

Machinery and Appliances.

NEW PATENT EXHAUST COMBINED OPENER AND LAP MACHINE.

MESSRS. ASA LEES AND CO., LIMITED,
OLDHAM.

Cotton opening, rendered necessary by the heavy compression to which the material is subjected in order to facilitate transit, has undergone great improvements during the past few years. Cotton is no longer, in a well-conducted mill, taken from the bale or mixing and in great clods delivered direct to the feed-rollers and beater of the opener. It has now two or three preliminary opening processes to go through before this point is reached. There is first the bale breaker, and then such further pulling asunder as may be given by the hand mixers, though this of course in present conditions is not much. Next there is the feed for the exhaust, in which the opening process is carried

pression roller that delivers it to the levelling or piano motion. Over the top of the latter is fitted a fluted and chased indicating roller, which gears at its extremity with the worm-wheel governing the revolution of the feed rollers and the rate of the forward passage of the cotton, retarding it when the layer is thick, and accelerating it when it is thin. This regulating arrangement is the one in use upon the firm's well-known lap machine, but the diameter of the cones has also been somewhat enlarged. The regulator is driven directly by means of a rope, the driving arrangement being fitted with a tension adjustment pulley. The result is a capability of attaining a very high speed in the cones, and a corresponding improvement in the regularity of the driving. The rope-carrier pulleys to the driving cone drum are fixed in adjustable brackets, by means of which the ropes can easily be kept over the centre of the driving pulley whatever may be its diameter. The makers supply this pulley in any required size, from 6 in. to 12 in. rising by half inches. After passing the regulator, the cotton is received by a second pair of rollers,

reversed when one side has become worn. A series of grid bars are applied to the machine at this point, they being arranged to cover the lower front quarter of the periphery of the roller.

This machine, which forms the first part of the compound one, is well constructed and finished, every care having been exercised to adapt it to the requirements of the labour it has to perform.

The cotton, now very considerably opened, next enters the pneumatic tube. These tubes can be made of any desired length, and elevated, depressed, or carried round angles as needed. The average length in a modern mill is from 70 to 80 ft. But by the improved construction of the fan with which the machine is fitted the makers can confidently recommend the use of a much longer tube where circumstances render it desirable, as they have proved by experience in actual work that it is easily drawn through a length of 140 ft. At the most convenient position in this tube, about 20 feet of improved dust trunks are applied, and as the cotton is being drawn over the grates in these trunks, dust and other impurities are deposited below.

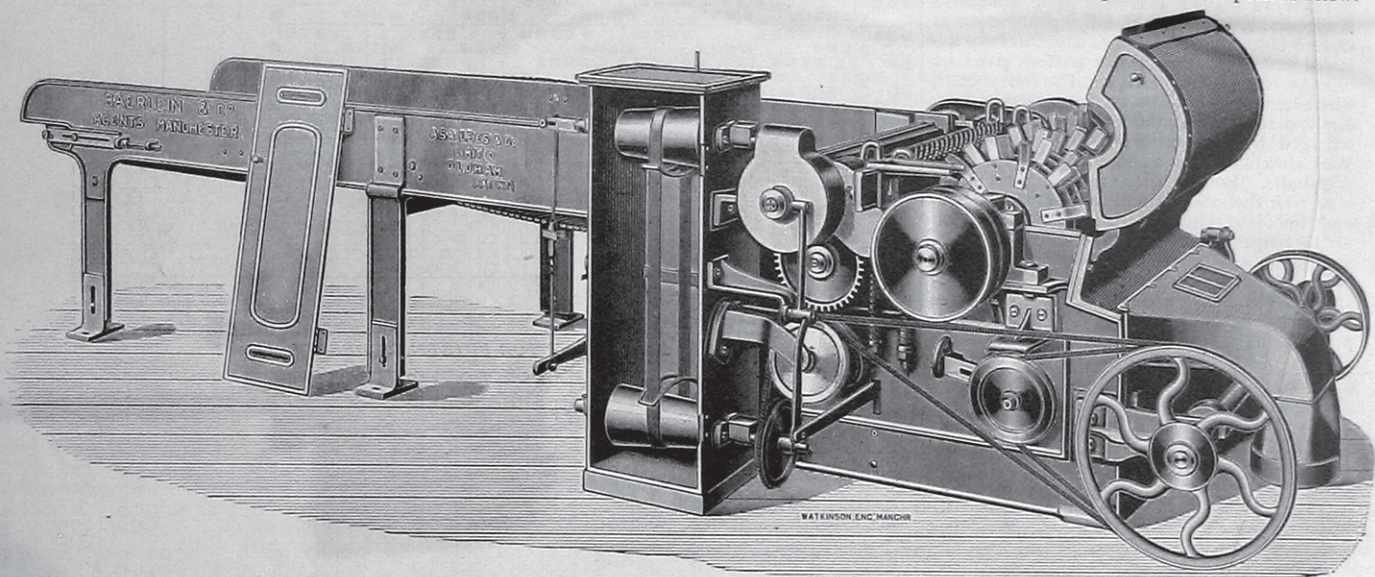


FIG. 1.—MESSRS. ASA LEES AND CO.'S NEW COTTON OPENER. THE NEW COTTON PULLER.

a stage further. This is all so much preliminary work, by which manual labour and the work to be done by the succeeding machines is considerably lightened, both to their own advantage and that of the material. In these details and in the opener itself a great number of improvements have taken place, so that when the total advantages are summed up it will be found that they form no mean portion of what constitutes the progress made in cotton spinning during the past few years.

In connection with this subject we have much pleasure in drawing the attention of cotton spinners and other interested parties to a new patent combined exhaust opener and lap machine, just constructed and now being put upon the market by Messrs. Asa Lees and Co., Limited, machinists, Oldham. By the use of this machine the labour of feeding the breaker lap machine is saved, as the cotton, after being fed upon the lattice, is not handled again until the lap is taken out of the breaker lap machine in the scutching room. The feed lattice, of course, can be made to extend down the centre of the mixing room in front of the mixings, which can be fed upon it at any part. The lattice delivers the cotton to the first part of the new compound machine. This consists of a new design of breaker or pulling machine. In this the cotton is received by a fluted con-

the lower of which is fluted, while the upper is a toothed one. Passing from these the cotton is received by a pair of wrought-iron rollers. The first and second pair of rollers have an equal surface movement or thereabouts. The third pair has a draught of about one in four, thus helping considerably to pull any matted portion of the cotton to pieces. The third and fourth pairs of rollers are driven independently of the regulating rollers; by this arrangement the cones are relieved of considerable work. The cotton is next received by the porcupine cylinder, which is 24 in. in diameter. It consists of twelve strong wrought-iron discs, carried and securely fixed upon a cast-iron shaft by a round nut, the whole being screwed firmly against a boss at the opposite extremity of the shaft. Upon each of these discs are 12 steel teeth, each secured in position by two wrought-iron rivets, the heads of which are cupped and perfectly smooth. The arrangement of the teeth is such that, reckoning from a certain point, the first is bent over so as to be in line with the periphery of the disc, whilst each succeeding one is deflected at such an increasing angle as to form a spiral, which if continued would run off at the opposite end like the thread of a screw. This arrangement secures a full working surface for the roller. The teeth are so constructed that they can be

The improved fan to which we have referred is a double one with six steel wings on each side of the disc. This fan may be run at any speed desired without any risk of breakage, which is a great advantage, as it will enable the cotton, if required, to be brought from much longer distances than usual. So far as yet tried in actual work it has been found that 800 revolutions per minute have been sufficient to meet every requirement. The fan draws the cotton through a divided or branching pipe, each branch serving one side.

The cotton after leaving the fan and passing the above-named dust box is received by a pair of cages, and is next carried between a pair of fluted rollers that deliver it to a porcupine cylinder 18 in. in diameter, constructed in the same manner as the one previously described, but of the full width of the lap. Without this it is difficult, if not impossible, to make a levellap. At the option of the purchaser this porcupine can be substituted by a two or three-winged beater. The series of grid bars fitted here are of novel construction, and are adjustable in respect of either angle or distance. Twelve to thirteen bars can be got into the quarter circle, as against seven or eight of the old type. Leaving here, the cotton next passes a second pair of cages, and is received by another pair of fluted rollers that deliver it to a three-winged

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beater. This beater, at the option of the purchaser, also may be substituted by a porcupine, or their positions may be transposed. The bars in this case are like the last mentioned. Passing the usual dust boxes, the material, now thoroughly opened up, is received by a third pair of cages, from which it is taken by the usual fluted rollers

never be got from manual workers, but also a considerable saving in the cost of labour, which is no insignificant matter when, in these days of severe competition, the most rigid economy is enforced of sheer necessity. On the quality of the material employed, and the high-class workmanship displayed in the construction in the machine it is unnecessary to dilate. It is such as distinguishes all the work turned out by this well-known firm, and for which it has long ago established the highest reputation throughout the cotton spinning districts of the world.

THE Assistant Secretary of the Bombay Native Piece-goods Merchants' Association has communicated the following to the Bombay papers:—"The running freight contract which has been entered into between the Bombay Native Piece-goods Merchants' Association and the agents of the City, Hall, Clan, and Anchor Lines has been renewed by the Association on the 28th day of May, 1891, on the same terms as before, for one year, the said renewal commencing from 1st day of January, 1892, at the following rates:—Manchester to Bombay, 21s. 6d., and 10 per cent. primage; Glasgow to Bombay, 16s. 6d., and 10 per cent. primage, with 8d. per ton return.

amount of colour used also varies with the depth of tint desired, so that no very definite instructions can be given on these points. One thing, however, should be avoided, and that is to use too much colouring matter, which is a fault that is easily committed, but not so easily remedied. As too much colour causes the white to pass into a pale tint of blue, it is best to err on the side of using too little, as colour can always be added, but cannot be taken away.

If the colour of the boiled-off silk is too dark to admit of its being tinted with blue to throw it a white tint, then the silk must be submitted to the bleaching action or process. The method commonly adopted is to bleach by the agency of sulphurous acid, as is done in wool bleaching: the sulphurous acid may be applied either in the form of gas or in solution, either as free sulphurous acid or as bisulphites. Bleaching silk by sulphurous acid gas, or 'stoving' as it is called, is done in large chambers, preferably built of brick, and with a perforated partition above the floor of the chamber; the size varies according to the quantity of silk to be treated at one time. The silk is usually bleached when in the hank form,

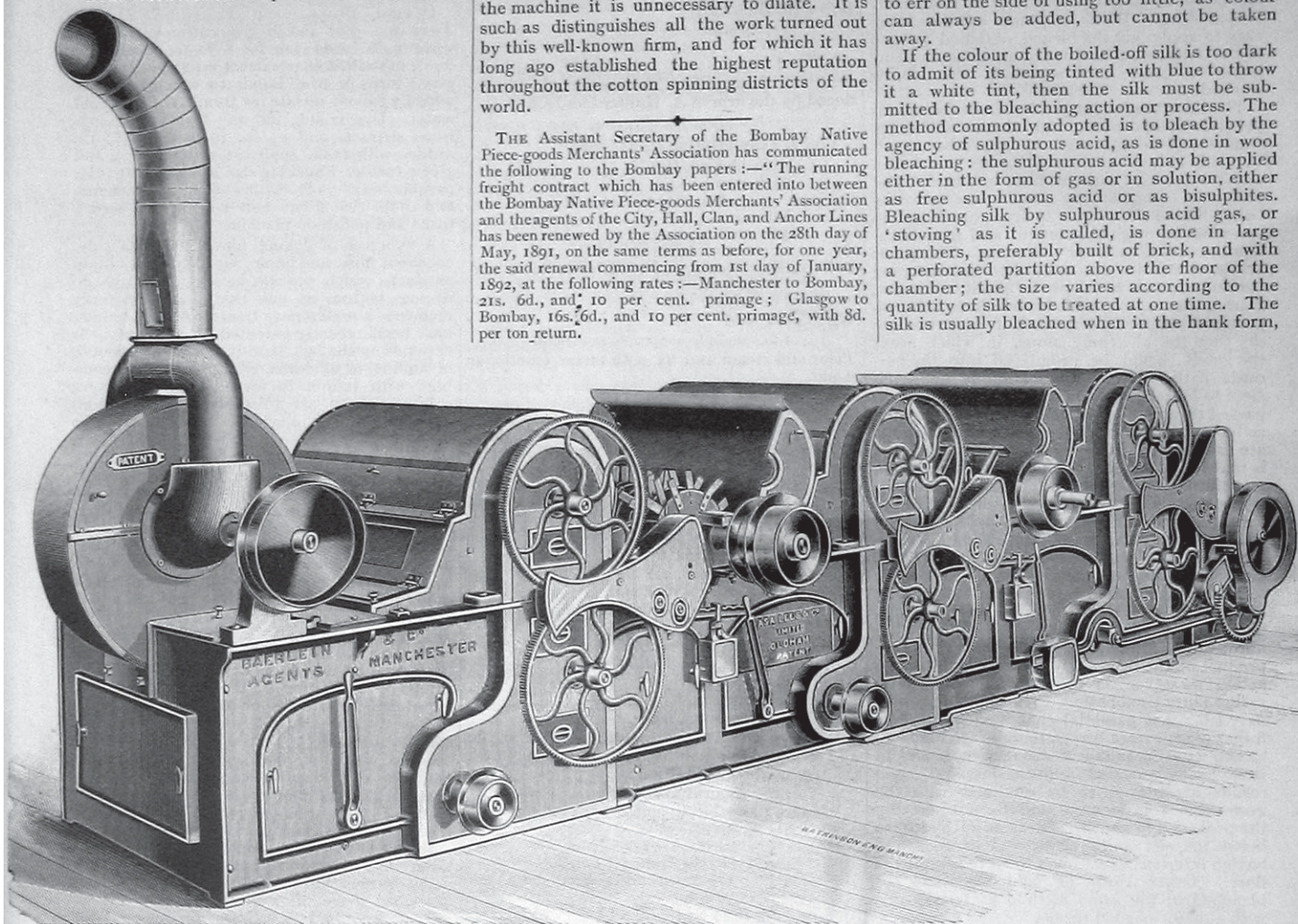


FIG. 2.—MESSRS. ASA LEES AND CO.'S NEW COTTON OPENER.

and delivered to a series of four heavy calendaring and consolidating rollers, and formed into a lap. These, with other minor improvements in details, so compress and solidify the sheet of cotton as entirely to obviate licking of the lap when being unrolled in the next machine.

To each pair of cages fans of an increased diameter have been applied, by which a considerably larger volume of air is obtained, and this with a diminished velocity of revolution. The ends of the calendar rollers are case-hardened, which is an important point considering that 30,000 lb. weight of cotton is easily passed through the machine per week.

After the thorough description given above it will be quite unnecessary to point out to our practical readers that this machine cannot fail to prove thoroughly efficient. Practical tests on a commercial scale have already proved this by the most satisfactory demonstration. Throughout all the successive operations we have brought under the notice of the reader the machine is thoroughly automatic, the material never once having to be handled from its being placed upon the feeder lattice until it is doffed at the lap end of the machine. This implies not only the attainment of the most perfect mechanical regularity, such as can

Bleaching, Dyeing, Printing, etc.

PAPERS ON BLEACHING.—XXII.

(Concluded from page 430.)

Silk Bleaching.—Although, as a rule, the scouring operations described in the last section leave the silk fibre sufficiently white, provided due care has been taken in carrying them out, yet it very often happens that the fibre is not quite white enough. To make it white it is subjected to further treatment, the nature of which depends upon the kind of silk operated upon, the degree of whiteness already attained, and the degree of whiteness required. As a rule the colour will be nearly white, and then it is usually sufficient to, what is called, 'dye' the silk white. This is done by running the scoured or boiled-off silk through a liquor containing a blue colour, such as ultramarine, indigo extract, Prussian blue, soluble blue, or any of the coal-tar blues. Which colour is to be used depends upon the tint of white required; some silk boilers like a bluish white, others a faint greenish blue tint, while others again prefer a reddish cast of blue. The

hanks being hung on wooden rods in the chamber. When this is full all doors are closed up, and a red hot shovel is then placed on the floor of the chamber through an aperture left for this purpose; some sulphur is then thrown upon the shovel, which in burning evolves sulphurous acid gas (sulphur dioxide, SO₂) and this, passing up through the perforations in the partition, acts upon the colouring matter and destroys it. The quantity of sulphur used varies in different works, but usually about 1 lb. is allowed to from 20 to 25 lb. of silk. The operation takes up about five or six hours, after which the silk is taken out of the chambers and thoroughly washed in water to free it from any free acid which may have been formed upon it, and which in time would oxidise to sulphuric acid and rot the silk. The disadvantages of the sulphur method are many: in the first place the bleach is not a permanent one, as after a time the colour comes back, while washing in a little weak alkali or soap also brings it back; then the operation is an unpleasant one, and workmen do not care to have too much to do with it; further, if the supply of air be not sufficient then there is a tendency for some of the sulphur to become volatilised unchanged, which, getting on the silk, turns it yellow, and as this is more likely to happen with those hanks nearest to the perforated partition, it follows that these sulphur stains are liable to be produced in places on the yarn which is being stoved.