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DEVICE FOR REMOVING DUST FROM AIR

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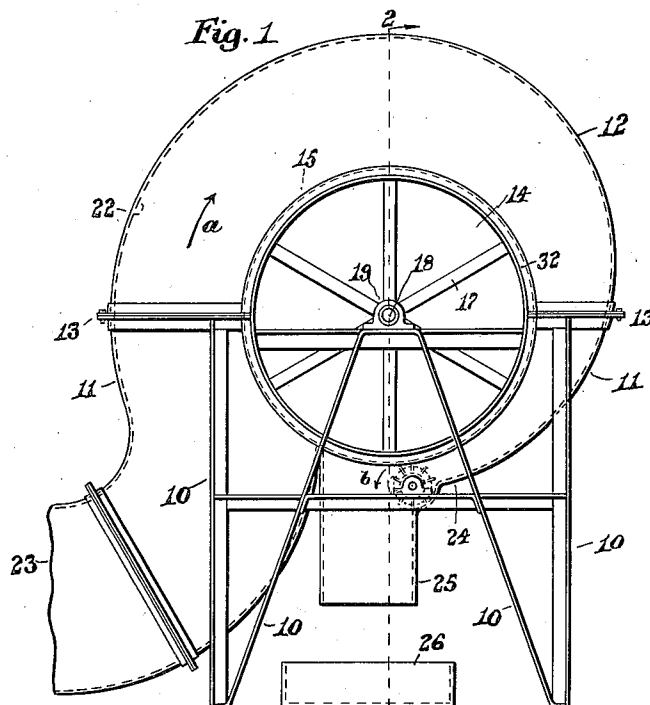


Fig. 2.

Fig. 3.

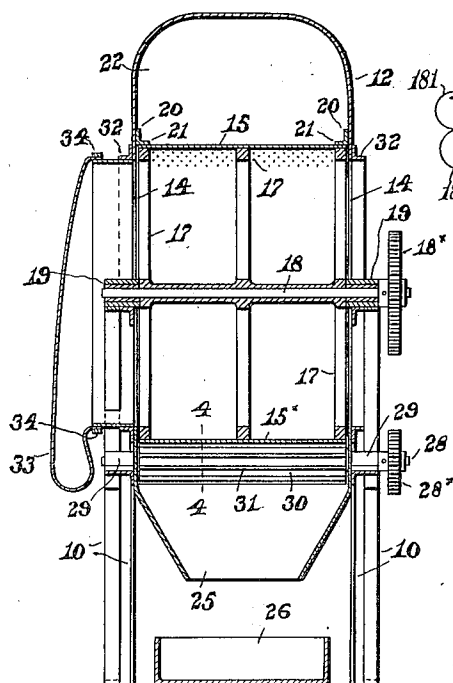


Fig. 5.

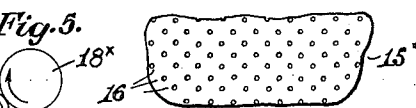
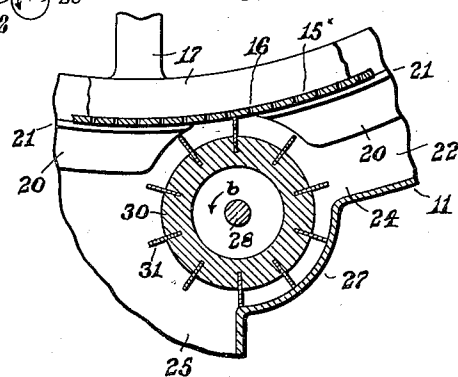


Fig. 4.



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DEVICE FOR REMOVING DUST FROM AIR

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6 Claims. (Cl. 183—63)

This invention relates to devices for removing dust from air which is to circulate throughout a room, thus causing said air to be freed of all fine particles and impurities which might be injurious to the health of workmen in said room.

The object of the invention is to provide an inexpensive apparatus which may be used in connection with machines in a mill which create dust, said apparatus being adapted to receive the dust laden air and separate the dust from the air, permitting the pure air to circulate in the room while the dust and other particles may be collected in piles or receptacles and removed from the room.

This object is attained by the mechanism illustrated in the accompanying drawing.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawing, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawing:

Figure 1 represents an elevation of an apparatus embodying the principles of the present invention.

Figure 2 represents a vertical section on line 2, 2, on Fig. 1.

Figure 3 represents an elevation of a portion of the perforated plate of the rotating drum.

Figure 4 represents an enlarged section of line 4, 4, on Fig. 2, and

Figure 5 represents a diagram of the driving mechanism.

Similar characters indicate like parts throughout the several figures of the drawing.

In the drawing, 10 is a framework supporting the lower part 11 of a casing, the upper part 12 of which is secured to the lower part 11 by means of bolts or screws extending through the flanges 13 on said casing parts.

The casing 11, 12 has openings 14 in the opposite ends thereof.

Within the casing 11, 12 is a cylindrical drum 15, the periphery of which is formed of a metal plate 15x provided with very small perforations 16 extending therethrough.

The metal plate 15x is secured to a plurality of spoked wheels or spiders 17 secured to and rotat-

able with a rotary shaft 18 mounted in bearings 19 on the framework 10.

The drum 15 is open at both ends, said ends being opposite the openings 14 in the casing 11, 12.

Around the openings 14 and secured to the ends of the casing 11, 12 are flexible members 20 of rubber or leather having flanges 21 extending over the periphery of the drum 15 at opposite ends thereof, thus preventing leakage outwardly from the air passage 22 surrounding the drum 15.

This passage 22 is larger at its inlet end 23 into which the dust-laden air is forced from the machines which are connected thereto.

The passage 22 gradually decreases in area 15 from its inlet end 23 to its outlet end 24.

Extending downwardly beneath the drum 15 is a walled passage 25 open at the top and bottom through which dust from the passage 22 may be discharged into a receptacle 26 positioned beneath said passage.

One wall 27 of said walled passage 25 is curved outwardly to connect with the outer wall of said casing 11, and is in the form of a section of a cylinder.

Concentric to this semi-cylindrical wall 27 is a rotatable shaft 28 mounted in bearings 29 on the framework 10.

Secured to and revoluble with the shaft 28 is a cylindrical member 30 having projecting therefrom a plurality of blades 31 of flexible material, the outer ends of which successively contact with the periphery of the drum 15.

The drum 15 rotates in the direction of the arrow a on Fig. 1 and the closure member 30, 31 rotates in the direction of the arrow b.

The shafts 18 and 28 may be rotated by any suitable driving mechanism in any desired time relation to each other and at any desired speed.

In the drawing, gears 18x, 28x are shown as indicating one means for imparting rotation to the shafts 18, 28, the gears having intermediate gears 181, 182, meshing therewith and power being applied to the shaft 18 in any well known manner.

To one of flanges 32 surrounding the openings 14 may be secured a bag 33 of fine woven mesh which will receive any dust which might possibly enter the interior of the drum 14 and pass from that end thereof, all as shown at the left of Fig. 2 of the drawing.

The weave of the bag 33 is such as will permit air to pass therethrough while preventing the passing of fine particles of dust.

The bag 33 may be clamped to the flange 32 by any suitable means, as for instance, the band 34, 55

When a bag 33 is used at one of the openings 14, the other opening 14 would preferably be closed but could be left open if desired, as shown at the right of Fig. 2.

The machines with which this apparatus is connected are usually provided with a blower to remove the dust from the machines and the outlets from these blowers are connected to the inlets 23 of the apparatus herein shown and described.

As the passage 22 gradually decreases from its inlet end 23 to its outlet end 24, the volume of dust-laden air entering the passage 22 is restricted in its passage and must find some way to escape which it does by passing through the perforations 16 into the interior of the drum 15 where it may escape into the room free from dust and other particles.

The outlet end 24 of passage 22 is normally closed by the member 30, 31 but when this member 30, 31 is rotated a restricted amount of dust will be permitted to pass into the dust outlet passage 25.

Some of the air entering the drum 15 will pass outwardly through perforations 16 in the plate 15x and force downwardly the dust in passage 25 into the receptacle 26 in which it may be removed and disposed of in any suitable manner.

As the dust-laden air endeavors to enter the drum 15 through the perforations 16, the dust is liable to collect and form a film on the periphery of the drum 15 and this film will further assist in removing the dust from the air permeating the film.

As the drum 15 rotates in direction of arrow a the film on the periphery thereof will be removed therefrom at the outlet end 24 of passage 22 by the blades 31 of member 30 and will be permitted to enter the dust outlet 25.

In many mills the air circulating in a room is filled with dust which gets into the eyes, ears and nostrils of the workmen interfering with their work and sometimes causing serious injury to them.

By means of the present invention all these objections are overcome and air circulating

throughout the room is constantly kept free of all impurities.

Should any very fine dust succeed in passing into the interior of the drum 15 it will be collected in the bags 33.

The apparatus is of simple construction, inexpensive to make and operate, and has many advantages which it is believed will be thoroughly understood without further description.

Having thus described my invention, I claim

1. In an apparatus for removing dust from air, the combination of an open ended drum provided with small perforations in the periphery thereof; means for rotating said drum; a walled dust outlet extending downwardly beneath said drum and open at the top; a casing for said drum provided with openings in its ends opposite the ends of said drum and having a closed air passage surrounding said drum with an air inlet at one end and communicating at the other end with said dust outlet and a rotary closure located between said outlet dust and said air passage.

2. An apparatus as set forth in claim 1, in which said closure consists of a rotary bladed member.

3. An apparatus as set forth in claim 1, in which said closure consists of a rotary bladed member which is positioned at the entrance to said dust outlet from said air passage, the outer ends of the blades of which are adapted to successively contact with the periphery of said drum during the rotation of said member.

4. An apparatus as set forth in claim 1, in which said closed passage from its inlet end gradually decreases in size and said rotary closure is located at its smaller end.

5. An apparatus as set forth in claim 1, in which packing members are secured to the interior wall of said casing with flanges extending over the periphery of said drum at opposite ends.

6. An apparatus as set forth in claim 1, in which a fine meshed bag is secured over one of the openings in said casing opposite the ends of said drums.

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