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PROTECTOR FOR INLETS OF AIR BLAST GENERATORS

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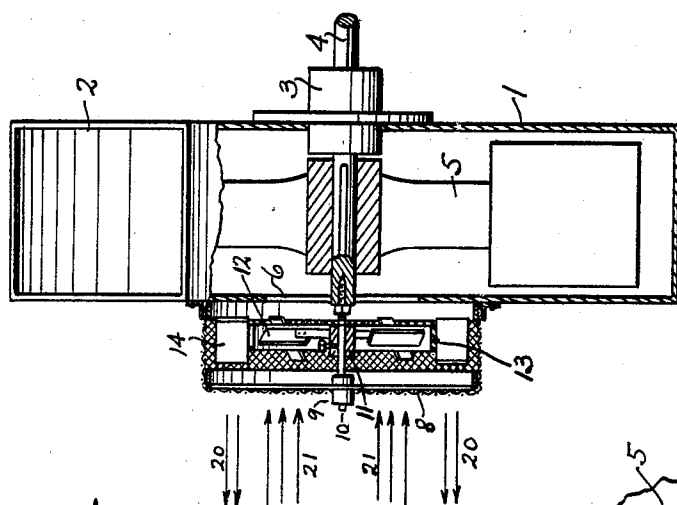


Fig. 2.

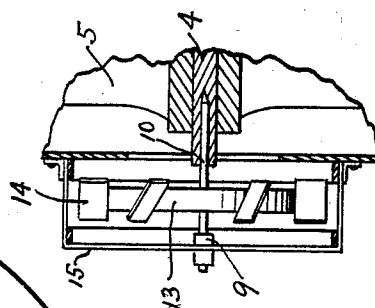


Fig. 3.

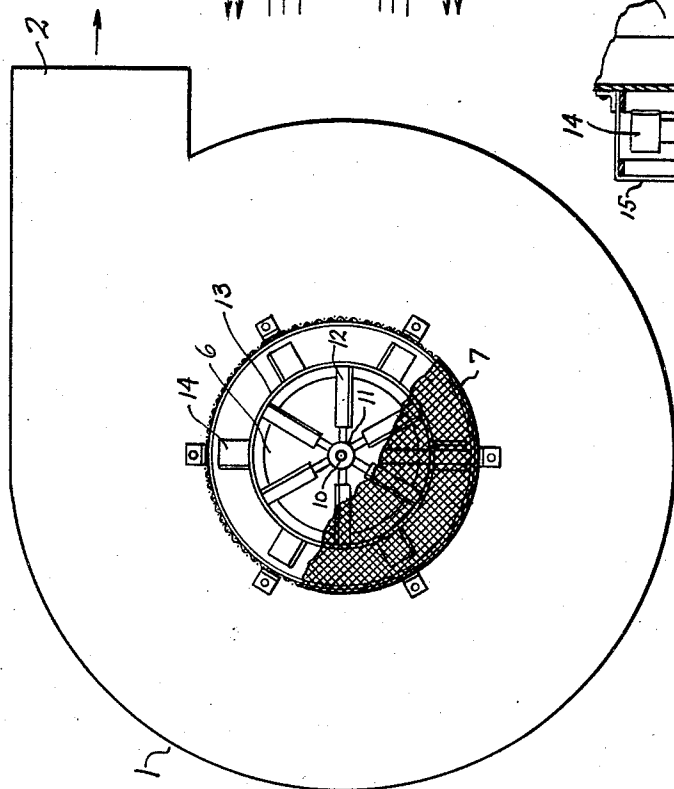


Fig. 1.

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PROTECTOR FOR INLETS OF AIR-BLAST GENERATORS

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This invention relates to new and useful improvements in means for preventing dust, lint and other foreign particles from entering the inlet of an air blast fan.

5 One object of the invention is to provide means of the character described specially applicable to cotton gin machinery and particularly designed to prevent dust, dirt and lint from entering the air line which carries
10 the ginned cotton to the condenser, to the end that said dust, dirt and lint will not enter the air line and be mingled with the cotton therein and lower the grade thereof. The improved means is also adapted to be
15 used in connection with the current generating fan which generates the current through the air pipes which terminate in the blast nozzles adjacent the gin saws, said nozzles being provided for the well known purpose,
20 the device herein described, excluding the dirt, lint and other foreign matter from the air which is not so excluded would clog up said nozzles.

25 Another object of the invention is to provide a device of the character described which is of very simple construction, which may be cheaply and easily produced, and which is very efficient in use.

30 With the above and other objects in view this invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings,
35 wherein:

Figure 1 shows a side view of an air blast fan embodying my invention;

Figure 2 shows a front elevation, partly in section of Figure 1;

40 Figure 3 shows a view partly in section of another modification of the invention.

Referring now to the drawings, wherein like numerals of reference designate similar parts in each of the figures and in particular
45 to Figures 1 and 2, the numeral 1 designates the casing, or housing of an air blast fan having the discharge outlet 2 through which the air blast may be driven into and through the lint flue (not shown) and provided in
50 a cotton gin to convey the ginned cotton to the

condenser. Air passing from the outlet 2 may, if desired, be conducted to the blast nozzles of the gin saws by any suitable means, as will be understood by the person skilled in the art.

55 One end of the housing 1 has a long bearing 3, secured thereto in which the fan drive shaft 4 rotates. Fixed on this shaft, within the fan housing, there is a blast fan 5. The shaft 4 is driven by any suitable means in a
60 direction to generate an air blast out through the outlet 2 as indicated by the arrow in Figure 2.

The other end of the housing has an air inlet 6, and secured to said end and surrounding and enclosing said inlet there is the
65 cylindrical foraminated screen 7. The outer end 8, of this screen has a central bearing 9 and there is an extension shaft 10 whose inner end is either attached to the shaft 4, as
70 shown in Fig. 2, or runs in a bearing in the adjacent end of the shaft 4, as shown in Figure 3. The outer end of shaft 10 runs in the bearing 9. Fixed on the shaft 10 is a fan or
75 rotor consisting of the central hub 11, the radial blades 12 secured to said hub, the annular rim 13 secured to the outer ends of the blades, and the peripheral fins or blades 14
80 secured to and spaced apart around said rim.

The blades 12 are similarly inclined to
80 their common plane so that the current of air drawn inwardly through inlet 6 by the fan 5 will strike against said blades 12 and rotate them in the modification shown in Figure
85 3. In the modification shown in Figure 2 the blades 12 will be rotated positively from the shaft 4, as the shaft 10 is connected with the shaft 4. The wide fins or blades 14 revolve with the blades 12. These fins or im-
90 peller blades 14 are similarly inclined in a direction opposite to that of the blades 12 so that the fins or blades 14 as they revolve will generate currents of air outwardly from the fan housing around the inlet 6 in a direction
95 parallel with their axis of rotation, as indicated by the arrows 20 in Figure 2.

The dust, dirt and lint in the air in the room where the device is located is given off from the gin machinery handling the cotton, and the space or zone around the outside of

the inlet 6 of the blast fan is shielded or protected by the outwardly moving air currents around it, so that said foreign matter in the air given off by the gin machinery is prevented from entering the stream of air, indicated by the arrows 21, entering the inlet 6. Any particles of dust, dirt or lint reaching said outwardly moving current of air is carried off beyond the range of the inwardly moving current. The air in the protected or shielded zone immediately in front of the inlet 6 and blades 12 is therefore comparatively free from lint, dust and dirt, and consequently the screen will not be clogged up by the lint collecting on the outer side thereof and the nozzles hereinabove referred to will not be liable to be clogged by foreign matter in the air, nor dust, dirt or lint carried into the air line of the condenser. It will be noted that the air entering the inlet 6 is drawn therein in such a manner that it is moved inwardly in a confined stream, the confining influence being an outwardly moving stream of air which prevents the movement of dust and lint, laden air into the incoming stream from portions of the atmosphere surrounding the outgoing stream of air in close proximity to the fan housing 2 and inlet 6 thereof. It will be seen, therefore, that there is a zone produced in front of the inlet 6, and in front of the screen 7 when it is employed, into which floating dust, dirt and lint particles are substantially excluded, and these floating particles instead of entering the incoming stream of air entering the inlet 6 settle in the room at a point removed from the fan housing and inlet 6. Under these conditions the air entering the inlet 6 is derived from a point considerably removed from said inlet, at which point the concentration of dust, dirt and lint is not as great as near the fan housing and at which point the floating dust, dirt and lint particles have been largely removed by their own sedimentation in the quieter air of the room removed from the fan housing.

In the modification shown in Figure 3, the protecting screen 7 is omitted, and the outer central bearing 9 supported by a frame 15. In this modification, the air entering the inlet 6 of the fan casing will cause the blades 12 and 14 to be rotated, producing the two oppositely directed air currents previously described, and the shaft 10 to be pushed inwardly into its bearing in the shaft 4 and against the end of said bearing, whereby the shaft 10 will receive also rotary motion from the shaft 4. When the portion of the shaft 10 fitting within the bearing in the shaft 4 is made long and the weight of the blades 12 and 14 and rim 13 is not too great, the outer central bearing 9 in both modifications may be omitted.

While I have shown what I now consider to be preferred forms of the invention, it is

clear that mechanical changes may be made therein and equivalents substituted for the parts shown, and I hereby reserve the right to make such mechanical changes and substitutions as may be found desirable and such as may be comprehended within the scope of the appended claims.

The present application is a continuation in part of my copending application Ser. No. 250,436, filed January 30, 1928.

What I claim is:

1. The combination with a housing having an inlet opening and a discharge outlet, an air current generator in the housing effective to create a current inwardly through said opening and out through said outlet, a hood-like screen fastened to the out-side of the housing and surrounding said opening, a fan within said screen including radial blades correspondingly inclined, in one direction, to their common plane, and peripheral fins correspondingly inclined in the other direction.

2. The combination with a housing having an inlet and an outlet, an air current generator in said housing effective to create a current inwardly through said inlet, and means associated with said inlet effective to create an air current counter to and around said inwardly moving current for forming a lateral air shield for said inwardly moving current for preventing dust, dirt, or lint from entering the inwardly moving current.

3. The combination with an air current generator effective to create an air current toward said generator, of means associated with said generator effective to create an air current counter to the current created by said generator for forming a lateral air shield for the said air current moving towards said generator for preventing dust, dirt or lint from entering the air current moving to the generator.

4. The combination with an air current generator effective to create an air current toward said generator, of means associated with said generator effective to create an air current counter to and around the current created by said generator for forming a lateral air shield for the said air current moving towards said generator for preventing dust, dirt or lint from entering the air current moving to the generator.

5. The combination with a housing having an inlet and an outlet, an air current generator in said housing effective to create a current inwardly towards said inlet, a rotor positioned before said inlet having radial blades adapted to be rotated, and blades on said rotor disposed about and extending radially beyond said radial blades adapted to produce a current outwardly around said inlet for forming a lateral air shield for said inwardly moving current for preventing dust, dirt or lint from entering said inwardly moving current.

6. The combination with an inlet of an air
current generator effective to create an air
current inwardly through said inlet, a rotor
positioned for rotation before the said inlet,
5 said rotor comprising a plurality of inclined
radially disposed blades, and a plurality of
rotatable blades disposed about and extending
radially beyond said radially disposed blades
and inclined oppositely to said radially dis-
10 posed blades to produce an outwardly moving
current forming a lateral air shield for said
inwardly moving current for preventing dust,
dirt or lint from entering the inwardly mov-
ing current.

15 In testimony whereof I affix my signature.
FRANK F. BALUSEK.

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