March 20, 1928.

J. W. NASMITH

1,663,170

COMBING MACHINE FOR TEXTILE FIBERS

Filed Aug. 1, 1927

Fig: 1.

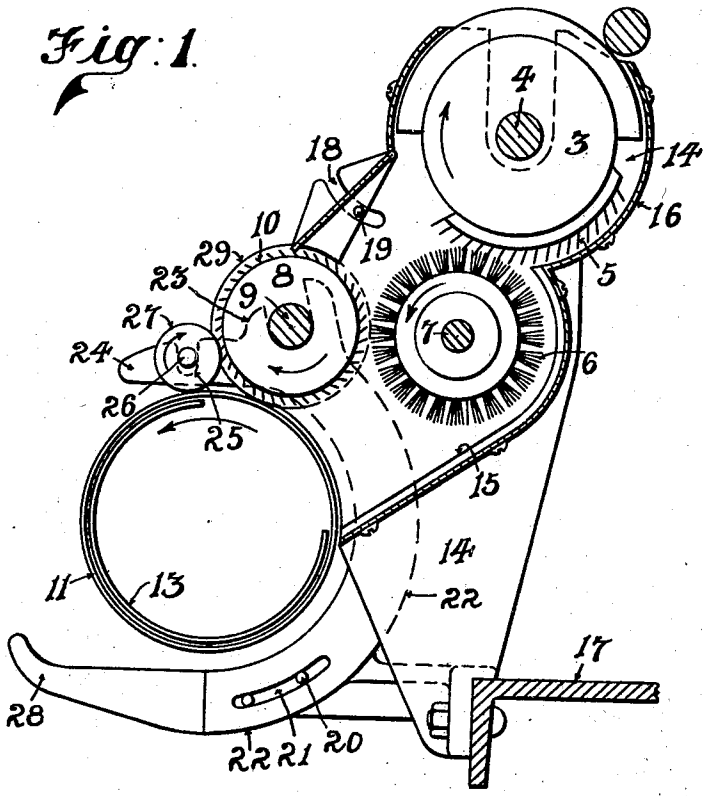
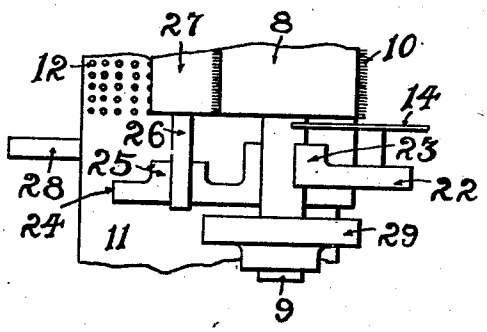


Fig: 2.



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Patented Mar. 20, 1928.

1,663,170

UNITED STATES PATENT OFFICE.

JOHN WILLIAM NASMITH, OF MANCHESTER, ENGLAND.

COMBING MACHINE FOR TEXTILE FIBERS.

Application filed August 1, 1927, Serial No. 209,906, and in Great Britain April 6, 1926.

These improvements relate to combing machines for textile fibers and more specifically to such machines in which the waste material collected by a brush from the combing cylinder or the like is transferred from the said brush to the surface of an aspirator—that is, a rotating perforated or like cage the interior of which is in communication with an exhaust fan or equivalent exhausting means—and retained thereon by the action of the said exhausting means.

Direct removal from the brush of the waste by the fan exhaust to the surface of the aspirator is difficult as the waste clings to the brush bristles and, in an efficient method in use, the brush runs at a high speed and throws the waste off centrifugally and the air current draws it on to the aspirator. This method however entails a high expenditure of motive power, and it is the object of these improvements to provide means for allowing the brush to be run at an ordinary speed whilst still retaining the full efficiency of the aspiratory method of waste collecting.

According to the improvements, in a combing machine wherein the combing cylinder is stripped of waste fibers by a brush to be subsequently removed by an aspirator, a doffing roller is interposed between the brush and aspirator, the doffing roller having teeth which pass in close proximity to the brush to remove the waste therefrom and which teeth pass then adjacent to the aspirator. Means are provided for rotating the doffing roller to bring the waste laden teeth thereof around to the aspirator surface, and for rotatably supporting the said roller.

The improvements in a very suitable arrangement as applied to a Nasmith combing machine will now be described, reference being had to the accompanying drawings, which show sufficient of such a combing machine to allow of explanation of the improvements.

In the drawings:

Figure 1 is a side elevation partly in section of the combing cylinder, the brush, the doffing roller and the aspirator, which latter may be of the usual type as employed in the known Roth aspiratory system for waste removal, and

Figure 2 is a plan of part of Figure 1.

Referring to the drawings, 3 is the usual combing cylinder on its shaft 4 and having the usual toothed segment 5. The usual clearing brush 6 mounted on the shaft 7 makes clearing contact with the segment needles as usual, the cylinder and brush rotating in the directions of their respective arrows. Adjacent to the brush 6 is mounted the metal or other doffing roller 8 fixed on the shaft 9 and having teeth 10 which may be of wire filleting, the relation of the doffing roller centre and brush centre being such that the teeth 10 are always in close proximity to the bristles of the brush 6 as the doffing roller rotates in the direction of the arrow shown thereon. Waste fibers collected by the brush 6 from the cylinder 3, therefore, are cleared from the brush by the teeth 10 of the doffing roller 8 and owing to the continued rotation of the said roller, the waste is passed closely adjacent to the surface of an aspirator 11. This aspirator is perforated on its surface as shown at 12 Figure 2 and has the stationary but adjustable inner damper 13. As in usual practice, the interior of the aspirator communicates with an exhaust fan to draw air radially inwardly of the aspirator through such perforations as are not obturated by the damper 13 as the aspirator tube 11 rotates in the direction of its arrow.

It will be seen therefore that owing to the action of the air current induced by the fan, waste is deposited from the teeth 10 of the doffing roller 8 upon the surface 12 of the aspirator 11 and is then carried round to be removed from the said surface.

To render the air current effective for its purpose and also for keeping the various members clear of particles of waste which might settle thereon vertical side plates 14 are provided at each side of the combing cylinder 3 on which plates are cast the ribs 15 and a sheet iron cover 16 is provided, supported by these plates and extending around the various members as shown. The plates 14 are supported in any convenient manner, but they are shown as secured upon the beam 17. For clearness only one of the plates 14 is illustrated in Figure 1. To allow of removal or adjustment of part of the cover 16, the plates 14 are slotted at 18, set screws or the like 19 engaging in the slots to maintain this cover portion in desired position.

It will be obvious that any means of rotating the doffing roller 8 may be adopted but a very convenient method is illustrated in the drawings which method allows of the easy and exact adjustment when required of the doffing roller in relation to the brush 6.

Upon the doffing roller shaft 9 are mounted by means of their bosses the friction discs or bowls 29 of such diameter as to keep the doffer teeth just clear of the aspirator tube and which are in driving contact with the surface of the aspirator 11. The doffing roller 8 is therefore rotated by the aspirator, as is also the stripping roller 27, and this drive is not affected by desired adjustment of the brackets 22, which are concentric with the aspirator tube.

Upon the plates 14 at either side of the cylinder are formed suitable surfaces to receive the semicircular supports 22 and fitted with screws 20 which engage in slots 21 formed in the semicircular supports 22. These have formed at their upper ends the bifurcated bearings 23 for the shaft 9 of the doffing roller. Each bracket is extended at 24 and formed with open bearings 23 for the shaft 26 of the small stripping roller 27. Adjustment of the supports 22 by the screws 20 will thus ensure that the doffing roller 8 and brush 6 are always in the desired relation and this adjustment does not disturb the stripping roller 27 which remains in contact with the aspirator 11 and in the requisite proximity to the teeth 10 of the doffing roller 8, whilst the latter is easily removable when desired. The ends of the brackets 22 may be formed as shown in Figure 1 at 28, these ends thus forming a receptacle for the doffing roller when the latter with its shaft is removed from its operative position for access to the brush 6, say for inspection or readjustment of the latter.

In addition to the advantage of the saving of power in driving the brush 6, and also the saving of wear and tear thereon consequent upon the decreased speed thereof, it as found that a very slight air current is sufficient to clear the doffing roller teeth 10, with the assistance of the stripping roller 27. The air current may therefore, be reduced considerably, and indeed may only be maintained in a degree sufficient to ensure that the fly shall be kept within the cover and prevented from getting out and settling on the external parts of the machine.

This reduction is further aided by the fact that where the doffing roller is introduced, nearly the whole of the waste is collected on the teeth thereof and does not obstruct the passage of air through the perforations exposed within the casing until it and they reach the stripping position. In the arrangement where the doffing roller is absent, the whole of the waste is drawn on to the perforations immediately they are exposed within the casing covering them completely with a thick layer of waste through which the air must be drawn thus necessitating a high fan speed to maintain the draft and overcome the resistance of the said layer to the passage of the air. The strong current, in addition to requiring power, has the further disadvantage of drawing a certain amount of small dust and fiber through the perforations and fan and blowing it into the room.

By introducing the doffing roller the perforations and the fan speed, may be reduced by half and still suffice to strip the doffer and keep the machine clean.

Each combing head of a combing machine is fitted as above described, and the doffing roller shaft 9 may extend across one or more of such heads. For instance in a complete combing apparatus, the doffing roller shaft may be made in sections, each section having mounted thereon two doffing rollers.

I claim:—

1. In a combing machine in which the combing cylinder is cleared of waste by a brush for the subsequent removal of such waste by means of an aspirator, a doffing roller interposed between the brush and aspirator the said roller having teeth which strip the brush bristles and pass closely adjacent to the aspirator surface; means for rotating the doffing roller; and means supporting the said roller so that it may be bodily adjusted toward and from the brush.

2. In a combing machine having a doffing roller arranged as claimed in claim 1, a stripping roller in contact with the aspirator surface and also in close proximity to the teeth of the doffing roller as and for the purpose hereinbefore set forth.

3. In a combing machine having a doffing roller for stripping the cylinder clearing brush arranged as claimed in claim 1, means for rotating the said doffing roller, comprising friction discs on the shaft of the said roller, which discs are in driven contact with the surface of the aspirator.

4. In a combing machine having a doffing roller for stripping the cylinder clearing brush, arranged as claimed in claim 1, means for supporting the doffing roller, comprising bearings for the roller shaft, the said bearings being adjustable on a circular path around the longitudinal axis of the aspirator substantially as hereinbefore set forth.

5. In a combing machine, the combination with a combing cylinder, of a rotary brush for clearing waste from said cylinder, an aspirator including a rotary drum, arms mounted to rock about the axis of the aspirator drum, a doffing roller supported in bearings in said arms and positioned between the brush and aspirator drum, and a stripping roll supported in bearings in said arms in operative relation to the doffing roller.

6. In a combing machine, the combination with a combing cylinder, of a rotary brush for clearing waste from said cylinder, an aspirator including a rotary drum, arms mounted to rock about the axis of the aspirator drum, a doffing roller supported in bearings in said arms and positioned between the brush and aspirator drum, and means for rotating both the doffing and stripping rollers by the aspirator drum.

In testimony whereof I have hereunto set my hand.

JOHN WILLIAM NASMITH.