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ADJUSTABLE BOOT NOZZLE

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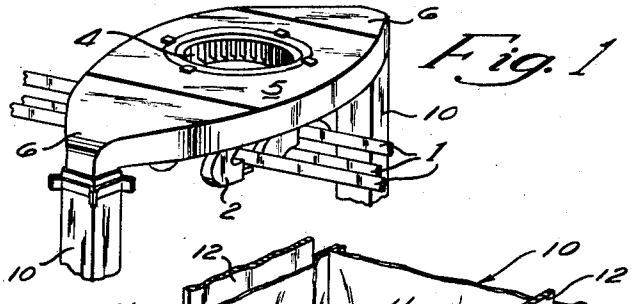


Fig. 1

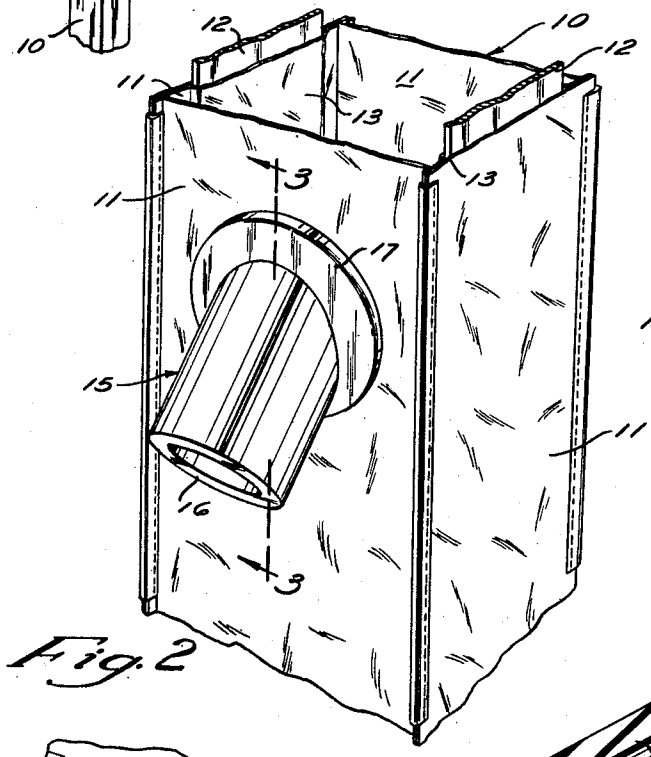


Fig. 2

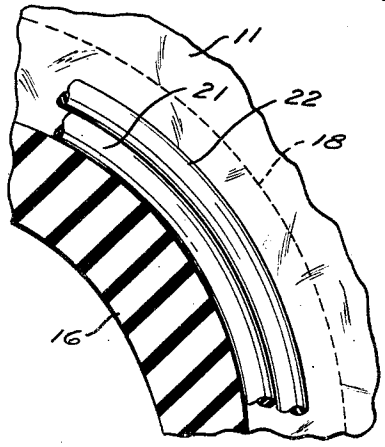
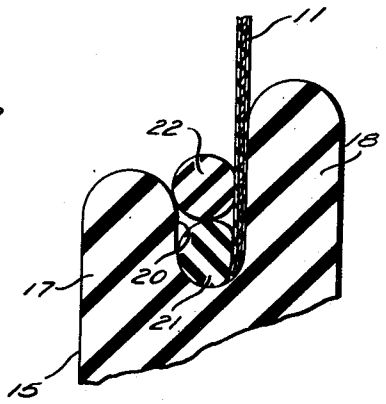


Fig. 5

Fig. 4



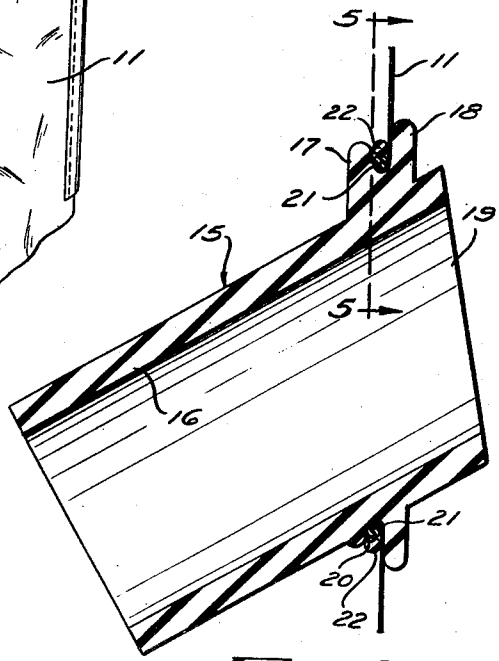


Fig. 3

INVENTOR.
LOYD R. McEACHERN

BY
WATTS & EDGERTON
R. D. Watts
ATTORNEYS

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ADJUSTABLE BOOT NOZZLE

Loyd R. McEachern, Greenville, S.C., assignor to The American Mono Rail Co., Cleveland, Ohio, a corporation of Ohio

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5 Claims. (Cl. 239—547)

This invention relates to the art of removing fibers from textile machines and is particularly concerned with a new tube or boot having outlets through each of which air can be directed in any one of many different directions.

Heretofore, apparatus for removing lint from textile machines, for example spinning machines, has included elongated flexible tubes extending downwardly from an overhead casing to receive and direct air downwardly alongside of the machine. These elongated tubes, often called "boots," have been provided with vertically elongated openings in the side wall opposed to the machine to be cleaned, these openings serving as outlets through which parts of the downwardly moving high velocity stream of air could escape and flow into contact with parts of the machine and dislodge lint therefrom. The tubes or boots were positioned to move in fairly close proximity to the sides of the machines, for example close to the pigtails of a spinning machine, and since these tubes or boots could move to a limited extent toward the side of the machine, there was danger that part of the machine might enter some of these holes and tear the tube or even dislodge it from the overhead supporting casing. Moreover, the holes formed in the side of the tube afforded no means for varying at will the direction of the stream of air flowing therethrough.

The present invention aims to provide a boot having air outlet nozzles which are not susceptible to being snagged by parts of the machine and which may be readily adjusted to direct the stream of air issuing therethrough into any one of a plurality of directions. The present invention achieves these objects by providing a nozzle having a flange near one end thereof in a plane at an acute angle to the center line of the nozzle, and means to retain against the flange the part of the boot surrounding the opening through which the nozzle projects.

The present invention will be better understood by those skilled in the art from the following specification and the drawing accompanying it in which:

Figure 1 is a fragmentary perspective view of apparatus with which the present invention may be employed;

Figure 2 is a fragmentary perspective view of a preferred form of the present invention;

Figure 3 is a cross-sectional view taken on line 2—2 of Figure 1;

Figure 4 is an enlarged fragmentary sectional view of a portion of Figure 2 showing the relative position of the nozzle, a wall of the boot and the means to retain that wall in the groove of the nozzle, and

Figure 5 is a fragmentary enlarged sectional view taken on line 4—4 of Figure 2.

In Figure 1 is shown apparatus with which the present invention may be employed. There, three rails 1 constitute a track on which carriage 2 is supported for travel, and this carriage has mounted thereon a fan 4 to be rotated by a motor (not shown) and a casing or housing 5 surrounding the fan and having opposite outwardly and downwardly extending conduits 6. It will be understood

that air is drawn through the upper side of casing 4 and into the interior of fan 4 whence it is propelled outwardly and down through conduits 6.

In Figure 2 is shown fragmentarily part of one of the two tubes or boots which, at their upper ends, are to surround and be attached to conduits 6. Since the boots are constructed similarly, a description of one will suffice for both.

Tube or boot 10 as shown is preferably rectangular in cross section and has four walls 11. Any other cross sectional shape which is suitable may be employed as those skilled in the art will understand, and while walls 11 are preferably constructed of reinforced fabric impregnated with rubber to prevent flow of air therethrough, it will be understood that these walls may be composed of other suitable material which will retain and direct the stream of air downwardly through the tube. Also slats 12 may be located in pockets 13 in the leading and trailing sides of the tube 10 to permit bending of the tube in directions parallel to the tube travel but will resist bending in directions normal to the machine to be cleaned.

The side wall 11 of the tube which is opposed to the machine from which line is to be removed is provided with a plurality of disc-shaped holes through each of which a nozzle 15 projects. As many nozzles may be used as are needed or desired to direct air streams against the predetermined places on the machine to be cleaned. The nozzle 15 comprises a tube 16 having two annular ribs 17 and 18 projecting therefrom adjacent to one end thereof and disposed at an acute angle to the longitudinal center line of the tube. These ribs are spaced apart and form a groove 20 therebetween. The nozzle 15 may extend outwardly from the wall 11 as far as is desired or may stop flush with the outer rib 17, and may extend into the tube as far beyond the rib 18 as is desired. The nozzle may be cut away within the tubes as indicated at 19 to serve as a scoop to intercept part of the air stream and direct it through the nozzle. When the nozzle is to be assembled with the side 11 of the tube, the nozzle is pushed through the hole in wall 11 so that rib 18 is within the tube and bears against the inner surface of wall 11 around the hole therethrough with that wall projecting into groove 20. The nozzle and wall 11 are maintained in such assembled position by two O-rings 21 and 22 which lie in groove 20. O-ring 21 is preferably slightly smaller in inside diameter than the diameter of the groove 20 and O-ring 22 has an inside diameter preferably slightly smaller than the outside diameter of ring 21. Thus, when these rings are in assembled position as shown in Figure 4, both rings are in tension and press inwardly in the groove and are deformed laterally so as to press against wall 11 and retain the nozzle in its assembled position.

It will be understood that while Figure 2 shows the nozzle 15 in position to direct a stream of air downwardly at an acute angle to the center line of the tube, the position of the nozzle may be readily changed by simply removing rings 21 and 22, rotating the nozzle 15 relative to the wall 11 to the desired extent and in the desired direction, and then replacing the rings 21 and 22 in the groove. Thus, when the plurality of nozzles 15 are employed in one tube, air may be directed at an acute angle to the longitudinal axis of the boot and in almost any position throughout a complete circle although the amount of air flowing through a nozzle varies somewhat depending on the position of the tubular part 16 of the nozzle. For example, if the nozzle points upwardly, less air may be expected to flow through it than when the nozzle points downwardly because the direction of the air flow in the boot is downwardly and hence more of it would tend to

enter and flow through the nozzle when it extends in the same general direction.

Since the nozzles **15** are adjustable, they may be so positioned, where there is danger that they might be snagged by a part of the machine, that such snagging would be impossible. For example, a nozzle positioned at the level of the pigtails could be adjusted to blow the air backwardly and thus present the sloping surface of tube **16** to the pigtails which would not snag the nozzle but would slide over that inclined surface. Furthermore, the use of this invention makes it possible to remove lint from substantially all parts of a machine because the several nozzles or some of them may be re-adjusted from time to time to direct the air streams against other parts of the machine not through being contacted by the air streams. In addition to these advantages, the present invention makes it possible readily and easily to assemble, disassemble and adjust one or more of the nozzles in the boot as may be desired.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, we state that the subject matter which we regard as being our invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. In apparatus for removing lint from textile machines, an elongated tube having a side wall provided with a nozzle hole and adapted to be moved along and in proximity to a side of the machines, said tube being composed of flexible material and adapted to direct downwardly an air stream traveling therethrough, a nozzle extending through said hole in said wall of the tube and having an annular rib disposed at an acute angle to the longitudinal axis of the nozzle and bearing against the inner surface of the tube, and means for retaining the nozzle in assembled position with said wall, said retaining means including resilient means surrounding the nozzle and pressing said wall against the outer surface of said rib with nozzle-retaining contact.

2. In apparatus for removing lint from textile machines, an elongated tube having a side wall provided with a nozzle hole and adapted to be moved along and in proximity to a side of the machines, said tube being composed of flexible material and adapted to direct downwardly an air stream traveling therethrough, a nozzle of flexible material extending through said hole in said wall of the tube, and means for retaining the nozzle in assembled position with said wall, said retaining means comprising an annular rib on the nozzle within the tube and engaging the inner surface of said side wall around said hole, an annular rib on the nozzle outside of the tube, said ribs being substantially parallel and being disposed at an acute angle to the longitudinal axis of the nozzle, and resilient means around the nozzle between the ribs and pressing said wall against a surface of one of said ribs with nozzle-retaining contact.

3. In apparatus for removing lint from textile machines, an elongated tube having a side wall provided with a nozzle hole and adapted to be moved along and in proximity to a side of the machines, said tube being composed of flexible material and adapted to direct downwardly an air stream traveling therethrough, a nozzle extending through said hole in said wall of the tube, and means for retaining the nozzle in assembled position with said wall, said retaining means comprising annular ribs on the nozzle disposed at an acute angle to the longitudinal axis of the nozzle and forming a groove therebetween into which projects the portion of said wall around said hole, and means in the groove engaging and pressing said wall against the nozzle with nozzle-retaining contact.

4. In apparatus for removing lint from textile machines, an elongated tube having a side wall provided with a nozzle hole and adapted to be moved along and in proximity to a side of the machines, said tube being composed of flexible material and adapted to direct downwardly an air stream traveling therethrough, a nozzle extending through said hole in said wall of the tube and having annular, spaced, outwardly projecting ribs disposed at an acute angle to the longitudinal center line of the nozzle and forming a groove therebetween into which projects the portion of the said wall around said hole, and means for retaining the nozzle in assembled position with said wall, said retaining means comprising two concentric resilient O-rings under tension in the groove and pressing said wall portion against one of said ribs with nozzle-retaining contact.

5. The combination of a wall having a hole therethrough, a hollow cylinder extending through said hole and having spaced annular ribs disposed at an acute angle to the longitudinal axis of the cylinder and lying adjacent to the inner and outer surfaces of said wall and forming a groove into which the portion of the wall around said hole extends, and means for retaining said wall and cylinder in assembled position including concentric, resilient O-rings under tension in said groove and pressing said wall tightly against one of said ribs.

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