Machinery and Appliances.

WASTE SPINNING MACHINERY.

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Times are changed in the textile industries since the early days of the century now entering upon its closing decade. The revolutions in the systems of industry from the manual to the mechanical were then only beginning, but were showing themselves possessed of so much force that it was impossible to arrest their progress. It was soon found by those who got properly into them, especially in the cotton trade, that there was a very considerably increased margin between cost of production on the mechanical system and the prevailing selling prices, which were based upon production by the manual system. The world of consumers was not however aware of this, and continued for years to pay the old prices. Hence the great fortunes made by the old manufacturers and spinners—the Peels, the Strafts, and many others, only less known than these. Labour, too, was cheap, as the displacement of the hand-loom weavers, owing to the increased production that one worker could obtain from the power-loom left a large number of hand-loom weavers unabsorbed, and provided employers with an abundant supply of unemployed workers who were ready to accept employment at low rates, until by the expanding trade their numbers were reduced and something like a balance between supply and demand was re-established.

Since then, as our readers will mostly know, there has been a slow but steady increment in the volume of the workpeople’s earnings. It would also be safe to say that there has been quite as steady a decline, and that to a much greater extent, in the employer’s profits during the same period. Thus the spinners and manufacturers of the time referred to had opportunities of making money which their successors have not enjoyed. We draw attention to this condition simply to shew how the present state has sprung directly from it. The profits made in the cotton trade, being re-invested therein, increased the competition and diminished the aggregate profits; at the same time the earnings of the workers were steadily rising. The profits made of the spinner and manufacturer waned to the smallest dimensions, and in order to maintain it in existence at all it became necessary to effect great economies. Too, indeed, the trade may be said to subsist upon these, for any mill would now be glad to have as much to share in “divid” as has been saved in economical methods of working and utilisation of waste between what existed then and the conditions of to-day.

One great source of replenishing the profit fund has been found in the utilisation of the by-products of spinning and manufacturing, usually denominated “waste.” During the first card-room sweepings, roller, and flat waste. We also include herein analogous waste from other textile industries. Damaged cottons, from whatever cause resulting, can be worked up in them. Very short-stapled cottons can also be worked with advantage. It is strange that as yet only a small interest has been manifested in the economic use of waste by English spinners and manufacturers, who have been content to dispose of their waste products to dealers in the articles, and these have mostly sold it for shipment abroad to Germany, Holland, Belgium, and other parts of the Continent, where under the name of Vignone and Barchent spinning a considerable industry has been founded, of which waste forms the raw material.

The low prices necessarily obtained for goods such as those made from the materials enumerated preclude the spending upon them of more than the smallest amount of labour necessary to give them structure fitting them for use. They are therefore put through a few processes. The first passage is usually through a strong Oldham willow to shake out the foreign impurities and the heavy dirt. The next is through a scister, in which the material is loosened and disentangled to fit it for the third passage, that of the breaker card. The scister is often dispensed with, and the material, after being cleaned and mixed in the willow, is spread on a lattice behind the breaker carding engine which is illustrated in Fig. 1. This card, which consists of the roller and cleaner type, the most suitable for the treatment of materials on the woolen principle, is a fine well-constructed machine, in a strong case of metal. The cylinder is go inches in diameter and go inches across the wire. It has six rollers 6 inches diameter, and dirt-roller of the same size. Its six clearers are 3½ inches in diameter, whilst the diameter of the “fancy” roller is 10 inches. These dimensions are those of the rollers when without their clothing. The feed lattice is arranged for feeding by hand or by two laps. The feed roller is
covered by saw-tooth wire or fillet, and the take-in with metallic wires. The wood drum upon which the lap is formed is 49 inches diameter. In the illustration, however, it is fitted with a 39 inch drum for the manufacture of wadding. This machine is made 40, 48, or 50 inches wide according to the requirements of the condenser. The material as it comes from the doffer is wound upon the drum. When it has attained the proper thickness it is cut across and rolled upon a wood rod or roller to form a lap for the finisher card, to which it next passes. Instead of this lap drum, a "Scotch feed" may be used between the breaker and finisher card, or any other system of feed used in the woollen trade, but the lap drum described is found to give the most even lap, because in the formation of this lap the thin web combed from the doffer is wound round the drum a very large number of times, and inequalities in the web are thus imperceptible in the finished lap. The breaker card is also sometimes fitted with an ordinary "coiler," and a "Derby Doabler" is used to make the slivers produced into a lap for the finisher card.

The finisher card is in all respects similar to the preceding, except that it is furnished with rather finer clothing, and instead of the drum for the reception of the material as it is doffered, an improved Bollette condenser is substituted. The card with this attachment is shown in Fig. 2. The web of the material, now greatly changed from when it entered the first machine, as it is combed from the doffer of the finisher card passes through the condenser, and is divided into a number of ends or rovings, these being rolled by a lateral reciprocal action of the leathers, which being very different from anything in the cotton trade, is very surprising to a person only familiar with its ordinary processes. The condenser is driven direct from the card cylinder shaft. The rubbers are driven by hand, with improved tension appliance, whilst an improved eccentric is supplied for rubbing. The rovings thus taken off vary in number according to the width of the card, the counts to be spun, and the quality of the material used. On some cards, such as the one represented in our illustration, as many as 120 ends of rovings are taken off on four condenser bobbins upon which they are wound, and are then ready for the mule.

The mule used in this series of machines is a patent self-actor, constructed and arranged in all its details for spinning on the woollen principle. It has been found impossible to spin good and level yarns from low waste or sweepings with three lines of bottom rollers. The fibres being of unequal lengths, it is impossible to set the bottom rollers to all lengths of staple at the same time; therefore the three lines of rollers are substituted by one line. Consequently the rollers are only used for measuring the amount of sliver to be drawn into yarn at each outward movement of the carriage. During the time the rollers are measuring out the sliver, the spindles are running at their first speed, which only puts sufficient twist in to hold the yarn together. As soon as the rollers stop the drawing commences and the spindles change to the second speed. At this stage the twist can be seen running backwards and forwards, and always running into the thinnest places, thus leaving the thick places without twist, so that the carriage is always pulling at the thick places. Thus the drawing and evening go on together. On the completion of the outward run the third or quick speed comes into gear, and the yarn receives its final amount of twist.

This method of drawing permits of the use of all kinds of fibrous materials and any mixtures of these; also any length of fibres from long ones to the smallest that can be carded. The rubbing of the rove in the condenser, in conjunction with this method of spinning, conduces greatly to the production of a very even, round, and woolly-looking yarn, even when little or no wool enters into its composition. The counts for the spinning of which the system is best adapted are 2's and downwards.

We have always maintained that the improved cotton mule is one of the most, if not the most, perfect mechanical wonder of an automatic and useful character that can be found. A careful and lengthened examination of this new patent self-acting mule for spinning wool, shoddy, mungo, cotton, and other wastes leads us to believe that it considerably surpasses the cotton mule in the number and variety of its automatic movements. We illustrate it in Fig. 3. Its frame is strong, its parts and motions are as simple as possible, and it has the great advantage of being comparatively noiseless when in operation. The headstock is strongly constructed to ensure steadiness in running. It stands on strong foundation plates, to which are fixed by bolts two strong main slips supporting a strong and self-contained square with planed beds, thus securing
accurate setting and great stability. According to the position of the main shafting in the mill the head is made either with rim at side, the rim shaft being placed parallel to the carriage, or with rim at back, the rim shaft being at right angles to the carriage. Incorporated in it are more patented motions and improvements than were perhaps at one time ever before presented in one machine. They may be enumerated as follows.—1st. A patent strapping or governing motion for making the cop bottoms, which is entirely self acting, requiring no help whatever from the mind. The quadrant nut ascends in exactly the same ratio as the cop bottom increases in circumference, thus producing an evenly wound bottom, free from snarls. This motion is purely automatic, resetting itself after dofing, the action of winding the coping motion back, resetting the governor again in position for the first draw. 2nd. When the yarn has received its final amount of twist it is considerably shorter, and to prevent the breaking of the threads a jamming-up or draw-back motion is applied.

disengages the taking-in motion, and so forth, thus avoiding all breakages. 3rd. A patent arrangement for keeping the breaking-off out of gear whilst the strap is travelling from the pulley for producing the slow to that for the quick speed, obviates much trouble. It is accomplished by one small lever which automatically locks and unlocks, and allows the breaking-off cone to get into gear only at the proper time. 4th. An improved arrangement of double-speed motion, consisting of two rims of different diameter, which act alternately as carrier pulleys, on the same shaft, which dispense with the complicated overhead gearing usually resorted to. The double-speed can be put on at any part of the draw. 5th. Double grooved rims which are provided both for quick and slow speed, and the bands are arranged to run double over the tin roller pulleys as well as over the tightening pulley. 6th. The connecting shaft, between the bottom rollers on both sides of the headstock, is arranged so that it can be taken out without disturbing the rollers. 7th. A patent arrangement for driving the drawing-out rolls, independent and separate from the range of wheels for driving the feed or delivery rollers, which enables the speed of the rollers to be altered without disturbing the drawing-out roll, or vice versa. 10th. An improved twist motion that will give any number of turns which may be required; and the changing from one number of turns to another can be done instantaneously, and without change-wheels. Along with this motion is added an adjustable back-backing check motion, which allows the spindle to come to a complete stand before backing-off. This is requisite when spinning on bobbins or making very large coils. As the spindle bands are not all of one tension some spindles run loosely before stopping than others. 11th. The rope taking-in and patent tightening arrangement, which has met with such marked success on the firm's patent cotton mule, is also applied to this mule. The complete carriage is taken in by a rope direct from the counter-shaft, thus avoiding noise and constant breakage of the taking-in gearing usually employed. 12th. The driving of the mule is attended by an 8in. friction with revolving dies or stops into which the change levers acts direct, avoids the additional stops, links, or belt crank levers of the catch boxes usually employed, and brings observations with which we commenced this paragraph.

It has often struck us that in large mills where the aggregate of the waste made is considerable, a single system of this machinery might be introduced with advantage, and especially so when the mill has also a weaving department. Then it could be spun and woven on the spot, and any class of fabric that could be made from it would find custom and fall to the mercantile community of Manchester. But whether this impression be correct or not, the fact is indisputable that a considerable industry of this kind exists upon the Continent and that the raw materials are mainly furnished by this country. If the profit it yields will bear the cost of the transmission of the raw material by land and sea so far, it could hardly fail to be profitable if the business was conducted in Lancashire.

To the waste trade of the Continent we have every confidence in recommending this system of waste machinery as being everything that can be desired for the purpose. Should more information be desired than is here given, Messrs. A. A. Lees and Co. will be glad to give it upon application to them as above, or to their agents, Messrs. Baelein & Co.