

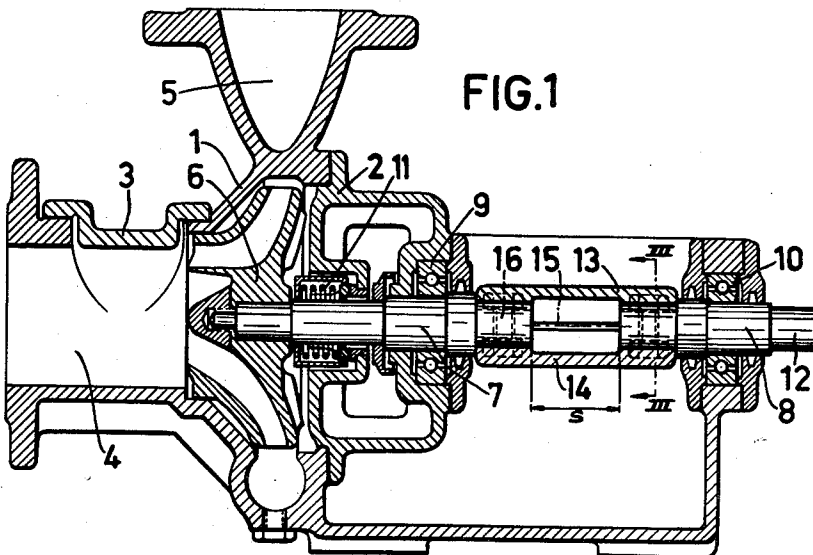
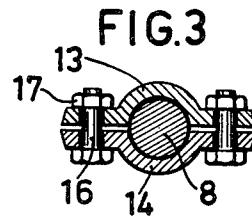
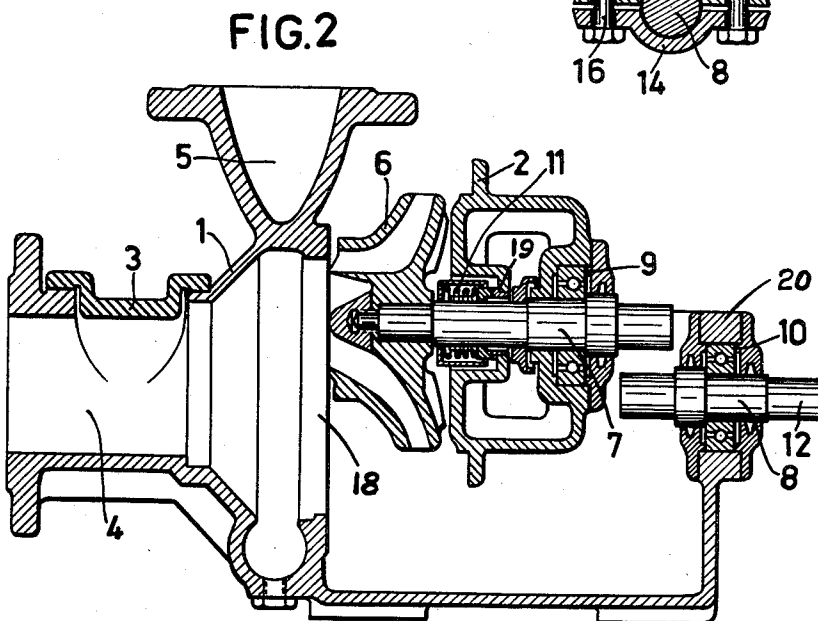
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CENTRIFUGAL PUMPS

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CENTRIFUGAL PUMPS

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This invention relates to centrifugal pumps having an impeller with one-sided inlet and a drive shaft which is rotatively supported in bearing means disposed solely at the far side of the impeller inlet.

Centrifugal pumps of the said general organization offer distinct advantages when used for the pumping of liquids containing suspended foreign matter, such as pulp, sewage and the like, since the inlet to the impeller may be shaped so as to permit a very direct influx of the liquid axially towards the centre of the impeller, there being no impeller shaft with bearing arrangements extending upstream of the impeller to cause obstructions in the inlet. The suction pipe may thus be connected directly to the housing portion surrounding the impeller inlet.

The pumping of liquids containing foreign matter will nonetheless necessitate periodic cleaning and maintenance of the pump, and this has involved such measures as loosening and displacing the suction and pressure conduits, the drive motor and other parts of the stationary structure in conventional pumps of the aforesaid type.

It is an object of the invention to provide in a pump of the type referred to means by which the rotary system of the pump may be easily removed for cleaning and maintenance purposes without need for disturbing the stationary structure, such as piping, drive motor and bearings.

From the following description in which reference is made to the accompanying drawing it will be evident how the invention may be carried out in practice.

In the drawing:

Fig. 1 is a longitudinal sectional elevation through a centrifugal pump,

Fig. 2 is a similar elevation as Fig. 1 during removal of the rotary system, and

Fig. 3 is a cross-sectional view along line III—III in Fig. 1.

The pump housing is generally denoted 1 and is covered on the side opposite to the inlet by a hollow cover member 2 provided with a flange secured to the housing 1 to close opening 18 by means of screws or the like (not shown). Further a cover 3 is provided at the inlet side of the housing 1 for cleaning purposes. The housing 1 is formed with an inlet section 4 and an outlet 5. Within the housing 1 a one-sided impeller 6 is disposed immediately downstream of the inlet section 4 and secured to an impeller shaft 7, 8 which is journaled in spaced bearings 9 and 10 both of which are disposed at that side of the impeller 6 being opposite to the inlet.

The bearing 9 as well as a stuffing box 11 which prevents liquid from leaking out from the pump housing is disposed in a bore 19 through the removable member 2. The impeller shaft is split in two portions, 7 and 8. The first shaft portion 7 by its one extreme end supports the

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impeller 6 and extends through the stuffing box 11 and the bearing 9, projecting some distance outside the member 2. The second shaft portion 8 extends through the bearing 10 mounted in bearing support 20 which is formed integral with the housing 1, and is formed with a projection 12 for connecting the drive motor (not shown) by means of a suitable coupling (not shown).

The ends of the shaft portions 7 and 8 facing each other are connected by a rigid coupling split along an axial plane 15 to form two halves 13 and 14 which are clamped to the shaft portions by means of bolts 16 and nuts 17 (Fig. 3). The coupling halves have of course to be accurately machined so that the shaft portions will be properly aligned. The shaft ends are separated by a gap *s* of such a width that the member 2 with stuffing box 11, bearing 9 and shaft portion 7 with the impeller 6 may be moved as a unit so far to the right after dismantling the coupling 13, 14 and loosening the connections between the housing 1 and the member 2 that it may be lifted clear from the pump housing, as illustrated in Fig. 2. The cleaning and maintenance of the pump housing and all other components thus may be easily effected after removing the rotary system as described above without the need for loosening and disturbing the stationary parts of the pump such as the housing 1 with piping and supports, the drive motor and the shaft portion 8 connected thereto.

The distance between the bearings such as 9 and 10 is rather great in pumps having the impeller supported on one side only. In pumps of this kind as hitherto known the space between the bearings has had no useful function. In the improved pump described above this space will accommodate the coupling means, and no additional space is required for the latter.

What I claim is:

1. A centrifugal pump assemblage comprising a unitary pump housing having opposed sides and mounting base therefor, a suction connection being provided on one side of said housing, an impeller in said housing, the side of said housing opposite said suction connection being provided with an opening in axial alignment with said suction connection of a diameter at least as large as said impeller, a cover for said opening, an axial bore in said cover, a first bearing in said bore, a first stub shaft rotatably mounted in said first bearing keyed to said impeller to support and rotate said impeller, a bearing support on said base spaced from said opening on the side of said housing remote from said suction connection, a second bearing in said bearing support in axial alignment with said first bearing when said cover is in place to cover said opening, a second stub shaft in said second bearing to be in alignment with said first stub shaft, the length of said first and second stub shafts being such as to provide axial space between the adjacent ends of said first and second stub shafts, said space having an axial length whereby removal of said impeller through said opening upon removal of said cover from said housing is facilitated to disassemble said impeller from said pump without disturbance of said second stub shaft, and a rigid coupling means engageable with the adjacent end of said first and second stub shafts, when in place, to rigidly secure said first and second stub shafts in axial alignment.

2. In a centrifugal pump as claimed in claim 1, the provision of sealing means in the form of a stuffing box for said first stub shaft section within said detachable cover member.

3. A centrifugal pump as claimed in claim 1, wherein

said rigid coupling means is formed as a sleeve member for connecting said shaft section ends, said sleeve member being divided in two halves along an axial plane, said halves being formed with means in the form of flanges for receiving clamping means in the form of bolts and nuts. 5

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