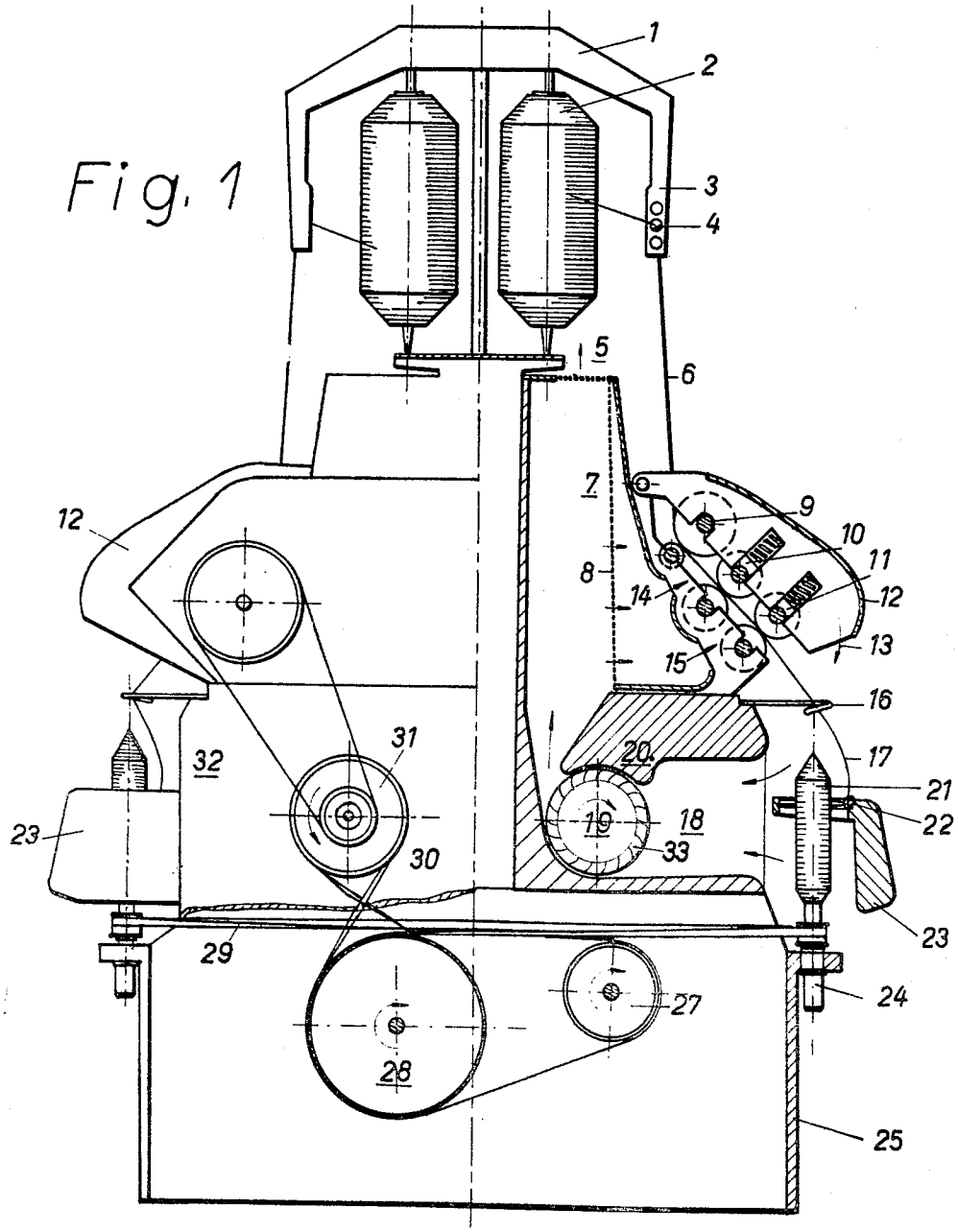
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ACCESSORY FAN FOR TEXTILE MACHINES

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Fig. 1



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ACCESSORY FAN FOR TEXTILE MACHINES

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10 Claims. (Cl. 57—56)

The object of this invention is an installation in textile machines for producing air currents for continuously cleaning, during operation, the machine itself and the textile goods manufactured by the machine.

Textile machines need equipment to set up air currents particularly for drawing off loose fibers and broken threads by suction, filtering dusty air, creating a uniform air climate both within the machine and in its vicinity, cleaning machine parts whose functions would be impeded by loose dust or fibers, and finally for cleaning the textile goods themselves.

The requirements demanded of such installations for producing air currents in textile machines are numerous and varied. The air speed necessary should be uniform over the entire active breadth of the machine, and continuous in time. Known installations such as over-head cleaners suffer from the disadvantage of only intermittent operation. Known installations of the continuously operating type do not combine the operations of cleaning and drawing off broken threads. The air speed has to be finely adjusted in order to obtain a maximum suction effect with a given permissible air speed. Further, the fan installations should fit easily into the textile machine without demanding extra space. The necessary ducting system should be as short and wide as possible for minimum pressure losses and easy accessibility for cleaning. Also the suction openings available should be large enough to ensure efficient coverage, by moving air, of the textile manufacturing operations which extend over a large portion of the machine.

The installations so far used with textile machines do not satisfy these various requirements simultaneously. The production of a homogeneous air current covering the entire active breadth of a textile machine with low pressure losses and simple ducting has been impossible with the equipment prior known for this purpose of producing air currents, because with the types of fans used so far the air had to be coerced into a fan cross-section which was very small compared to the active breadth of the textile machine. Therefore, ducting installations with large changes of cross-section and numerous bends had to be used for distributing the negative or positive pressure created by the fan over the whole active breadth.

The basic problem to be solved by the present invention was to eliminate the above-mentioned structural and fluid-mechanical disadvantages of having to distribute, by special means, the fan action over the active breadth of the textile machine. According to the present invention this problem has been solved by using a fan in which the air enters the rotor in a direction perpendicular to the rotor axis, with a casing which is shaped such that the air enters the rotor over part of its circumference and, after having traversed the interior of the rotor, leaves the latter through another portion of its circumference, the fan being installed in the textile machine such that the rotor axis extends in the direction of the active breadth of the textile machine.

In order to obtain a uniform air current over the entire active breadth of the machine the rotor should extend at least over 30%, and sometimes over 100%, of the active breadth of the textile machine. According to this invention the fan makes it possible, in a simple way, to place the rotor in the immediate vicinity of the elements of the machine participating in the actual textile work process.

Other objects and advantages of the invention will be more apparent to those skilled in the art from the following description of the appended drawing showing a section through a ring spinning machine with fixed spindle bank incorporating a fan of the type in accordance with this invention.

The yoke 1 guides a number of feed spools 2 whose threads 6 are pulled therefrom by way of the thread guides 4 in the yoke shank 3. The feed spools 2 and their surroundings are supplied by a current of filtered air through the screen at 5. At the roller 9, the thread 6 enters a system of drawing rollers and is drawn out by the system of pre-loaded rollers 10 and 11 which run at a higher speed. In this system of drawing rollers loose fibers accumulate, torn loose by the drawing process. This loose fiber material is whirled around by air from the nozzles 14 and 15, is removed from the drawing rollers and leaves the casing 12 covering the drawing roller system, at port 13. The nozzles 14 and 15 extend as slits over the working breadth from the drawing rollers. The air laden with the fibers blown off the drawing roller system passes toward, and enters, the suction inlets 18, traverses the fan rotor 19 and is pumped into the space 7. When the air again leaves through the nozzles 14 and 15, the fibers are held back by the screen 8.

The thread, when leaving the drawing rollers, passes through the thread guide 16 and, in the form of the loop 17, reaches the flyer 22, from whence it is coiled on the high-speed coiling spool 21. In this type of textile machine the flyer bank 23 oscillates up and down and thus causes the thread to coil on the coiling spool 21 in regular layers.

If the thread breaks, the loose thread fed from the drawing roller system may become tangled either in its coiling spool or in adjacent coiling spools and may thus cause severe trouble. The installation according to the present invention and shown in the enclosed drawing produces a sufficiently strong, uniform air current at the inlet 18, such that the broken thread is sucked away from the system of coiling spools.

The coiling spool 21 is driven by the belt 29. The coiling spool bearings 24 are located in a continuous beam 25. The belt 29 is driven and stretched by the main drum 28 and the auxiliary drum 27. The pulley 31 is driven by the belt 30 from the main drum 28. This pulley 31 drives a second fan which is identical to the first one, 19 of the other half of the spinning frame, both rotors being located behind the end plate 32 thereof.

The continous main beams of the spinning machine are designated by the numeral 20. The fan rotor 19 extends over the entire active breadth of the spinning machine shown in, and perpendicular to, the drawing. As shown in the drawing, the inlet duct 18 is very short, such that the air speed is essentially uniform. A particular advantage of the arrangement described results from the location of the fan completely inside of the textile machine, without bulky ducting installations which would extend beyond the contours of the machine. Thus the air from the screen 8 can be ducted directly, and without losses, to the nozzles 14 and 15 and thereby to the drawing roller system. At the same time a uniform climate is created throughout the entire textile machine, in that the air leaving at 5 ventilates the feed spools 2 with air from the region 7.

The ring spinning machine with fixed spindle bank, as shown in the drawing, could not successfully be provided with fixed suction inlets for eliminating troubles caused by broken threads, since the air current necessary in the high space, in which the flyer bank 23 oscillates up and down, could not be produced economically. Due to the very low power losses and high delivery efficiency of the fan, as well as to its uniform effect over the entire active breadth, the instant invention provides an economical and efficient thread suction installation in textile machines of this type.

As will be apparent to those skilled in the art, installations as described in this invention, can be further applied, aside from ring spinning machines, as exemplified above, to numerous other textile machines of various types, such as looms, twining machines, bale openers, winding machines, flyer spinning machines; in short, wherever problems such as thread suction, uniformity of climate, drawing off pile and fibers by suction, cleaning and drying textile goods extending or spred over a given active breadth of the textile machine are to be overcome.

What I claim is:

1. Blower means for producing continuous air currents in textile machines of the type including supply reels, drawing rollers, and coiling reels comprising a rotatable fan of which the axis is parallel to the longitudinal axis of the textile machine, a housing for the fan in the machine frame, a suction port for the fan adjacent to the coiling reels of the machine, a compression chamber receiving the output from the fan, a first series of outlet ports from the compression chamber directing output air to and through the drawing rollers of the machine, a formed cover over the drawing rollers for deflecting the air stream passing from the first series of outlet ports and through the rollers toward the suction port, a second series of outlet ports from the compression chamber directing output air to and about the supply reels, and means for driving the fan.

2. Blower means according to claim 1 in which the axial length of the fan is substantially equal to the working breadth of the textile machine.

3. Blower means according to claim 1 in which the axial length of the fan is at least 30% of the working breadth of the textile machine.

4. Blower means according to claim 1 in which each series of outlet ports is so positioned as to direct the ejected air stream transversely of the fan axis.

5. Blower means according to claim 1 in which a screen in the compression chamber in advance of each series of outlet ports retains the foreign particles drawn into the suction port with the intake air.

6. Blower means according to claim 1 in which the fan is of such configuration, and the driving means drive the fan at such speed that the air from series of outlet ports discharge the outlet air at a speed to remove loose fibers from the thread being processed in the drawing rollers.

7. Blower means according to claim 1 in which the fan, its inlet port and its outlet ports, are all located in the frame at portions thereof free of the supply reels, the drawing rollers and the coiling reels.

8. Blower means according to claim 1 in which the fan is of such configuration, and the driving means drive it at such speed, that the air flowing into the suction port will deflect the loose ends of a broken thread from its associated coiling reel.

9. Blower means for producing continuous air currents in textile machines of the type including coiling reels and thread drawing roller systems comprising a pair of rotatable fans of each of which the axis is parallel to the longitudinal axis of the machine, each fan being to an opposite side of the longitudinal middle of the machine, and each fan having a housing in the machine, an associated suction port and duct adjacent to the coiling reels on that side of the machine, a compression chamber receiving the fan output, a first series of laterally extending outlet ports from the compression chamber directing output air to and through the thread drawing roller systems on that side of the machine, and a second series of upwardly directed outlet ports from the compression chamber directing output air to supply reels at the top of the machine on that side of the machine, and driving means common to both fans for rotating them.

10. Blower means according to claim 9 in which each threading drawing roller system has a formed cover for directing the output air from the first series of outlet ports after passage through the roller system toward the suction port, and the fan is of such configuration and rotated by the driving means at such speed that the output air from the first series of outlet ports will remove and carry with it any loose fibers and dust from the thread drawing roller system, and the suction at the suction port will be sufficient to deflect the broken ends of a thread between the drawing rollers and the coiling reels from the associated coiling reel.

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