

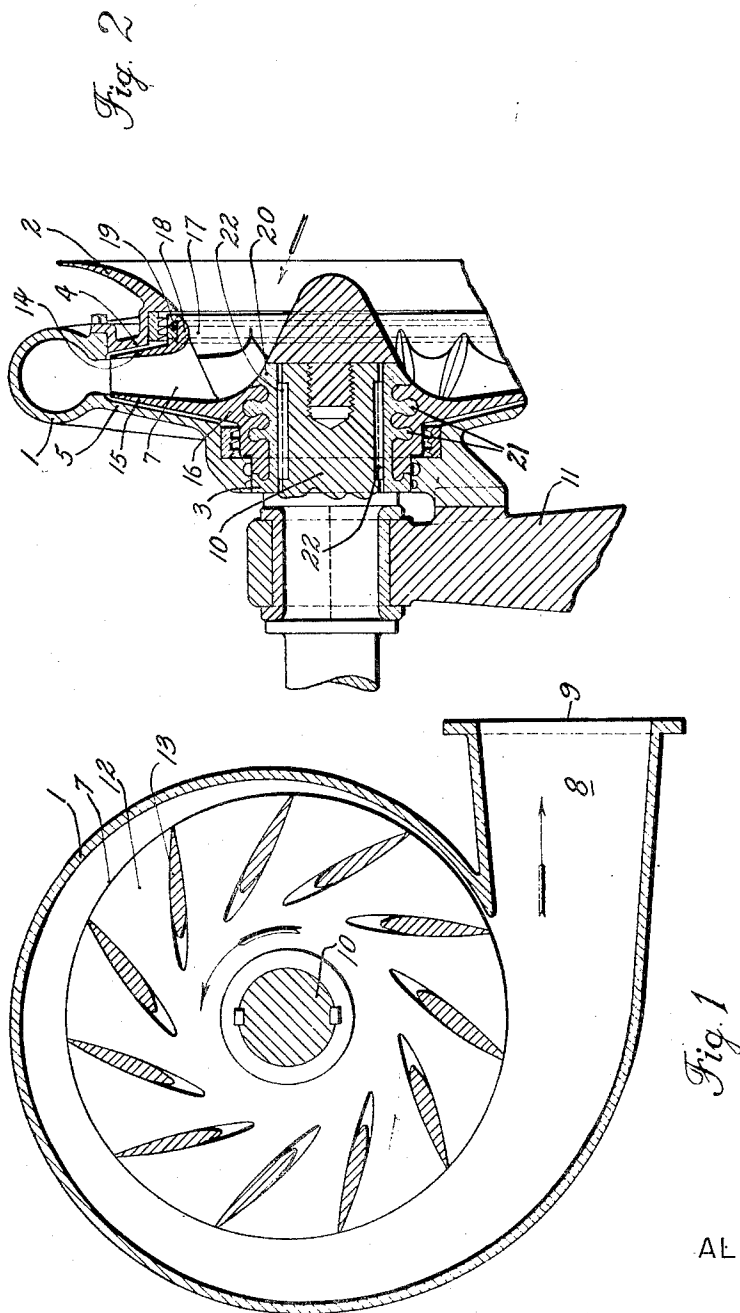
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COMPRESSING MACHINE SUCH AS CENTRIFUGAL BLOWER OR PUMP

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COMPRESSING MACHINE SUCH AS
CENTRIFUGAL BLOWER OR PUMP

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This invention relates to improvements on compressing machines, such as centrifugal blowers or pumps.

The invention is particularly concerned with rotors that are made of materials having inferior properties in regard to strength, such as light metals.

According to the invention, at least part of the maximum stressing by action of centrifugal force setting up particularly at the region adjacent to the axis of rotation of the rotor is resisted by rings, or the like, cast in with the metal of the rotor body and consisting of metal of great strength. The casting in of said reinforcements with the lighter metal of the rotor body is so effected that these form with said metal an inseparable unit and are embedded at least partly so as to be prevented from detaching from the rotor body.

The invention is illustrated, by way of example only, in the accompanying drawings, in which

Figs. 1 and 2 each depicts a cross section of a blower representing the subject matter of the invention.

Like numerals denote like parts.

In Figs. 1 and 2 the numeral 1 designates the blower casing. Onto one side of this casing a nozzle-like intake portion is screwed on. On the opposite side an opening 3 is arranged in the casing. Side walls 4 and 5 cover the rotor 7 laterally. A spiral portion 8 of the casing is, for example, flared so as to increase in width in the direction toward its exit 9. The rotor 7 is keyed to a driving shaft 10. The driving shaft 10 is mounted in a bearing support 11 in overhung relation thereto. The rotor is of the closed type. Passages 12 located between vanes 13 are closed by lateral discs 14, 15. The driving disc 15 of the rotor is provided with a hub portion 16 by means of which said disc is secured to the driving shaft 10. A closure disc 14 forms the entrance opening 17 for the actuated medium. It will be further observed that the hub 18 of the annular closure disc 14 is thickened relative to the latter.

As shown in Fig. 2, a flange-like hub portion 18 of the closure disc 14 has cast in with it, according to the invention, a reinforcing ring 19. This ring 19 is made of metal of great strength and of a high modulus of elasticity, for example, a high-quality alloyed steel. The ring is cast in with the closure disc 14 consisting of light metal directly during the operation of casting this disc and acts to resist a large part of the centrifugal forces setting up at high speeds of

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revolution. By this means a slight change of form of the rotor is obtained in the condition of operation at the same time.

The inside of the hub portion 16 of the rotor driving disc 15 has, according to the invention, cast in with it a sleeve-like part 20 consisting of a high-quality material. This part is provided with projecting bead like portions 21 which interlock with the adjacent light metal portions of the rotor disc 15. These bead-like projections, which may have any suitable form, also resist centrifugal forces acting upon the disc 15 specifically at the region of maximum straining, thereby increasing the allowable stressing and reducing expansion compared with a rotor body consisting of light metal throughout. Owing to the arrangement of the part 20, having great strength and being cast in with the light metal, interiorly of the rotor the advantage ensues that the driving keys 22 held by the driving shaft 10 bear exclusively against a stronger metal than represented by the softer light metal during the rotation. This results in a further advantage of this embodiment of the invention.

The invention can be applied also to rotors of other construction than that shown as well as to all or part of the rotors of pumps or blowers having several pressure stages.

The invention results in the advantage over that presented by rings shrunk on in hot state or having been shrunk on later under pressure that displacement or working loose in highly stressed state is impossible due to the ring being cast in with the light metal.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a centrifugal pump or blower having a power driven shaft, an impeller disc mountable upon said shaft, said disc comprising a prefabricated inner hub part formed as a sleeve of high quality metal, said sleeve having a raised annular flange-like portion at one of its axial extremities and an annular projection intermediate said extremities, said raised portion and said projection together with the wall of the sleeve therebetween defining an annular cavity, both said portion and said projection overhanging axially said cavity, said sleeve being provided with means to prevent rotation thereof about said shaft, the remainder of said impeller disc being comprised of a light lower quality metal cast about said sleeve and within said cavity to form a radially extending disc hub and blade-

supporting portion, and blades secured to the last said portion.

2. In a centrifugal pump or blower having a power driven shaft, an impeller disc mountable upon said shaft, said disc comprising a pre-fabricated inner hub part formed as a sleeve of high quality metal, said sleeve having raised annular flange-like portions, said raised portions together with the wall of said sleeve therebetween defining an annular cavity, both said portions overhanging axially said cavity, said sleeve being provided with means to prevent rotation thereof about said shaft, the remainder of said impeller disc being comprised of a light lower quality metal cast about said sleeve and within said cavity to form a radially extending disc hub and blade-supporting portion, and blades secured to the last portion.

3. An impeller as defined in claim 1 wherein the annular projection in axial section is bulb-like and the neck thereof merges with the outer wall of the sleeve.

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