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MONITOR CLEANER

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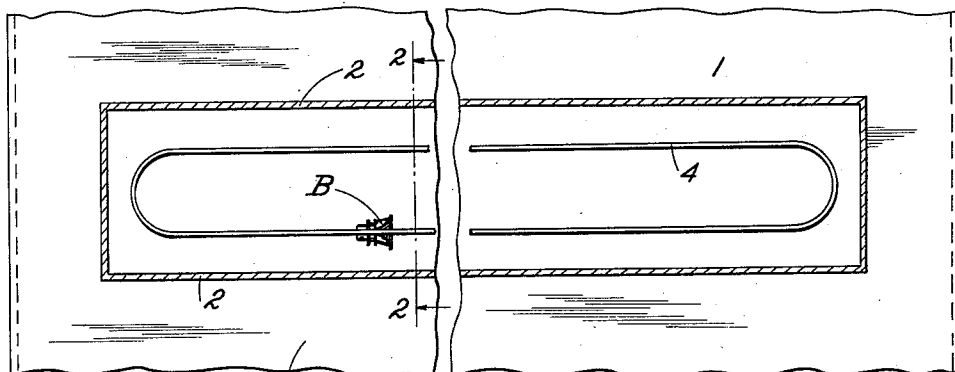


Fig. 1

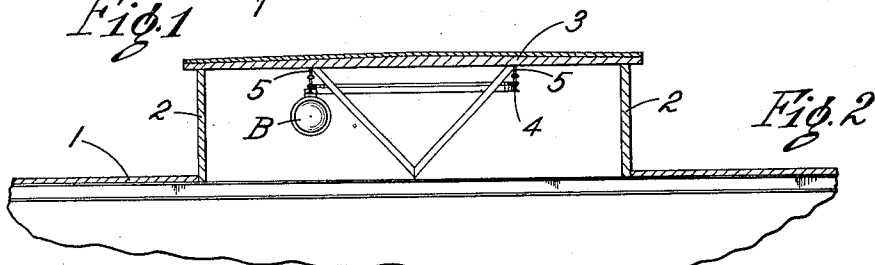


Fig. 2

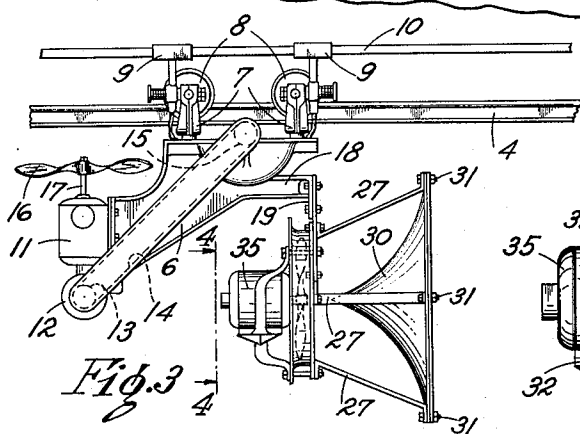


Fig. 3

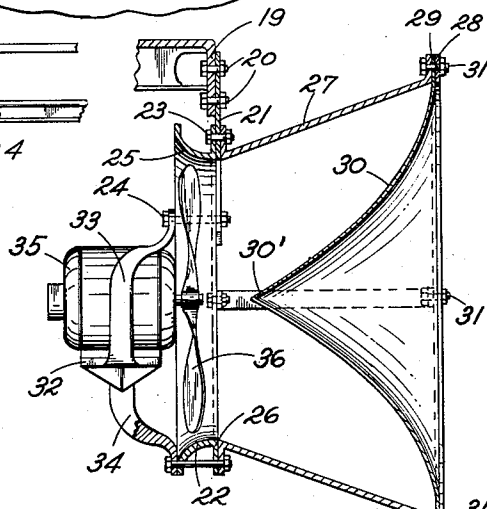


Fig. 5

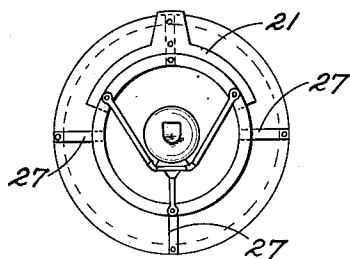


Fig. 4

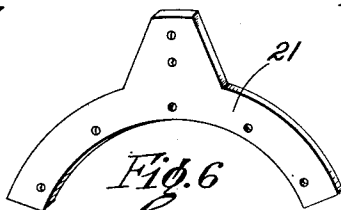


Fig. 6

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MONITOR CLEANER

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3 Claims. (Cl. 230—253)

This invention relates to apparatus for the prevention of the deposition and collection of dust or other air carried particles and more particularly to apparatus for preventing the accumulation of lint, fly, loose fibers, dust, etc., within a monitor structure, saw tooth roof structure or high ceiling of a textile mill.

It is common practice in textile mills to provide a blowing device mounted to travel on an overhead track which extends above the machines in the mill, the blower being adapted to discharge a blast of air downwardly on to the machines as it travels along the track. Such an arrangement prevents the accumulation of dust and fly on the machines. However, in many textile mills the roof structure includes elongated monitors, generally rectangular in cross section, which project up above the normal roof level. After a period of mill operations dust and lint frequently collect in these monitors in such quantities that it may drop down on the machines below the monitors and be scattered through the mill where it becomes attached to or twisted into the yarn forming undesirable lumps, gouts, bunches, etc.

It may be possible to prevent the harmful accumulation of dust and lint on the main ceiling of the mill by means of upwardly directed air blasts from the machine cleaning blowers. However, such blasts cannot be utilized to keep the monitors clean, and it is among the objects of the present invention to provide a simple and effective means for cleaning and maintaining free from dust, lint, fly, etc., the monitor structure of textile mills or the like.

Other objects of my invention are the provision of a monitor cleaning apparatus by which the entire surface of the monitor is subjected to cleaning blasts of air at periodic intervals; the provision of a monitor cleaner which will direct air in an efficient manner to prevent the accumulation of dust in the monitor structure of a building roof; and the provision of an extremely simple and effective means for creating an air cleaning blast which may be directed to all parts of the structure to be kept clean.

The above and other objects of my invention will be seen from the accompanying drawing, in which—

Figure 1 is a diagrammatic plan view through the monitor on the roof of a mill, showing the layout of the monorail track and the blower which travels thereon.

Figure 2 is a vertical cross-sectional view taken substantially on line 2—2 of Figure 1.

Figure 3 is an enlarged side elevation of my self propelling blower unit.

Figure 4 is a fragmentary end view taken substantially on line 4—4 of Figure 3, illustrating the blower fan motor support.

Figure 5 is an enlarged vertical cross-sectional view through the main blower motor and the air stream deflector.

Figure 6 is a detached perspective view of the bracket for mounting the blower unit on the self propelling tractor.

The monitor, which extends upwardly from the main roof 1 of the building, includes vertical side walls 2 and a roof 3. A monorail track 4 is suspended from the roof 3 by suitable hangers 5 and is in the form of an endless loop, the side portions of which are preferably located substantially midway between the longitudinal center line of the monitor and the side walls 2 thereof.

The self propelling blower unit, indicated at B in Figures 1 and 2, includes a main frame 6 having upwardly extending brackets 7 secured thereto. The supporting wheels 8 are mounted on suitable bearings on the brackets 7 and contact members 9 are adapted to engage the current conducting trolley wires 10 which extend parallel to and above the track 4 and may be suitably supported in any suitable manner on the hangers 5. The main driving motor 11 for the blower unit is illustrated as vertically mounted on the frame 6. The lower end of the shaft of the motor 11 extends into a suitable gear box 12 from which a sprocket 13 is driven. The chain 14 extends from the sprocket 13 to an upper sprocket 15 which is adapted to drive a rubber tired drive wheel or roller, preferably mounted on the same shaft as the sprocket 15, but not visible in Figure 3 of the drawing. This drive wheel has frictional engagement with the underside of the track 4 and serves to propel the blower unit around the track 4. A propeller fan 16 may be mounted on the upwardly extending end 17 of the shaft of the motor 11 and will direct a blast of air upwardly against the track 4, trolley wires 10 and the ceiling 3 of the monitor immediately above the track 4.

The frame 6 includes an arm 18 having a vertical flange 19 formed on its end portion. Secured to this flange 19, as by bolts 20, is a blower supporting segment 21. The lower end of this member 21 is curved to fit the fan inlet housing 22 which may be secured thereto by suitable bolts 23 and 24. The inlet housing 22 is annular in form and has an outwardly flared portion 25 and a flat flange 26. Deflector supporting bars 27 are

bolted to the flange 26 at their inner ends. These supporting bars or members 27 are narrow in cross-section and thus provide an open-sided supporting means for the deflector 30 which supporting means do not materially restrict or deflect the flow of air to or from the deflector. At the outer ends of the supporting bars 27 a stiffening ring 28 serves to reinforce and clamp the rim 29 of the air blast deflector 30 to the supporting bars 27. As illustrated, bolts 31 serve to join these members but it will be understood that they may be riveted, welded or otherwise secured in the positions indicated.

A fan motor supporting bracket 32 having a pair of upwardly extending arms 33 and a downwardly extending supporting arm 34 is bolted to the rim of the flared portion 25 of the inlet housing member 22 and the motor 35 is supported on the bracket 32. A propeller fan 36 is secured to the shaft of the motor 35 and is disposed within the fan inlet housing 22. The deflector 30 is preferably made generally conical in shape, as indicated in the drawings, and with its outer periphery adapted to direct the air in a plane substantially at right angles to the axis of the motor 35 and the fan blower 36.

In the operation of my apparatus current from the trolley wires 10 is conducted to the motor 11 and the motor 35 through suitable conductors. The motor 11 will drive the tractor along the track 4 causing it to travel continuously around the monitor at a predetermined rate of travel. During its passage around the monitor the fan 36 will direct a blast of air against the conical deflector 30, the point 30' of which is located on the center line of the fan 36, and this horizontally traveling blast of air will be changed into a radially outwardly moving sheet or disc of air which will extend generally at right angles to the direction of travel of the blower unit B. This vertically extending disc of air will have a whirling movement in addition to its radially outward movement and will effectively reach into all of the corners and surfaces of the monitor structure and remove any dust or lint which may have been deposited thereon, giving it a whirling motion which will maintain it in suspension long enough to permit it to drop downwardly onto the floor where it can be removed. By continuously or periodically operating my blower device the accumulation of lint, etc., in any part of the monitor is effectively prevented. The vertical blast of air from the propeller fan 16 which is mounted on the shaft of the motor 11 may be utilized to augment the cleaning action of the whirling disc air blast provided by the fan 36 and the deflector 30. It will be understood that although the fan 16 may be advantageous in some installations, in others it may not be required.

My self propelling blower unit which directs a whirling disc of air into all parts of the monitor structure is extremely simple and effective, and although I have described the illustrated embodiment of my invention in considerable detail it will be understood by those skilled in the art that modifications and variations may be made in the specific form of apparatus used for carrying out my invention without departing from the spirit thereof. I do not, therefore, wish to be limited to the particular form of my invention herein shown and described, but claim as my invention all embodiments thereof coming within the scope of the appended claims.

I claim:

1. In monitor cleaning apparatus, a track and a blower unit supported by said track, said unit including a propeller fan adapted to discharge a stream of air in a direction generally parallel to the direction of movement of said unit on said track, means for driving said fan, an outwardly flared annular inlet housing disposed around the periphery of said propeller fan, and a generally conical deflector in the path of said stream of air, said deflector being shaped to create a disc shaped stream of air moving substantially at right angles to the direction of movement of said unit on said track.

2. Monitor cleaning apparatus including an endless track disposed within and extending around the monitor and a self propelled blower unit supported by said track, said unit including a frame, a driving wheel carried by said frame and engaging said track, means for driving said wheel, a propeller fan, an annular inlet housing for said fan having an outwardly flaring opening and adapted to direct air into said fan, a generally conical deflector, open-sided means for supporting said deflector with the apex thereof on the center line of said fan and adjacent the center thereof, and means for driving said fan.

3. In monitor cleaner apparatus, a track disposed within said monitor, a blower device supported on said track, means for moving said blower device along said track, said blower device including a propeller fan, means for driving said fan, an inlet housing having an outwardly flared inlet opening, means for supporting said housing with said flared opening disposed around the periphery of said propeller fan, deflector means for directing air discharged by said fan into a rotating, generally disc shaped stream, said stream having its axis of rotation disposed in a substantially horizontal plane, and narrow, non-obstructing bar members extending from the periphery of said flared inlet housing and supporting said deflector means in position relative to said fan.

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