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IMPELLER FOR A CENTRIFUGAL FAN OR BLOWER

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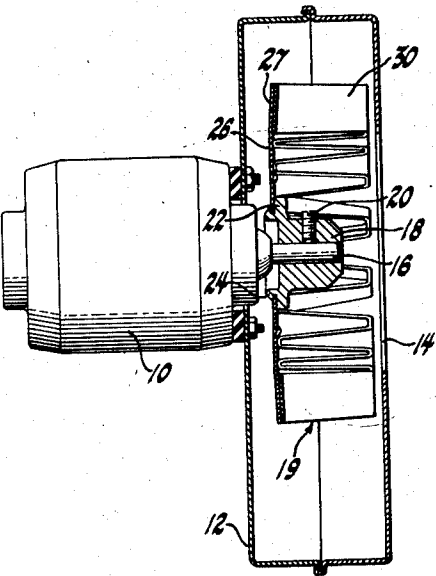


Fig. 1

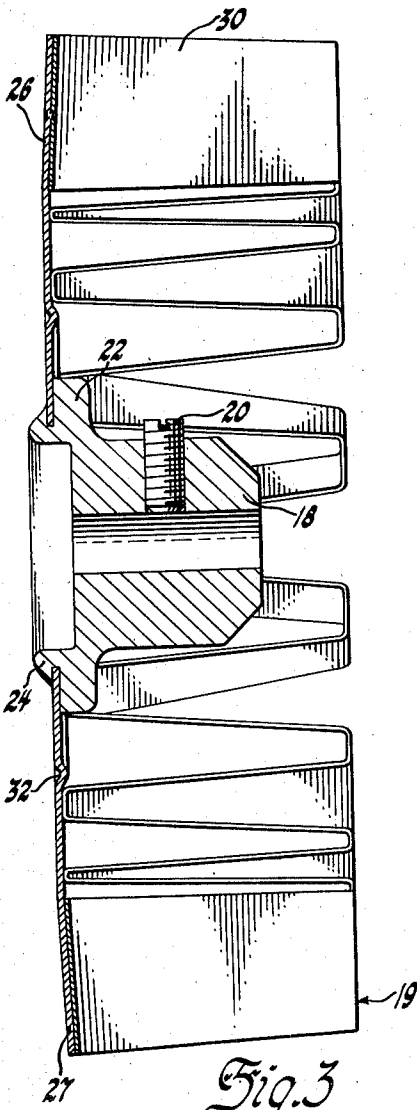


Fig. 3

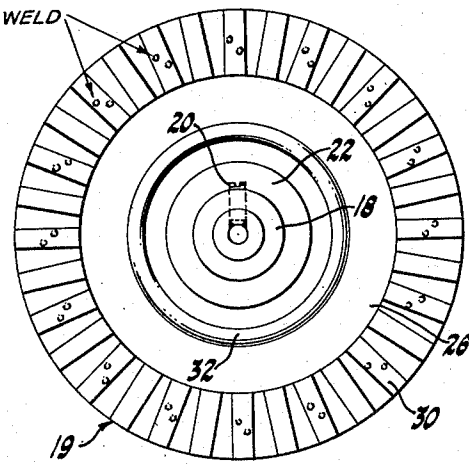


Fig. 2

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IMPELLER FOR A CENTRIFUGAL FAN OR BLOWER

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1 Claim. (Cl. 230—134)

This invention relates to impellers or rotors for use in centrifugal fans or blowers for fluids, such as blowers used to drive or circulate air for heating or cooling or other purposes.

It will be appreciated that the impeller of this invention, although developed for circulating fluids such as air in automotive vehicles, it may be employed in many other fields and may be utilized in pumps.

In various forms of heating, ventilating, and defrosting systems, as employed in motor vehicles, it is advantageous that a fluid such as air be circulated by a simple apparatus in an efficient and effective manner. In blowers heretofore employed for such purposes it has been found desirable to retain a simplified form of construction for the impeller and at the same time to reduce the cost of manufacture without adversely affecting the performance characteristics.

It is an object of this invention to provide an improved impeller for a blower or centrifugal fan which is inherently well balanced, efficient in operation and may be manufactured at low cost.

It is an important feature of the invention that a sinuous strip in annular form and having spaced undulations be affixed to one side of a disc with the strip and disc being coaxially mounted upon a hub. Another feature is a dished construction of the disc in a dynamically well balanced unitary arrangement with the sinuous strip fully supported on the disc.

The above and other features of the invention will now be more particularly described by reference to the accompanying drawings and pointed out in the claim.

In the drawings,

Figure 1 is a view, partly in section of a centrifugal fan or blower assembly in which the present invention is embodied;

Figure 2 is a view in the axial direction of the impeller shown in Figure 1 and drawn to a larger scale; and

Figure 3 is an enlarged sectional view of the impeller shown in Figures 1 and 2.

In Figure 1 is depicted a motor 10 to which is conventionally attached a centrifugal fan or blower casing 12 having an inlet 14. The casing 12, of course, has a periphery fluid outlet although this outlet is not shown in the drawings.

The motor 10 is provided with a power shaft 16 which extends within the casing 12 and to which is attached a hub 18 of a fan or blower 19 by means of a set screw 20.

The hub 18 is made with a flange 22 and a lip 24 spaced slightly therefrom is peened over to confine a sheet metal disc 26 in rigid relation with the hub.

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The outer marginal portion 27 of the disc 26 is bent to the right slightly as viewed in Figures 1 and 3. This dished form of the disc 26 presents a concave surface for the attachment thereto of a sinuous sheet metal strip 30 which is made in annular form. Ridges at one side of the annular strip 30 are spaced and substantially rectangular and are affixed to the concave face of the disc 26 preferably by welding. It will be noted that the margin of the disc 26 is so dished as to form a dynamically well balanced construction. Conveniently and preferably, but not necessarily, the ridges fixed to the disc 26 may be made rectangular in form to facilitate the welding operation.

In order to lend added rigidity to the disc 26 the disc may be annularly crimped as shown at 32.

The ridges of the strip 30 are preferably affixed to the disc 26 by welding as stated above but is to be understood that they may be attached by soldering or riveting. Also, the ridges of the strip 30 may be flattened, as shown, to facilitate attachment to the disc. It will also be noted that the free ridges of the sinuous strip are adapted to come into unrestricted contact with the fluid to be handled. Compactness is assured by arranging the strip 30 annularly to surround the hub 18.

In operation the fluid enters the casing 12 by way of the opening 14 and is thrown radially by centrifugal action regardless of the direction of the rotation of the motor 10 and is forced out of the peripheral discharge opening of the casing.

I claim:

An impeller for centrifugally driving fluids from an inlet passage to an outlet passage comprising a single disc adapted to be rotated on an axis normal thereto, the outer marginal portion of said disc being bent to provide a concave surface on said disc facing said inlet passage, a sinuous sheet metal strip in annular form fixed on said marginal portion of said disc substantially coaxial therewith and extending from said disc toward said inlet passage, the undulations of said strip including opposed alternate ridges arranged in staggered relation, each of said ridges having a flat surface of rectangular contour lying in planes transverse to said axis, the flat rectangular surfaces of said ridges on one side of said strip being fixed to said disc, the flat rectangular surfaces of said ridges on the other side of said strip being free and cooperating with adjacent parts of said strip to define an annular series of pockets open in a direction parallel with said axis and extending toward said inlet passage, and said disc being the sole support for said strip.

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