

C. C. HARDER.
CENTRIFUGAL PUMP OR BLOWER.
APPLICATION FILED OCT. 8, 1908.

929,129.

Patented July 27, 1909.

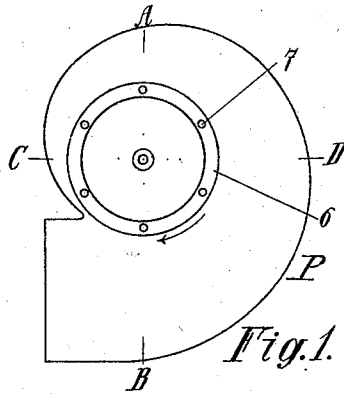


Fig. 1.

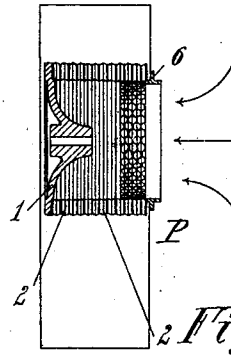


Fig. 2.

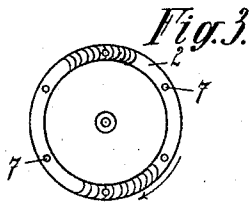


Fig. 3.

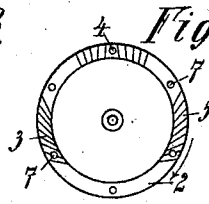


Fig. 5.

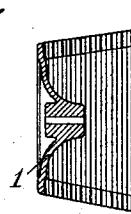


Fig. 7.

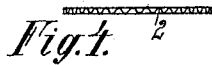


Fig. 4.

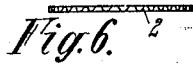


Fig. 6.

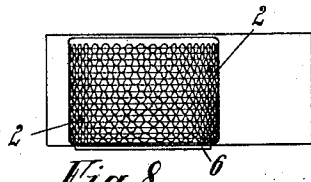


Fig. 8.

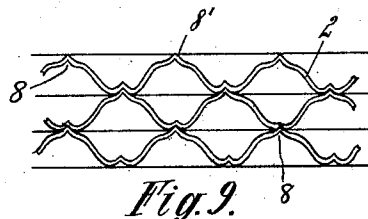


Fig. 9.

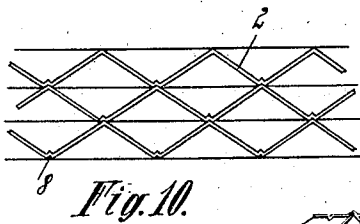


Fig. 10.

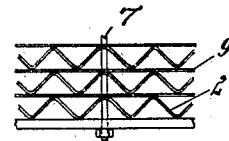


Fig. 11.

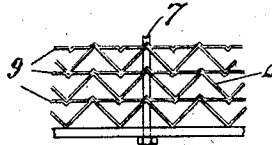


Fig. 12.

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UNITED STATES PATENT OFFICE.

CARL CAESAR HARDER, OF HAMBURG-HAMM, GERMANY, ASSIGNOR TO BERNHARD BOMBORN, OF BERLIN, GERMANY.

CENTRIFUGAL PUMP OR BLOWER.

No. 929,129.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed October 8, 1908. Serial No. 456,843.

To all whom it may concern:

Be it known that I, CARL CAESAR HARDER, merchant, a citizen of the town of Hamburg-Hamm, residing at 155 Ritterstrasse, Hamburg-Hamm, in the Empire of Germany, have invented certain new and useful Improvements in Centrifugal Pumps or Blowers, of which the following is a specification.

This invention relates to centrifugal pumps and blowers and more particularly refers to that class of pump or blower in which the liquid or the gas or air has an axial entry and tangential exit, but the invention can be applied equally well to centrifugal pumps and blowers with entries and exits in other positions.

Hitherto in this class of device it has been usual to employ blades fixed to a crown usually single, but this form of construction presented disadvantages both in strength and firmness and the bulk of the blades considerably reduced the capacity of the pump or blower and considerable friction arose through the whirlings or eddies which occurred around the periphery of the impeller and thus the efficiency of the pump or blower was considerably reduced.

The present invention particularly consists in an improved impeller, the main feature of which is that instead of employing blades, the same is constructed in form of a tube composed of individual corrugated rings and arranged in axial direction side by side, in such a manner that the recesses or projections formed by the corrugations of the adjoining rings are either adverse or displaced relative to one another, owing to which a net-like formation results.

According to the breadth of the pumps or blowers desired the impellers may be composed of any number of rings which may either directly bear against one another or be separated by other rings inserted between them in the manner hereinafter specified. For driving heavy liquids or for other purposes the rings may be made of cast metal, while for gas and air they may preferably be stamped or pressed out of sheet metal.

To make my invention more clear the same is illustrated in the accompanying drawing, in which similar reference letters denote corresponding parts and in which—

On the accompanying drawings Figure 1

shows the exterior view of a centrifugal-blower or a centrifugal-pump. Fig. 2 is a section on A—B of Fig. 1, the net-like structure or grain being only partially shown. Figs. 3 and 4, 5 and 6 show the lateral views and top-views of one of the rings of which the impeller consists. Fig. 7 is a section through a conically constructed impeller, the netlike structure not being shown for the sake of simplicity. Fig. 8 is a sectional view on the line C—D of Fig. 1 with a full top view of the impeller. Figs. 9 and 10 show the disks contacting against each other, somewhat enlarged and in various shapes. In Figs. 11 and 12 intermediate rings are also arranged between the disks.

With reference to the drawing P denotes the casing of the pump or blower, in which the medium is adapted to enter axially and to leave in radial or tangential manner. The impeller consists of a bearing part 1 which is adapted to fit on the driving shaft (not shown). Suitably secured to the bearing part 1 are rings 2 which may be either cast or made of stamped or cut sheet metal and may be either of curved, (Figs. 3, 4, 5, 6, 8, 9, 11) angular or rectangular (Figs. 10, 12) or any other shape.

In Fig. 3 the corrugations or net work are shown of curved shape, while in Fig. 5 they are straight but under different angles to the center.

For the attachment of the supply pipe (not shown) and for closing the pump or blower at that side a ring 6 may be employed which may be secured in position by axially extending bolts 7 engaging the bearing part 1, or in any other convenient manner. By the tightening of the bolts the individual rings are pressed against one another and form a rigid body.

To prevent the rings from becoming accidentally displaced relative to one another the projecting parts or tops of the corrugations of the rings may be alternately formed with cavities 8 (Fig. 10), or projections 8' and cavities 8 (Fig. 9), whereby the adjacent rings will be engaged with one another (Figs. 9 and 10).

The impeller is suitable for receiving the medium from either side. Its longitudinal sectional shape may vary, as for instance, in Fig. 7 the rings are shown as being of constantly increasing diameter from left to

right, thus forming an impeller of truncated cone shape. It is understood, however, that other modifications may be made without departing from the spirit of my invention.

In the modifications shown in Figs. 11 and 12 the rings are arranged relative to one another in such a position that their corrugations extend parallel to one another, and the tops thereof do not meet as in the former modifications. In such cases intermediate rings 9 are arranged between the adjacent rings 2. The intermediate rings may also be provided with cavities 8 similar to the cavities 8 in Figs. 9 and 10, and the projecting parts or tops of the corrugations may be made to engage said recesses, to prevent relative displacement of the rings.

The chief advantage of my invention consists in that the construction of pumps or blowers is extremely simple and the breadth of the latter may be varied according to requirements by increasing or decreasing the number of individual rings.

Another advantage of my invention is that the parts of the impeller wheel are not apt to be thrown out by a centrifugal force because of their annular shape.

What I claim and desire to secure by Letters Patent is:—

1. In centrifugal pumps and blowers, an impeller composed of individual corrugated rings and arranged axially side by side, the corrugations serving as blades, and means for joining the individual rings to a rigid body and preventing their relative displacement.

2. In centrifugal pumps and blowers, an impeller composed of individual corrugated rings and arranged axially side by side, the corrugations serving as blades, intermediate rings arranged between the corrugated rings, means for joining the individual rings to a

rigid body, and means for preventing the relative displacement of the individual rings.

3. In centrifugal pumps or blowers, an impeller composed of individual corrugated rings and arranged axially side by side and with their corrugations adverse to one another, said corrugations serving as blades, means for joining the individual rings to a rigid body, and means for preventing the relative displacement of the individual rings.

4. In centrifugal pumps or blowers, an impeller composed of individual corrugated rings and arranged axially side by side, and with their corrugations adverse to one another, said corrugations serving as blades, intermediate rings arranged between said corrugated rings, means for joining the individual rings to a rigid body, and means for preventing the relative displacement of the individual rings.

5. In centrifugal pumps or blowers, an impeller composed of individual corrugated rings and arranged axially side by side, the corrugations serving as blades and alternately formed at their tops with cavities to allow of the engagement of the adjoining rings with one another, and means for joining the individual rings with one another.

6. In centrifugal pumps and blowers, an impeller composed of individual corrugated rings and arranged axially side by side, the corrugations serving as blades, intermediate rings arranged between said corrugated rings and formed with cavities to engage the tops of the corrugations and a means for joining the individual rings with one another.

In testimony whereof I affix my signature in presence of two witnesses.

CARL CAESAR HARDER.

Witnesses:

ERNEST H. L. MUMMENHOFF,
OTTO W. HELLMRICH.