Jan. 20, 1948. B. J. PAULSON 2,434,745

BLOWER

Filed May 8, 1945 2 Sheets-Sheet 1

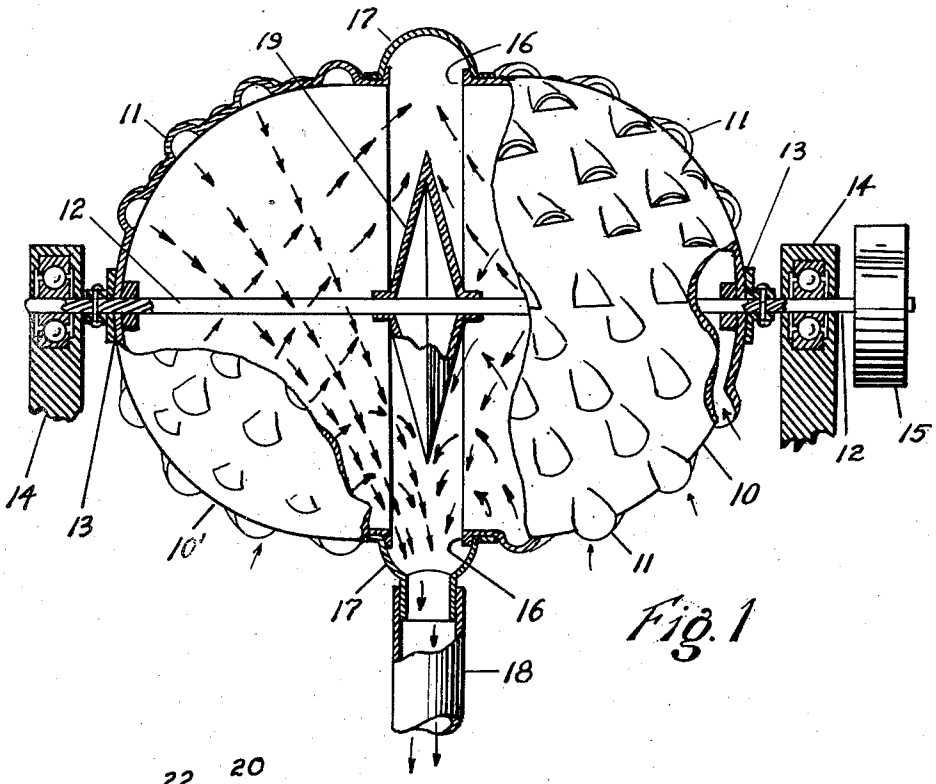


Fig. 1

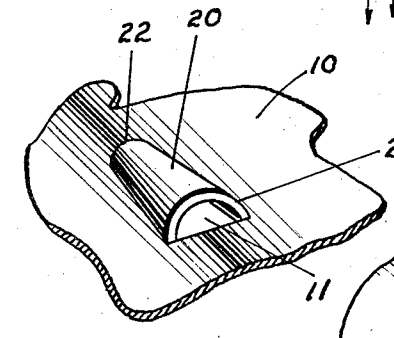


Fig. 2

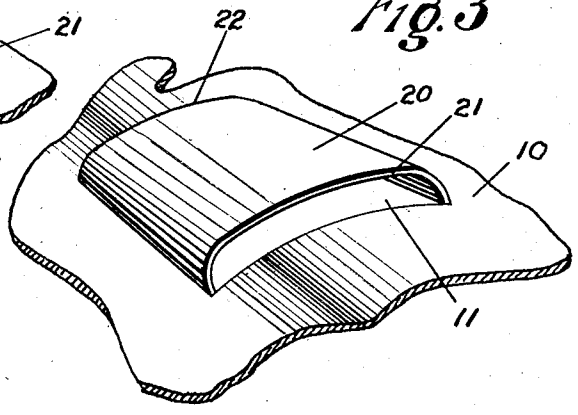


Fig. 3

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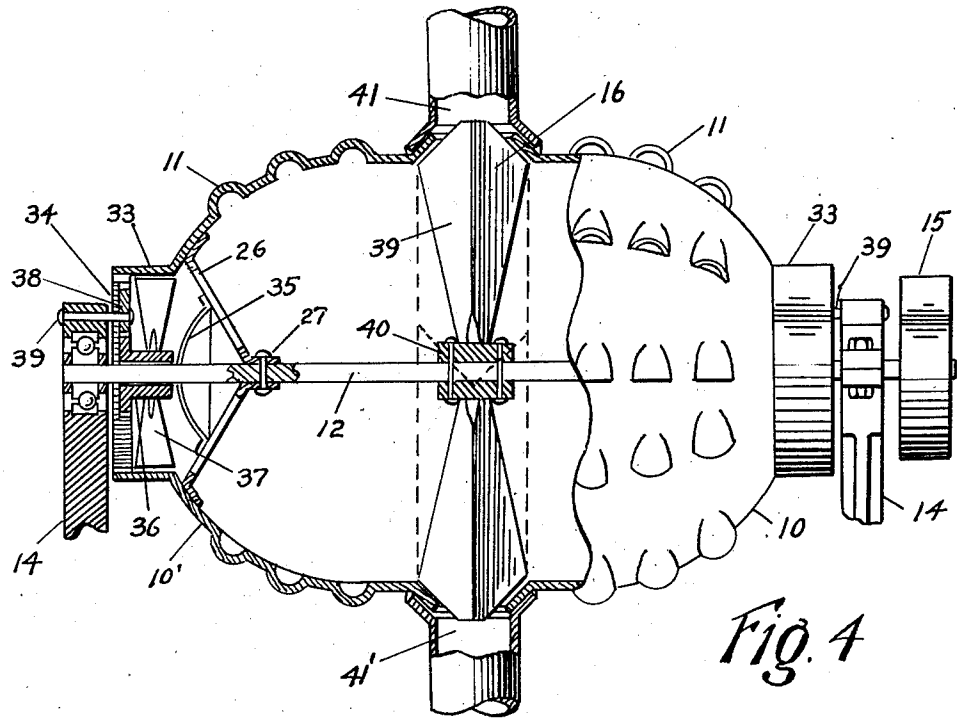


Fig. 4

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UNITED STATES PATENT OFFICE

2,434,745

BLOWER

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Application May 8, 1945, Serial No. 592,680

8 Claims. (CL 230—124)

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My invention relates to blowers and more particularly to a type of blower that may be used for conveying air, vapor, liquids or the like.

The object of my invention is to provide a revolving blower blade consisting of a hollow shell provided with ports in the form of outwardly extending louvers embossed on its circumferential peripheral surface, which blade, when revolved, produces a radially controlled and accelerated stream of air, centralized at a definite point, caused by the variation in the velocity of the air entering at the various ports due to the shape of the blower blade, the louvers on the peripheral surface providing a continuous, centripetal deflection of air and producing a high volumetric internal current within the shell.

An object of my invention is to provide greatly increased volumetric efficiency, as compared with blowers of more conventional design, by combining length with diameter, thus securing an all directional intake of air and securing a greater range of volumetric flexibility and control.

A still further object of my invention is to provide a device of the character described that is equipped with a centrally disposed propeller fan, employed to circulate and exhaust the air taken into the enclosure by means of the louvers embossed on the outer periphery of the revolving cone.

Another object of my invention is to provide means on the open end of the conical structure, in the form of propeller fans rotating at a speed greater than the cone, for impelling additional air to mix with the centripetally induced flow of air in the case of the convex cone structure, or expelling the flow of air centripetally induced into a concave core structure by the louvers on the outer periphery of the revolving cone.

The device, as illustrated, described and claimed, will produce a supercharging effect causing a dense cushion of air of high velocity, due to the shape of the blower blade and the position of the outwardly extending louvers disposed on the circumferential periphery of the blade, thereby affecting a high propulsion and volumetric efficiency. The device may be employed as a blower, a mixer, or a homogenizing machine depending on the type of element being employed, whether it be air, vapor or liquid.

Other and further objects of my invention will become more apparent as the description proceeds when taken in conjunction with the drawing, in which,

Figure 1 is a fragmentary, cross sectional view of a convex type of blower blade and its

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mountings, showing the plurality of louvers projecting outward from its peripheral surface.

Figure 2 is a fragmentary, perspective view of a port or louver showing its construction with a semi-circular cutting edge at its open end.

Figure 3 is a similar view as shown in Figure 2, but showing the louvers of an elongated construction.

Figure 4 is a fragmentary cross sectional view of a convex type of blower blade and its mounting, similar to that shown in Figure 1, but provided with a centrally disposed exhaust fan in the form of a propeller, and a pair of propeller fans, one on each end of the device for impelling a flow of air to mix with the air induced by the louvers projecting outward from its peripheral surface.

Similar characters of reference indicate corresponding parts throughout the several views and referring now to the same, the characters 10 and 10', in Figure 1, show hollow shells or conical blower blades having a plurality of ports or louvers 11 embossed outwardly on their peripheral surface. These louvers are shown in staggered relation to one another, and are also shown arranged in a circular path on the periphery of the blades. The contour of the cones 10 and 10' permit alignment of the louvers in a manner whereby the number of louvers 11 near the end portion supporting the cones are less than the number of louvers near the center of the blade assembly. Obviously, in the rotation of the cones the louvers near the ends will scoop less air than the louvers near the center, due to the variation in the speed of their travel. The louvers at the large circumference travel faster than those near the end where the circumference is smaller.

The conical shells 10 and 10' are attached to a shaft 12 at 13 by means of collars, and the shaft 12 is shown supported by bearings 14 which may be of any conventional design. The shaft 12 may be rotated by an actuating means, not shown, connected by a belt to a pulley 15 as shown, or in any other convenient manner. The open ends of the cones 10 and 10' are shown provided with outwardly extending flanges 16 around their entire periphery. These flanges 16 engage an annular semi-circular duct encircling the entire unit and terminating into an outlet tube 18. Centrally disposed on the shaft 12 and in direct alignment with the duct 17, in Figure 1, is an annular conical shaped baffle 19 attached to the shaft 12 and extending outward therefrom. The baffle 19 is employed to deflect the air or the like scooped by the louvers 11 and which follows the path indicated by the arrows into the duct 17 from which

it is forced outward through the tubular member 18. The air being scooped by the louvers 11 entering the cones is directed toward the center of the blade assembly and builds up a pressure which is deflected by the baffle 19 into the duct 17.

The shape of the louvers 11 may be either semi-radial, as shown in Figure 2, or elongated, as shown in Figure 3. In every instance, the canopy 20 tapers from the opening formed by the cutting edge 21 downward to a point 22. This canopy may be either straight or angularly disposed in relation to the opening 11 formed by the edge 21.

In Figure 6 is shown a convex type of assembly similar to the one shown in Figure 1, but having the outer ends 33 of the convex cones 10 and 10' open and provided with an internal gear 34. The conical blades 10 and 10' are supported by the shaft 12, by means of arms 26 attached to the shaft 12 at 27. Attached to these arms is semi-radial baffle 35 rotating with the cones 10 and 10'.

At the ends of the shaft 12 is a spur gear 36 on which is mounted a propeller fan 37. This gear is rotatably mounted on the shaft 12 and not attached thereto. An intermittent auxiliary spur gear 38 is rotatably mounted onto a shaft 39 supported by the bearings 14 at each end. These gears 38 engage the internal gear 34 and the spur gears 36. As the internal gears 34 are rotated with the cones 10 and 10' supported on the shaft 12, the auxiliary gears 38 will revolve due to their engagement with the internal gear 34, and will cause the spur gears 36 supporting the propeller fans 37, to revolve at a higher speed, thus the propeller fans 37 will be caused to speed up and impel outside air into the enclosure formed by the cones 10 and 10'. This air will be deflected by the baffle 35 in its travel.

In the center of the structure is shown a propeller fan 39 mounted to the shaft 12 at 40 and revolving thereunto. The fan 39 has its blades angularly disposed to scoop the air within the enclosure formed by the cones 10 and 10' outward through the tubular members 41 and 41'. Obviously, as many of these tubes 41 and 41' may be employed as deemed necessary or convenient to convey the air within the enclosure to the various points of use.

It is manifest to anyone familiar with the art that the type of blower arrangement described may be employed to provide pressure as well as suction depending on the shape of the blade, and although I have shown a specific type of construction to portray the arrangement of the various parts performing the functions outlined, I fully realize that many changes may be made in the configuration of the various parts, and I reserve the right to make such changes as may suggest themselves in the construction of the device without departing in any way from the spirit of my invention or the scope of the appendant claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent in the United States is:

1. A blower of the character described comprising a spherical blower fan provided with outwardly extending louvers embossed on its peripheral surface, an enclosure provided with openings therein, said enclosures encircling said fan at its central peripheral surface and adapted to receive the air scooped by said louvers, and means for revolving said blower fan within said enclosure.

2. A device of the character described comprising a blower blade, said blade consisting of a pair

of semi-spherical hollow shells having their open ends toward one another, a plurality of outwardly embossed louvers on the peripheral surface of said shells, said shells mounted on a shaft extending therethrough, an annular enclosure surrounding the open portion of said shells, said enclosure adapted to receive the air scooped by said louvers and acting as a pressure chamber for said air, in combination with means for revolving said shells within said enclosure.

3. A device as described in claim 2, in which the louvers are open at their face and taper toward the surface of said shell.

4. A blower of the character described comprising in combination a pair of semi-spherical blower blades, said blades of hollow construction provided with a plurality of outwardly embossed louvers on their peripheral surface, a shaft disposed longitudinally through said blades for supporting said blades bearing on the ends of said shaft for its support, means for causing said shaft to be rotated, and an enclosure provided with openings and adapted to encircle and receive the open ends of said blower blade.

5. A blower of the character described comprising a spherical blower fan provided with outwardly extending louvers embossed on its peripheral surface, an enclosure provided with openings therein, said enclosure encasing said fan at its central portion and adapted to receive the air scooped by said louvers, means for revolving said blower fan within said enclosure, a centrifugal discharge fan mounted to said shaft at a central point in direct alignment with the openings within said enclosure.

6. A device as described in claim 5, in which the spherical blower fan consists of two semi-spherical cones closed at their outer ends and spaced apart on a shaft and having the centrally disposed centrifugal discharge fan provided with angularly disposed blades to draw the air from the opposite sides of said cylindrical blower fan.

7. A blower of the character described comprising in combination, a spherical blower blade, said blade consisting of two sections of semi-spherical construction spaced apart at their open ends provided with a plurality of outwardly embossed louvers on its peripheral surface, a shaft disposed longitudinally through said blower blade sections for supporting said sections, bearings on the ends of said shaft for its support, an enclosure provided with openings and adapted to receive the open ends of said blower blade, a propeller fan having blades of angular contour mounted to said shaft at a point in direct alignment with the openings within said enclosure, said sections of the semi-spherical blower blade open at their outward ends, internal gears disposed within said openings, spur gears rotatably mounted on said shaft in direct alignment with said internal gears, auxiliary gears engaging said spur gears and internal gears, said auxiliary gears rotatably mounted on auxiliary shafts supported by said bearings, propeller fans provided with a plurality of blades mounted to said spur gears and caused to rotate with said spur gears, outwardly extending members attached to said main shaft for supporting said sections of the cylindrical blower fans, and means for revolving said main shaft thereby causing the propeller fans within the open ends of said blower blade sections to revolve at a higher speed than said blower blades.

8. A device as described in claim 7 provided with a centrally disposed centrifugal discharge

fan for exhausting the air within the cylindrical blower fan through the openings of said enclosure.

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