

March 13, 1951

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2,544,813

BLOWER

Filed Dec. 9, 1947

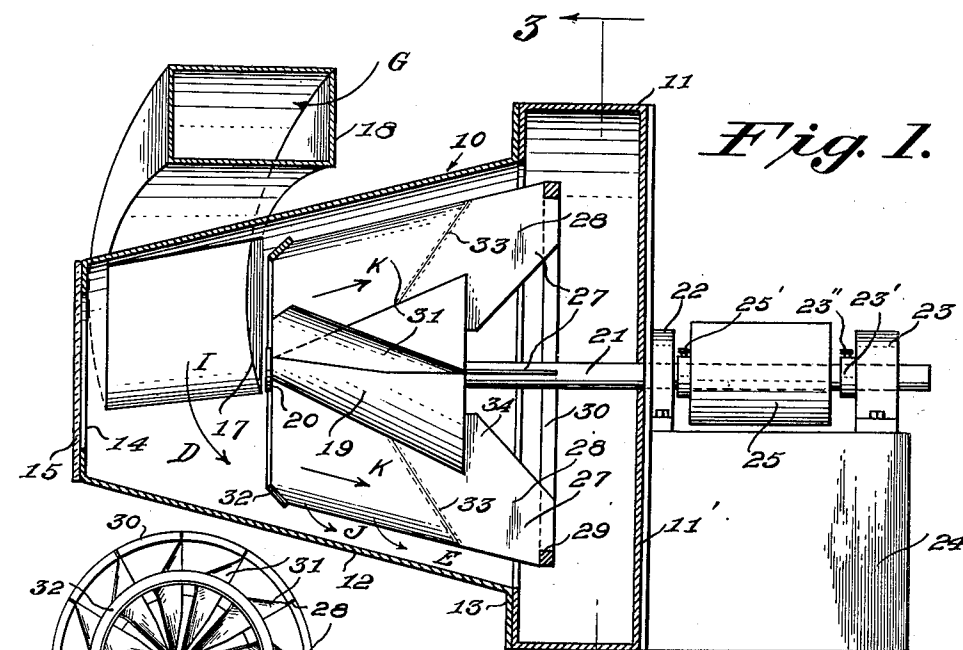


Fig. 1.

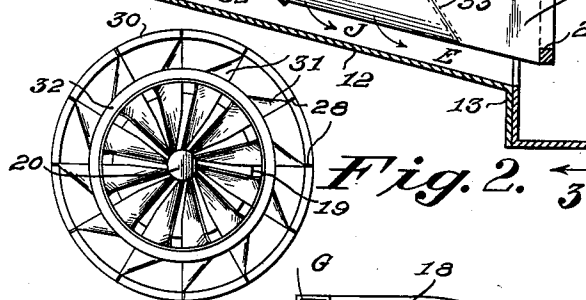


Fig. 2.

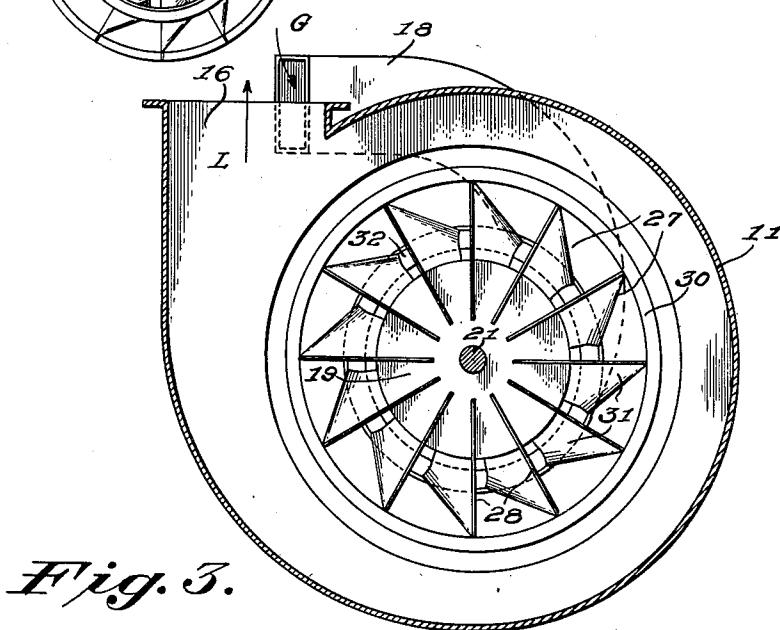


Fig. 3.

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2,544,813

BLOWER

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Application December 9, 1947, Serial No. 790,685

5 Claims. (Cl. 230-119)

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This invention relates to a blower.

The invention is more particularly concerned with a blower for use in conveying materials such as chips, sawdust, cotton seed, beans, peas, etc., from one location to another, the blower being adapted for connection in a conduit line through which such materials are to be conveyed or transported.

The improved blower according to the present invention is not, however, limited in use for the conveying or transporting of materials, but is adapted for use in any instance where maximum suction and air blast pressure with a given amount of power is required or desired.

A primary object of the invention is the provision of a blower including a casing having inlet and outlet openings and a fan rotatably disposed within the casing, and wherein the casing and fan are so constructed and interrelated as to provide a maximum air effort for a given amount of fan-driving power.

A further object of the invention is the provision of a blower including a casing of frusto-conical form having an inlet opening adjacent its smaller end and an exit disposed within the casing having blades whose outer edges are substantially parallel with and spaced from the inner wall of the casing, and said blades being formed to provide maximum suction adjacent the inlet opening.

A further and more general object of the invention is to improve structures of this kind for more effective use, particularly in the transporting of materials as above referred to.

Other objects and advantages of the invention will become apparent in the course of the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a view partly in longitudinal vertical section and partly in elevation and showing only a portion of the fan blades for better understanding of the forms thereof.

Figure 2 is an end elevation of the fan as seen from the smaller end thereof.

Figure 3 is a transverse sectional view in the plane of line 3-3 on Figure 1.

Referring now in detail to the drawing, 10 designates a casing or housing which includes a cylindrical header 11 and a frusto-conical member 12 having its larger end communicating with the header and which includes a flange 13 suitably but preferably removably secured to the header. The smaller end of member 12 is provided with an opening 14 for access to the interior for inspection or cleaning, and such opening is

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normally closed by a cover plate 15, which is preferably of plate glass, whereby the operation within the blower can be readily visualized.

The header 11 is provided with an exit or discharge opening 16 and the member 12 adjacent its smaller end is provided with an inlet opening 17 from which extends a conduit 18 which is disposed at an angle to the axis of member 12, as indicated. The improved fan is disposed within member 12 and extends from adjacent opening 17 to partially within the header 11, and such fan includes a conical hub 19 having a circular flange 20 at its vertex, and a shaft 21 extends from the base end of the hub, through the header 11 and bearings 22 and 23 supported on a bracket 24 suitably secured to the vertical closed wall 11' of the header, and a drive pulley 25 is fixed to shaft 21 intermediate the bearings 22 and 23.

The fan further includes a plurality of blades 27, only three of which are shown in Fig. 1, but all of which are shown in Figs. 2 and 3.

Each blade 27 includes a plane portion 28 which is disposed in a plane of the axis of shaft 21 and which extends radially of the base of hub 19. Each such portion is cut out as at 29 and such cut outs jointly receive a ring 30 which is suitably welded to the blades.

The remaining portion of each blade 27 extends at a substantial angle to portion 28 in the direction of rotation of the fan and such portion is also inclined with respect to the radii of the hub, as is indicated at 31, the top edges of portions 31 being curved in the direction of rotation of the fan. The deflected blade portions 31 are angled at their exposed corners for reception of a ring 32 which is welded to all of the blades.

The intersections between the fan blade portions 28 and 31 are on the bend lines 33 which extend diagonally toward the vertex of the hub 19. The bottom edges of blade portions 31, together with corresponding bottom edges of portions 28 rest on the surface of hub 19, and the portions 28 include extensions 34 which abut the base end of hub 19, and the opposite ends of the blades set back of flange 20. The blades are suitably welded to the conical and base surfaces of the hub.

With the fan blades formed and disposed on the hub as disclosed, the portions 31 act to draw air into the inlet opening 17 by creation of large vacuum at this point and the blade portions 28 force the air in a direction parallel with planes normal to shaft 21. The blades 27 preferably extend into the header 11 as indicated and their position therein may be readily adjusted by axially

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shifting the shaft 21 through the inner race 23' of bearing 23 upon releasing screw 23''. The pulley 25 may be provided with a screw 25' for adjustment corresponding with any axial shifting of the shaft.

In operation of the improved blower as above described, air and materials enter conduit 18 in the direction of arrow G and the materials are drawn into chamber D through the opening 17 in the wall of member 12, and such materials enter the chamber D in the direction of arrow I. The materials upon entering chamber D are directed toward the wall of member 12, and the materials are thence directed through space E between the wall of member 12 and the outer edges of the fan blades 27. The major volume of air is directed by the fan in the direction of arrows K but, due to centrifugal action, the materials are constrained to move within space E toward header 11 and are thereby kept out of the blades of the fan. This not only requires less power to operate the fan but also avoids damage to the fan as well as possible comminuting of the materials.

The materials upon entering header 11 mix back into the major volume of the air and are discharged through the outlet 16.

From the above disclosure, it will be appreciated that the improved blower possesses the maximum requirements for the transporting of materials which are directed out of range of the fan, and which fan is of an improved construction whereby a maximum volume of air is drawn through the blower housing with the expenditure of a minimum amount of power.

While I have disclosed my invention in accordance with a single specific embodiment thereof, such is to be considered as illustrative only, and not restrictive, the scope of the invention being defined in the following claims.

What I claim and desire to secure by U. S. Letters Patent is:

1. A blower comprising a housing including a cylindrical header having a closed end wall, a frusto-conical casing member having its larger end communicating with said header through the other end wall thereof, the smaller end of said casing member having an opening, a transparent cover over said opening, a fan rotatably supported within said housing and including a plurality of blades elongated in the direction of the axis of said casing member, the outer edges of said blades being parallel with and in spaced relation to the wall of the casing member, an inlet opening in the wall of said casing member between said cover and said fan, and an outlet opening in the cylindrical wall of said header.

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2. A blower according to claim 1, wherein said fan blades have inner edges secured to a conical hub, and said blades each including a portion adjacent said header in a plane of said axis and a portion adjacent said inlet opening inclined to said plane in the direction of rotation of the fan.

3. A blower comprising a housing including an elongated frusto-conical casing member, a fan supported within said casing member, said fan including a conical hub coaxial with said casing member, and a plurality of blades supported by said hub, said blades each including a plane portion of substantial area adjacent the base of the conical hub and extending axially beyond said base and radially inwardly thereof, said portion being in a plane of the axis of the hub, each blade including another substantially plane portion inclined to said plane in the direction of rotation of the fan, and the outer edges of both portions of the plurality of blades being in substantially uniform spaced relation to the inner wall of said frusto-conical casing member.

4. The structure according to claim 3, wherein the second-named portions of the blades terminate in a plane perpendicular to the axis of said hub and extending through the vertex thereof, the outer edges of the second-named blade portions being curved in the direction of rotation of the fan, and a ring connecting the ends of said second-named portions adjacent the curved edges thereof.

5. The structure according to claim 3, together with a ring connecting the outer edges of the first-named portions of the blades adjacent the ends thereof.

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