

Machinery and Appliances.

WASTE SPINNING MACHINERY.

MESSRS. ASA LEES & Co., LIMITED, OLDHAM.

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 shewing 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 how-

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 reinvested therein, increased the competition and diminished the aggregate profits; at the same time the earnings of the workers were steadily rising. The profit fund 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. To-day, indeed, the trade may be said to subsist upon these, for any mill would now be glad to have as much to share in "divis" as has been saved in economical methods of working and the 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 article, and these have mostly sold it for shipment abroad to Germany, Holland, Belgium, and other parts of the Continent, where under the name of Vigogne and Barchent spinning a considerable industry has been founded, of which wastes form 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

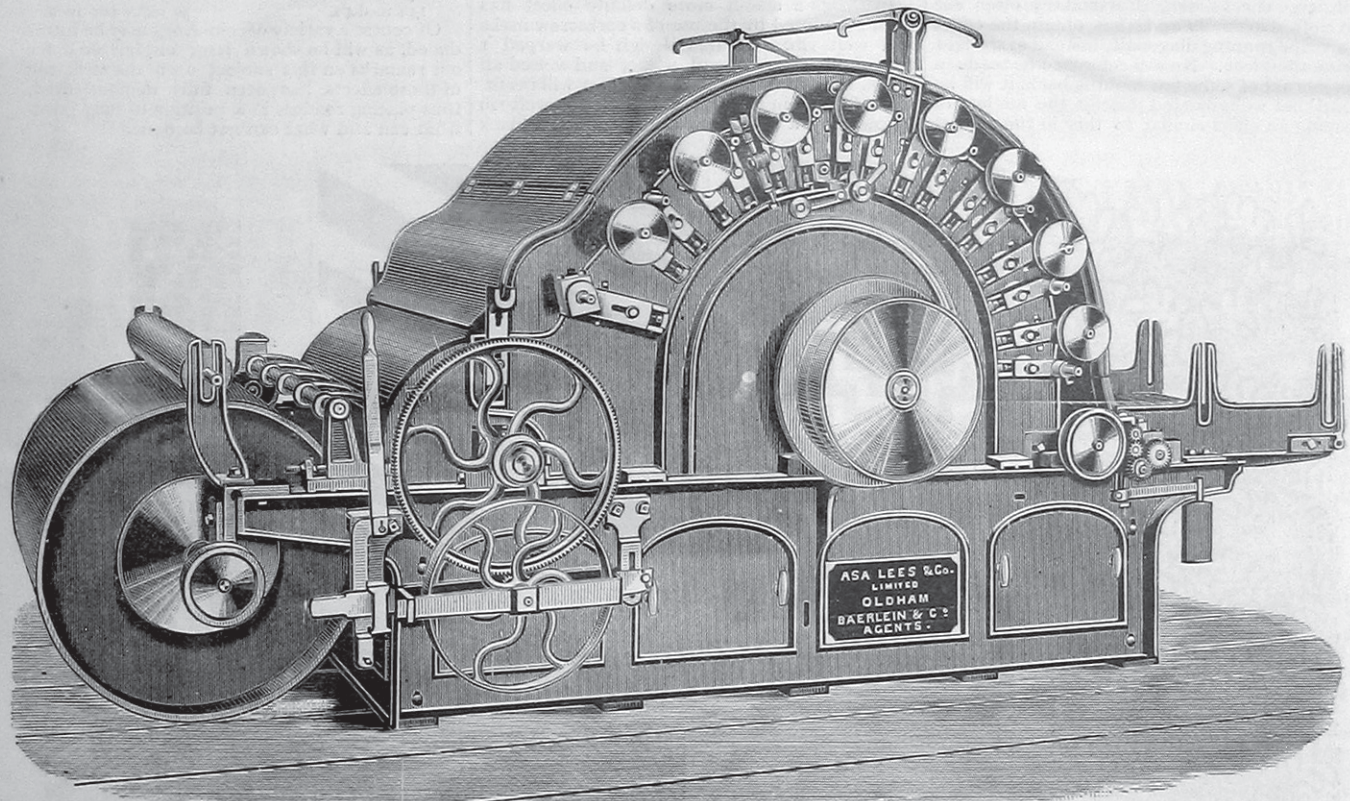


FIG. 1. BREAKER CARD.—MESSRS. ASA LEES AND COMPANY, LIMITED, OLDHAM.

ever 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 Strutts, 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 ever 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

half of the century many a fortune was carted away from the mills to manure the fields in the shape of dust heavily charged with good cotton, from the openers and scutchers. This was piled in great stacks to rot before it could be used. But the last of these has long ago disappeared. Hard waste, soft waste, clean waste, and dirty waste, are now all utilised: if not by the spinner and manufacturer himself, then by subordinate industries which have been built upon their adaptation to useful purposes. Special machinery has been constructed in several cases for this purpose, and it is to a system of waste spinning machinery that we now wish to direct the attention of our readers.

The system to which we refer is constructed by Messrs. Asa Lees and Co., for preparing and spinning the soft wastes of the cotton, woollen, and worsted industries, however short, coarse, and dirty they may be. We illustrate three of the principal machines. They are specially designed and constructed with a view to working up the soft waste cottons produced in our cotton mills: such as blowings,

are only 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 scutcher, in which the material is loosened and disentangled to fit it for the third passage, that of the breaker card. The scutcher 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, it will be seen, is of the roller and clearer type, the most suitable for the treatment of materials on the woollen principle. It is a fine well-constructed machine, in a strong substantial framing. The cylinder is 50 inches diameter and 50 inches across the face on the wire. It has six rollers 6 inches diameter, and dirt-roller of the same size. Its six clearers are $3\frac{1}{4}$ inch 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 taker-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 30 inch drum for the manufacture of wadding. This machine is made 40, 48, or 50 inches wide according to requirement for 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

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 band, 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

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 12's and downwards.

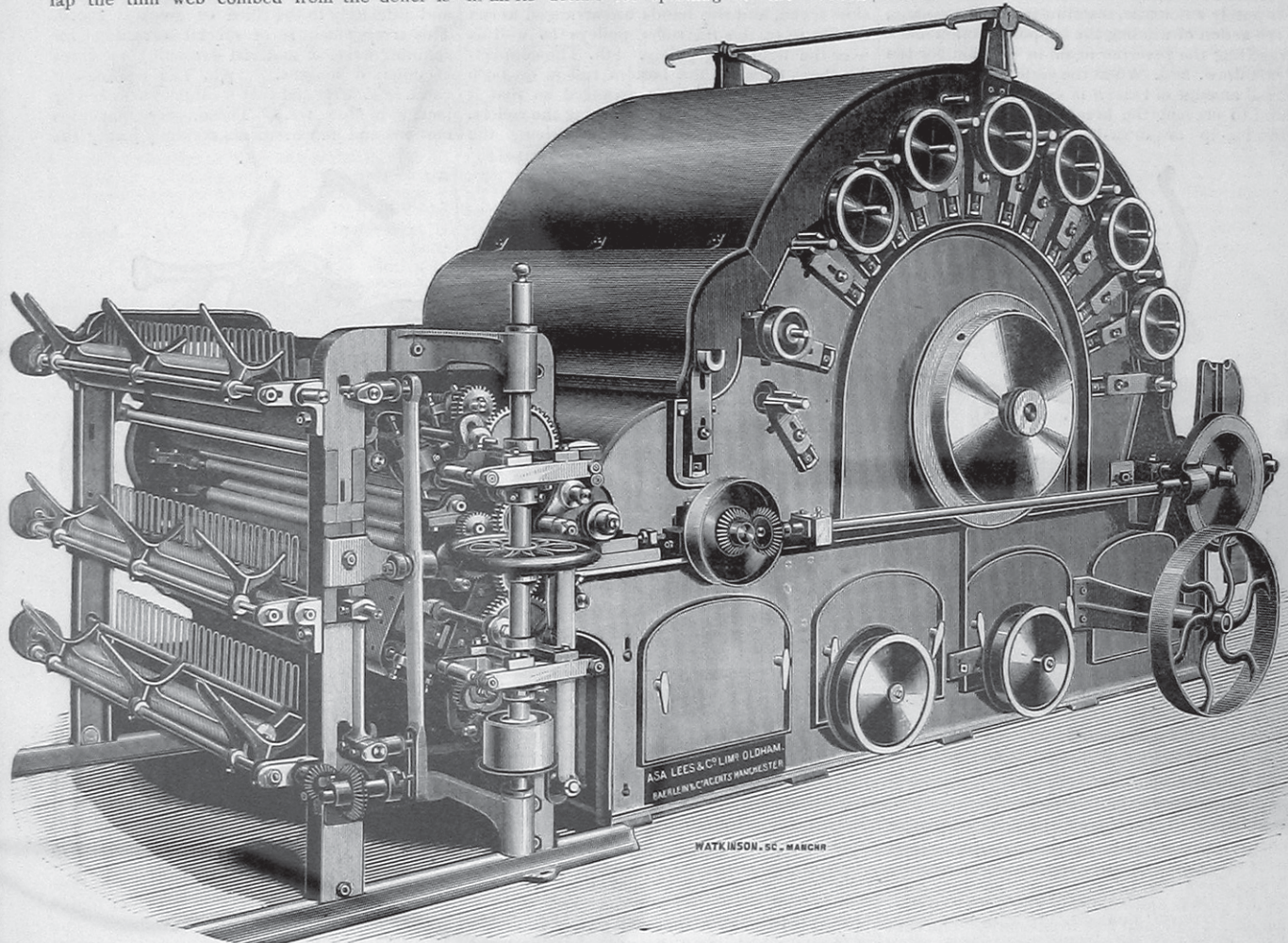


FIG 2. FINISHER CARD, WITH BOLETTE CONDENSER.—MESSRS. ASA LEES AND COMPANY, LIMITED, OLDHAM.

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 Doubler" 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, excepting that it is furnished with rather finer clothing, and instead of the drum for the reception of the material as it is doffed, an improved Bollette condenser is substituted. The card with this attachment is shewn 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

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

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 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 minder. 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 doffing, 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 jacking-up or draw-back motion is applied.

disengages the taking-in motion, and so forth, thus avoiding all breakages. 5th. A patent arrangement for keeping the backing-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 backing-off cone to get into gear only at the proper time. 6th. 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. 7th. 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. 8th. 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. 9th. A patent arrangement for driving the

the wearing parts of the friction out of action except during the actual working of about 2 seconds out of 60. 13th. The improved slubbing motion delivers forward quite accurately and regularly the same lengths of slubbing or unspun yarn for each draw. 14th. The spindle stop-motion, if applied, stops the spindles for any given time at the commencement of the draw. 15th. The patent full cop stopping motions, if ordered, stop the mule when the cops of any desired length are full, and all the cops are then always the size for which the knocking-off stud is set. 16th. A patent third speed arrangement can be applied which enables the spindles to be worked at a slow speed during the first part of draw, which can be increased to a second speed at pleasure, and ultimately to the third or quickest speed. This arrangement is of special advantage for spinning waste or material consisting of fibres of different lengths. 17th. The holding-out catch is so arranged that it cannot be broken by jacking-in too far. These very numerous motions and improvements certainly justify the

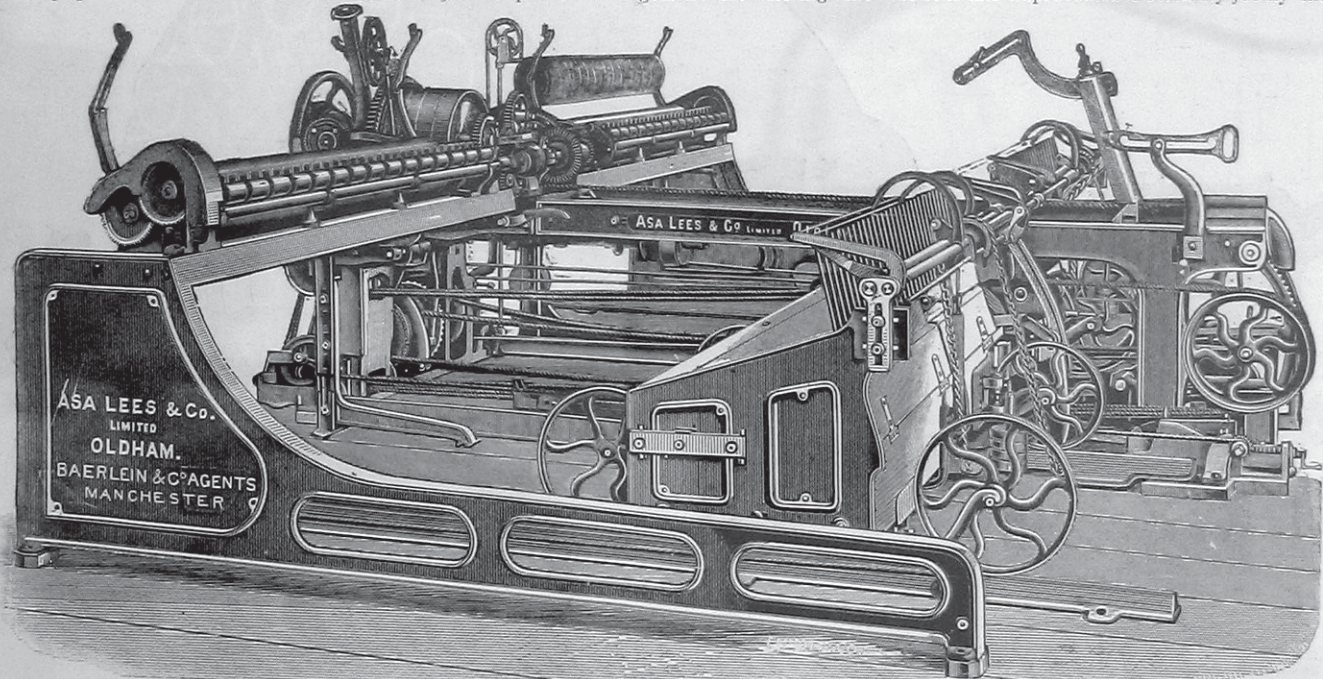


FIG 3. IMPROVED PATENT SELF-ACTING MULE.—MESSRS. ASA LEES AND COMPANY, LIMITED, OLDHAM.

An improved backing-off motion, consisting of a cam shaped to imitate the spiral coils of yarn on the spindles, whereby it brings down the faller wire in the same ratio as the yarn is unwound from the spindles, thus keeping it tight and free from snarls. The cam is governed by a loose incline on the "shaper" or coping rail which varies the backing-off as the building of the cop proceeds, and thus produces a sound cop nose throughout. 3rd. An improved "jacking-up" or draw-back motion requiring no change of wheels or levers, which has a wide range of application in its motions. It can "jack-up" at various speeds, and any distance from nothing up to 6in. In changing the length of "jacking-up," only one change need be made. The quadrant chain is always perfectly tight during the drawing back of the carriage. The winding click is connected to the faller locking motion, and thereby kept out of gear by positive motion until the "jacking-up" is completed. 4th. A patent connection of the drawing-out, taking-in, and backing-off levers which prevents all possibility of two motions coming into gear at the same time. The act of putting the taking-in motion into gear disengages the drawing-out motion, and the putting of the latter into gear

drawing-out scrolls, 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 scroll, 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 backing-off 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 cops. As the spindle bands are not all of one tension some spindles run longer before stopping than others. 11. The rope taking-in and patent tightening arrangement, which has met with such marked success in the firm's patent cotton mule, is also applied to this mule, whereby the 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 cam-shaft shell by an 8in. friction with revolving dies or stops into which the change lever acts direct, avoids the additional stops, links, or bell 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 customers amongst 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. Asa Lees and Co. will be glad to give it upon application to them as above, or to their agents, Messrs. Baerlein & Co.