure the effect aimed at in the alteration of the former time consumed in finishing, and this is fitted with a brass guide which conveys the sliver after spreading it out. This is so constructed as to give the open sliver an inclination on the edges to fold over before passing through the bobbin tube, but in which the parallel arrangement of the fibres is better maintained than if subjected to the risk of being doubled back upon themselves, a liability encountered to a slight extent at that point. The speed of the comb has been largely increased. Formerly it made about 60 nips per minute, which was gradually increased until now, by a wide margin, greatly improved, and in Messrs. Hetherington's machine, a speed of from 80 to 100 nips is easily attained. The grooves in these are all cut by milling tools whose diameter is the same as the bowls which will work in them. This obviates in a most perfect manner all irregularities. These constitute a great advance, and largely increases the economical value of the improved machine. Whilst inspecting the machine, we noted with pleasure, the good workmanship put into it as shown in the high finish of the various details.

The makers have recently applied an electric stop motion, on a well-known principle, which will be found of considerable advantage.

We may conclude this notice by stating that the invention can be, and indeed has already been, extensively applied to existing machines, at a very small cost. Regarding this, and any other details, the makers will be pleased to afford any other information that may be desired.

WASTE IN COTTON MILLS.—The Boston Journal of Commerce publishes the following concerning the amount of waste made in the process of manufacturing cotton into cloth, as the result of careful tests made at half a dozen of the most economically managed manufacturing establishments in New England, spinning, doubling, and finishing, with remarkable results. The tests were made in three different mills, belonging to the same company, the variations in the tests being not over three per cent. in the total result, but of considerable variation in some of the departments. The tests lasted for six days, resulting as follows:—

<table>
<thead>
<tr>
<th>Department</th>
<th>Per cent. of waste</th>
<th>Total waste in per cent.</th>
<th>Per cent. of waste</th>
<th>Total waste in per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinning</td>
<td>2.5</td>
<td>5.0</td>
<td>3.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Doubling</td>
<td>2.0</td>
<td>4.0</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Finishing</td>
<td>1.5</td>
<td>3.0</td>
<td>2.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

The total amount of waste in manufacturing cotton into cloth is therefore 14.5 per cent., or a total of 43 per cent. of the waste, which is considered to be a very small amount.

Waste of Design.—The waste in design, as represented by the fabric waste, is also very small, only 0.5 per cent. of the total cost of the cloth. This is due to the fact that the design is carefully planned and executed, and the material is carefully selected.

In conclusion, it may be said that the amount of waste in manufacturing cotton into cloth is very small, and the processes are highly economical. The results are due to the careful attention given to the details of manufacture, and the use of the latest machinery.