

Machinery and Appliances.

IMPROVED CARD.

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It may almost be safely asserted that cards and carding and the means of best accomplishing it, during the past 15 years have received more attention than all the rest of cotton manufacturing processes put together. This has arisen from a perception and appreciation of the fact that it is the most important of the series, and that if the best work is to be the outcome of a spinner's labour the strictest supervision and care must be exercised in this department. As a result, the

tora. Very perfect as is now the whole series of machines required in the cotton spinning processes, it may be stated with confidence that the card takes the lead of all.

With a consciousness of these facts it might be wondered what, if anything more, could be done towards rendering it absolutely perfect. Ordinary people would certainly be tempted to say, "Nothing! it is a finished machine and cannot be further improved." Yet this is not the conclusion of those whose acquaintance with it is of the closest kind, namely, practical men. Hence hardly a week elapses without some improvement in detail being accomplished and patented, sometimes relating only to matters of small moment, in others to such as must be regarded of importance. It is not only to one but to several of the latter that we now propose to draw the attention of our readers.

The firm of Messrs. John Hetherington and

the front in the estimation of cotton spinners and the incorporation of the improvements indicated by the inventions just mentioned, shows both a determination and the accomplishment of it, to hold the position they have acquired. The nature of the improvements referred to above, and for which the said patents were obtained may be briefly indicated. That of 1884 was for an improved apparatus used in the covering of carding engine flats; the one of 1885 was for a better method of covering or enclosing the cylinder and doffer, and facilitating the adjustment of the various parts which in the main were rendered simultaneous: that is, the parts were so connected that correct relative positions were maintained in all cases through any changes that were made. The improvement secured by the patent of 1886 was an important one, being the transposition of the flexible bend from its position on the outside of the fixed bend

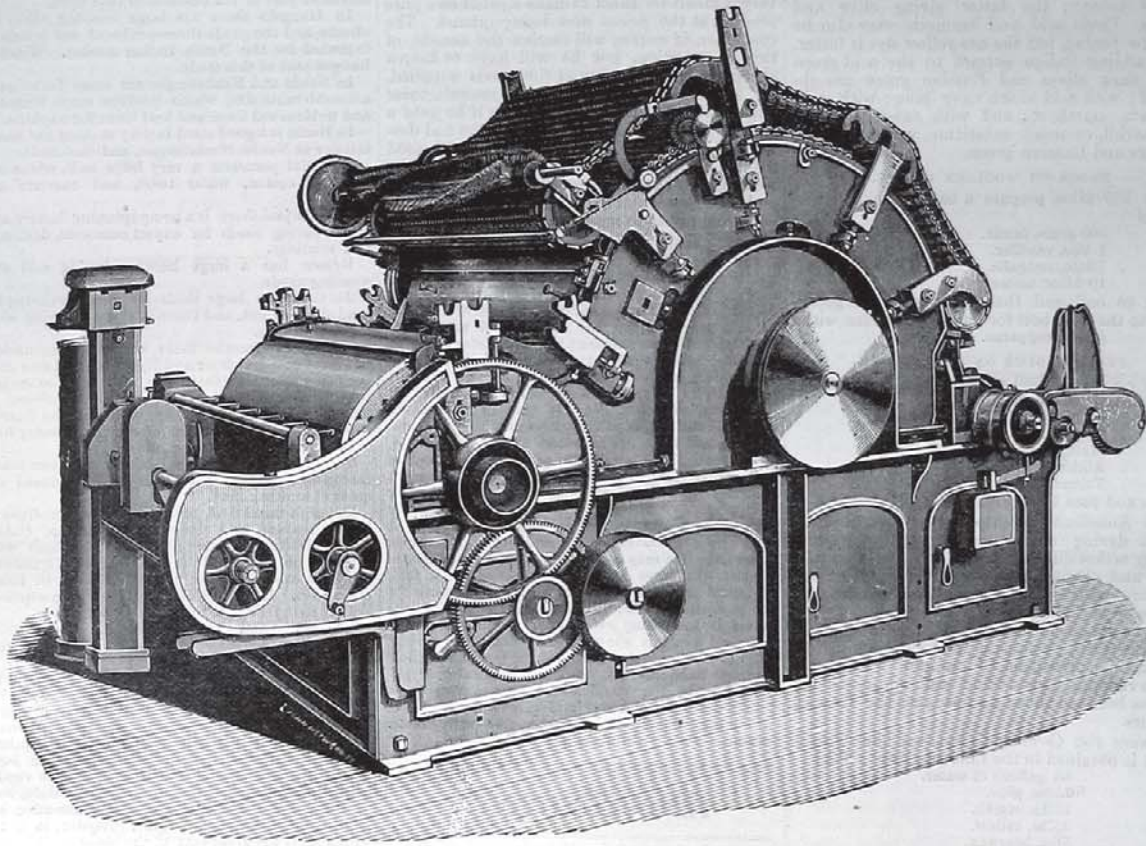


FIG. 1. IMPROVED REVOLVING FLAT CARDING ENGINE.—MESSRS. HETHERINGTON AND SONS, MANCHESTER.

card itself has been carefully gone over in its minutest details and every point brought into accord with the strictest scientific principles. This has led to a revolution in card building, for though the machine in its general appearance is still much the same, it is a much more perfect embodiment of mechanical science and skill than ever before. Not only has it been constructed according to the best principles of science, but it now gets bestowed upon it the most careful and conscientious labour, resulting in a perfection of finish in detail to which it was along with every other machine until the time referred to above almost a stranger. This improvement has taken place in all the leading machine making establishments as a matter of necessity, as no one not wanting to fall out of the race could afford to lag behind its competi-

Sons has long been known as one of the most important engaged in the construction of cotton machinery. Cotton combers were for a very long time a great and highly successful speciality with them, and it could hardly be otherwise than that they should be equally eminent in the production of carding machines, seeing that both these machines are used for what is substantially one process, differing not in principle but detail. The records of the Patent Office show that Messrs. Hetherington were amongst the first to devote great attention to the improvement of the card, as many patents have been granted them for that purpose, whilst others were issued to them so recently as in 1884, 1885, 1887, 1888, and 1889, for inventions having the same object in view. Previously to the first of these dates the card Messrs. Hetherington made stood well to

to the inside, by which the whole face of the cylinder was rendered capable of being covered with clothing up to its edge, thus getting a wider lap with perfect selvages from the same machine; or alternately a reduction of the space occupied by the latter, whilst obtaining the same width of lap. This alteration is clearly illustrated in Figs. 2 and 3, the former showing the ordinary arrangement, and the latter the improvement. Another important advantage which also accrued from the invention of this plan was that the bearings of the flats were very much shortened, and the distances between the points of suspension diminished, which lessened the liability of their bending or curving inwards towards the face of the cylinder whilst at work. The contact of the ends of the flats with the flexible bends also enclosed the card cylinder

more effectually than was done in the plan superseded, and this contributed greatly to making a more perfect selvage. The next patent, that of 1888, was granted for an improved method of grinding the flats from their working surfaces, and which has since become well known. This was, if we are not mistaken, one of the earliest attempts, if not the first successful one, to accomplish this desirable end. On its importance it is quite unnecessary to dilate. The next and last of the patents to which we need to draw attention in this connection is the one of the current year which had for its object the securing a more even delivery of the cotton forming the lap to the taker-in. In the older form the feed roller was controlled in its movements, due to the varying thickness of the laps, by means of fixed guides which compelled it to move in a straight line to or from the shell which forms part of the feed apparatus. In consequence of its movements being controlled in this manner it was liable to lose its hold upon the material either at the back or the front, and to induce considerable irregularity of feeding, with all the bad consequences that results from

for obtaining a more perfectly regular sliver with corresponding advantages through every subsequent process.

In the card illustrated herewith the patented inventions just described have been incorporated, along with many other improvements in detail which render it a machine difficult to surpass in the combination of advantages it offers to cotton spinners. To these details we may be permitted now to refer at such length as we conceive their merits justify, whilst the former will need only such passing reference as may be required to bring into notice points not hitherto advanced.

The change of the position of the flexible bend, in allowing the flats to be shortened, diminishes their weight, increases their rigidity, and lessens the friction incident to their traverse. The flexible bend is set from three points. The centre bearing also forms a fulcrum from which the other points are set. The two end set-screws also set the flat bowls; bend and bowls being set at one operation. In the flexible bend a curved groove is constructed in which is fixed a stud carried

up to the cylinder edge. This circular plate is set concentrically to the cylinder, the under casing being brought up to it by adjusting screws. The under casing is fastened to the circular plate and is capable of easy adjustment to suit the requirement of the wear of the wire. This arrangement prevents blowing, keeps the under casing rigid, whilst its adjustment is rendered easier.

The front cover or casing of the doffer is very simply arranged; on each side of the card is fixed a cast iron arm, to which is attached the cover composed of steel, the bottom edge of which descends to the lowest position of the doffing cylinder in order to prevent accumulation. One end of the cast iron arm being hinged to a bracket on the framing, allows the cover to be turned back out of the way while the stripping and grinding is performed. It also forms a shield which assists in keeping the dust down during stripping. This cover is also adjustable to the cylinder to allow for wear of wire.

The top of the doffer pedestal forms a bracket to which is attached the grinding step. As the doffer is set to the cylinder the grinding

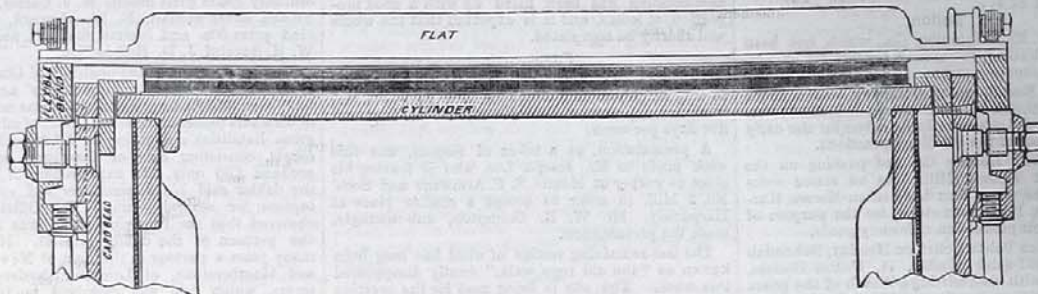


FIG. 2. ORDINARY ARRANGEMENT.

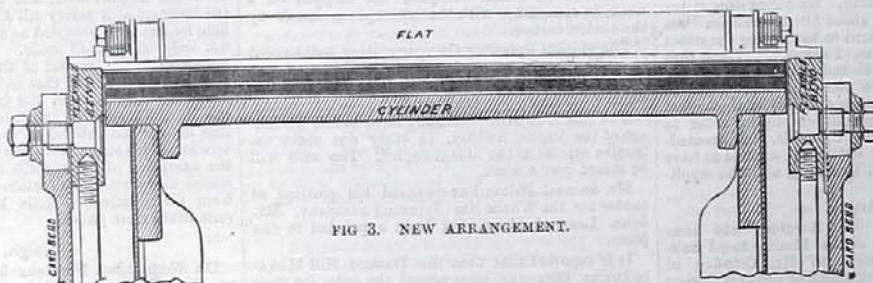


FIG. 3. NEW ARRANGEMENT.

such a condition, and which could not afterwards be eliminated. The defect has been remedied and the construction simplified by mounting the feed roller in bearings formed in the upper end of the weighting links, or in parts secured thereto, which leave the roller free to accommodate itself by lateral movement to any variation in the thickness of the lap; otherwise to make a bed for itself upon the surface of the laps despite any irregularities. This secures a much better general hold of the material than before, and prevents the latter being dragged through in masses by the taker-in, or of being retarded on the opposite side by the failure of the roller to secure a proper hold, and to draw it forward. The weighting links and levers have an improved arrangement by which the pressure upon the feed roller is so arranged that the acting force will always tend to keep the roller in its proper place: that is, near the front edge of the shell, the best position for securing an even delivery of the material to the taker-in, and consequently

from the bowl bracket, by which the flexible bend is set and prevented moving outward, or away from the cylinder, whilst it leaves it at liberty to move in a direction concentric to the cylinder, as may be required in resetting in consequence of the wearing down of the wire of flats and cylinder.

The improved feed motion partly described above, is composed of a projection cast upon the dish or shell, and which projects through the flange of the card side. To this is attached the bracket which carries the weight lever for the feed roller, and also a lever which carries the gearing from the feed roller to the lap roller. This arrangement allows of all these parts being set at one operation; thus when the dish feeder is adjusted, the above-named parts are also carried into their correct relative positions.

The under casing is adjusted to the cylinder by means of a cast iron circular plate which is fastened to the card framing, and also fits close

step is adjusted with it thus keeping the roller relatively in one position to the doffer.

By the transfer of the flexible bend to the inside position a space was left between the edge of the cylinder and the flexible, but this has been neatly closed up from back to front of the card, and any chance of blowing quite prevented.

The reader will perceive from this description that every detail necessary to the construction of a very high class machine has been carefully perfected as far as possible in accordance with the best principles of mechanical science; whilst it might go without saying that the material and workmanship is of the best.

In our next we hope to describe and illustrate the several adjuncts which have not been touched at all, or only incidentally mentioned, and of which our available space at the moment precludes our taking proper notice. In the meantime any further information will be given by the makers to interested persons who may desire it.