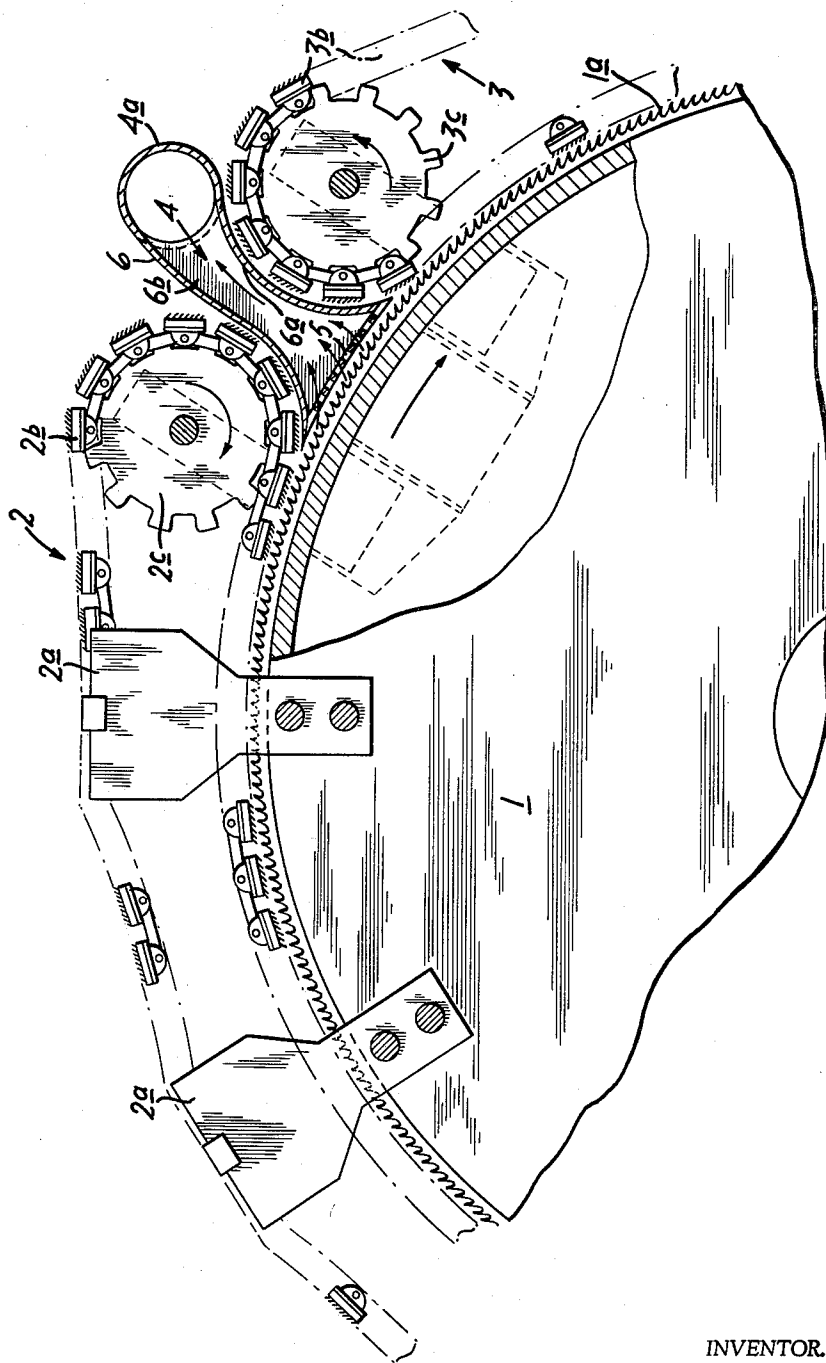


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ARRANGEMENT TO PREVENT LOADING OF MAIN
CYLINDER IN CARDING MACHINES
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ARRANGEMENT TO PREVENT LOADING OF MAIN CYLINDER IN CARDING MACHINES

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This invention relates to machines for carding fibrous material and, more particularly, to a new and improved carding machine arranged to prevent fibers from accumulating at the bottom of the clothing on the main cylinder of the machine.

In conventional carding machines a main card cylinder or swift provided with a toothed clothing on its outer surface collects a layer of fibrous material from a lickerin and carries it on the tips of the teeth past a working member, such as a revolving chain of flat cards, which also has a toothed clothing. During this process the teeth of the working member, which move at a different rate of speed from those of the main cylinder, engage the fibers in the layer carried by the clothing of the main cylinder so as to disentangle them and remove foreign matter. Frequently, however, and especially when the carding machine is operated at high speed, substantial quantities of fiber are compacted at the base of the toothed clothing so that it becomes clogged or loaded and this causes the formation of locks and flocks which impair the quality of the fibrous web produced by the machine. Heretofore, the compacted fibers have been removed from the main card clothing by a rotating wire brush or the like which engages the clothing of the cylinder after the web of fibers has been removed, but this arrangement has not proved satisfactory because the bristles of the brush break easily and the operation of the brush requires constant supervision.

Furthermore, in many carding machines, two or more revolving flat chains or other working members having different types of clothing or different rates of speed are provided in an attempt to reduce loading of the main cylinder clothing. These arrangements have, in general, been unsatisfactory because the mass of air set in motion by rotation of the card cylinder tends to flow away from the main card clothing in the space between the two working members, carrying with it considerable quantities of fibers and dust which create obstructions in the second of the two working members.

Accordingly, it is an object of the present invention to provide a new and improved carding machine which overcomes the above-mentioned disadvantages.

Another object of the invention is to provide a new and improved arrangement for carding machines which prevents the card clothing on the main cylinders from becoming clogged.

A further object of the invention is to provide a carding machine of the above character having two or more working members wherein the space between the working members is effectively utilized and accumulations of dust and fibers is prevented while the second working member is rendered more effective.

These and other objects of the invention are attained by providing, in a carding machine having a rotatable main cylinder and a working member cooperating with the main cylinder, a perforated plate which extends parallel and adjacent to the card clothing located beyond the working member in the direction of rotation of the main cylinder, along with a suction device connected to the perforated plate. Preferably, the machine includes two working members and the perforated plate is located between them. With this arrangement the mass of air set in mo-

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tion by the rotation of the main cylinder escapes through the perforated plate and, in conjunction with the suction applied to the plate, it draws the fibers away from the base of the clothing and out to the tips of the teeth.

Further objects and advantages of the invention will be apparent from a reading of the following description in conjunction with the accompanying drawing which is a fragmentary view, partly in section, illustrating a typical carding machine having an arrangement for preventing loading of the main cylinder clothing according to the present invention.

In the representative embodiment of the invention shown in the drawing, there is a main card cylinder 1 supported for rotation in the direction indicated by the arrow. This cylinder is provided with the usual toothed clothing 1a mounted on its outer surface which picks up a lap of fibers from a lickerin (not shown) and delivers the fibers after processing to a doffer (not shown). In order to disentangle and clean the fibers carried by the main cylinder clothing a first working member, such as a revolving flat chain 2 supported by brackets 2a from the carding machine housing and located along a first portion of the main cylinder surface between the lickerin and the doffer, is provided. This chain is of the usual type comprising a plurality of flat cards 2b which extend the width of the cylinder 1 and it is driven in the direction indicated by the arrow by a sprocket wheel 2c so that the flat cards engage the fibers carried by the clothing 1a to clean them and straighten them out.

Moreover, the carding machine also includes a second working member comprising another revolving flat chain 3 located between the first flat chain 2 and the doffer and driven by a sprocket wheel 3c. If desired, the clothing on the flat cards 3b of this chain may have finer and more closely spaced teeth than those of the cards 2b to provide a greater degree of alignment of the fibers in the lap carried by the main cylinder clothing. Also, the surface speed of the flats 3b with respect to the main cylinder may be different for the two flat chains. For example, the flats 2b may move in the opposite direction with respect to the main cylinder clothing 1a as indicated by the arrow, to provide a relatively high speed differential for the initial carding operation, thereby separating a substantial quantity of impurities from the fibers, while the flats 3b of the second chain 3 may move in the same direction as the clothing 1a but at a lower speed so as to reduce the proportion of waste removed from the lap.

In accordance with the present invention, a perforated plate 5, which extends parallel and closely adjacent to the main cylinder clothing 1a is mounted in the space between the two flat chains 2 and 3 so that it covers substantially all of the main cylinder clothing which is not covered by the flat cards 2b and 3b. This plate forms an end wall of an enclosure 4 which also includes two curved side walls 6 and 6a adjacent to the sprocket wheels 2c and 3c, along with two other side walls, 6b and another wall not visible in the sectional view shown in the drawing extending parallel to the ends of the main cylinder 1. In order to draw air away from the clothing 1a and through the perforated plate 5 a suction duct 4a is connected to the outer end of the enclosure 4.

In operation, the main cylinder 1 and the flat chain drive sprockets 2c and 3c are rotated in the directions indicated by the arrows and suction is applied to the enclosure 4 through the duct 4a. A layer of fibers supplied to the main cylinder by the lickerin and carried by the teeth of the clothing 1a is worked by the flats 2b to align the fibers and remove impurities. In this process some fibers are forced down to the bottom of the teeth of the clothing 1a so that, if sufficient quantities were permitted to accumulate there, the clothing

would become clogged or loaded. As the clothing passes beneath the perforated plate 5, however, the mass of air moving with the clothing is drawn outwardly through the plate by its centrifugal impetus and the suction within the enclosure 4. This pulls the fibers from the bottom of the clothing outwardly as far as the tips of the clothing teeth, the perforated plate 5 being effective to prevent the fiber layer from becoming detached from the teeth. As a result, when the fiber layer is subsequently taken off by the doffer substantially all of the fibers are removed from the clothing. Moreover, the fiber layer, having been raised to the tips of the teeth, is worked more efficiently by the flats of the second chain 3. An additional advantage of the arrangement of the present invention is that it provides an extra cleaning operation because fine dust particles and fly are sucked through the perforated plate 5 and are thus removed from the fiber layer.

Although the invention has been described herein with reference to a specific embodiment, many modifications and variations therein will readily occur to those skilled in the art. For example, more than two flat chains or other working devices may be provided and a perforated plate 5 and suction enclosure 4 may be mounted between each adjacent pair of chains or, if desired, the perforated plate and suction arrangement may be provided at the end of a single flat chain. Accordingly, all such variations and modifications are included within the intended scope of the invention as defined by the following claims.

I claim:

1. In a carding machine having a rotatable main cylinder provided with a toothed clothing and a working member adjacent to the clothing for working a layer of fibers carried by the clothing of the main cylinder, a device for preventing the clothing from becoming clogged comprising means forming a fixed perforated surface mounted closely adjacent to the clothing at a location beyond the working member in the direction of rotation of the main cylinder and having a plurality of perforations disposed across the width of the main cylinder, and means

to direct air through the perforated surface and away from the clothing to draw fibers therewith toward the tips of the clothing teeth.

2. A carding machine according to claim 1 wherein the means forming a perforated surface comprises an enclosure including a perforated end wall located parallel and closely adjacent to the main cylinder clothing and a side wall located closely adjacent to the working member.

3. A carding machine comprising a rotatable main cylinder provided with a toothed clothing, at least two working members adjacent to the clothing and angularly spaced therealong for working a layer of fibers carried by the clothing of the main cylinder, and a device for preventing the clothing from becoming clogged comprising means forming a fixed perforated surface mounted closely adjacent to the clothing at a location between the two working members and having a plurality of perforations disposed across the width of the main cylinder, and means to direct air through the perforated surface and away from the clothing to draw fibers therewith toward the tips of the clothing teeth.

4. A carding machine according to claim 3 wherein the working members are revolving flat chains.

5. A carding machine according to claim 3 wherein the means forming a perforated surface comprises an enclosure including a perforated end wall located parallel and closely adjacent to the main cylinder clothing and a pair of opposite side walls located closely adjacent to the two working members respectively.

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