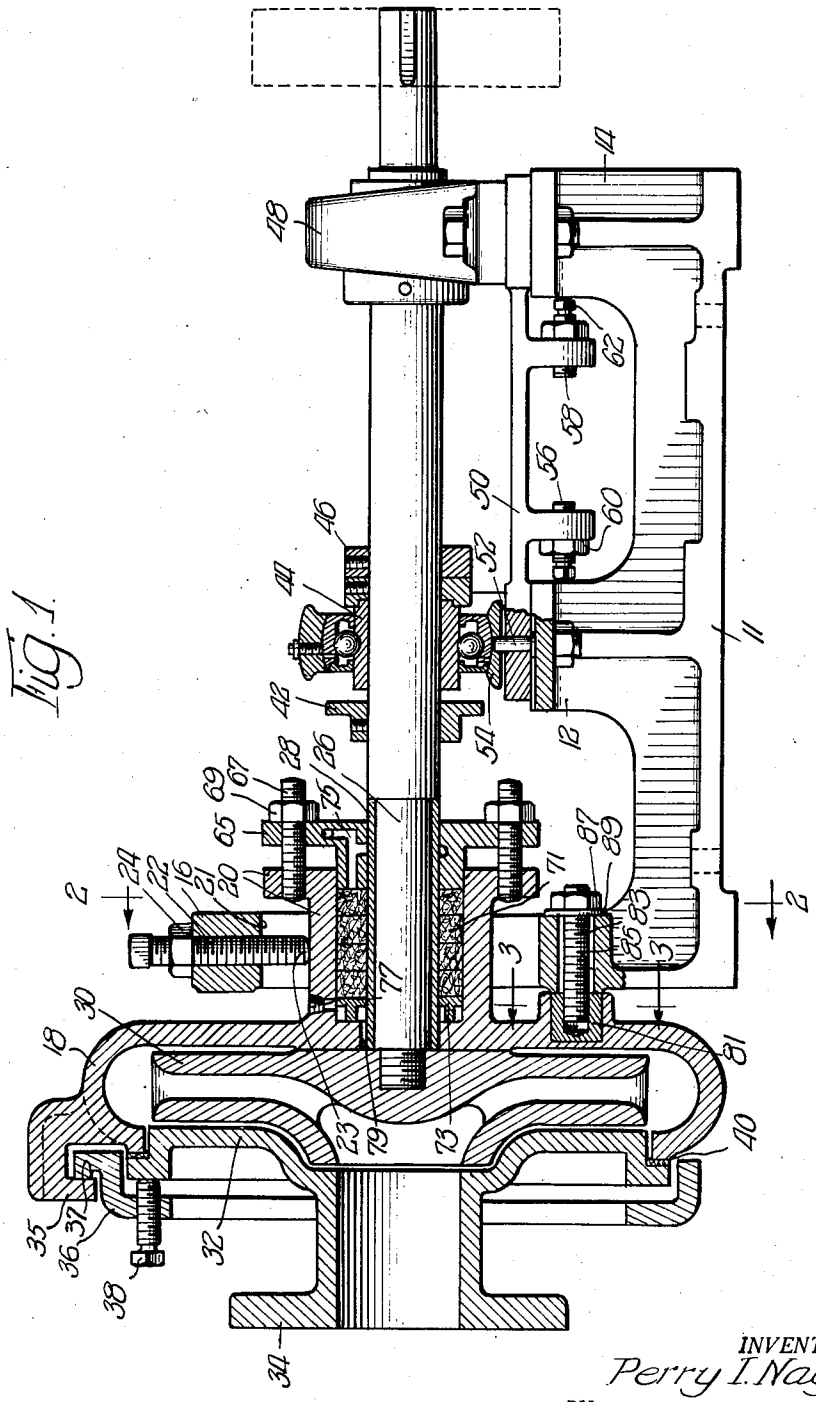
Dec. 2, 1958 P. I. NAGLE 2,862,453

ADJUSTABLE PUMP SUPPORT

Filed April 1, 1954 2 Sheets-Sheet 1

Fig. 1



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Filed April 1, 1954 2 Sheets-Sheet 2

Fig. 3

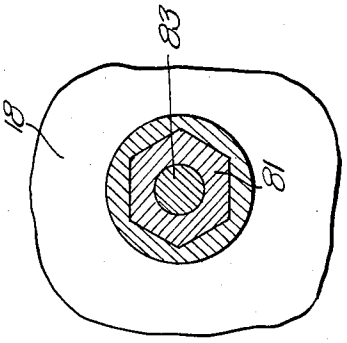
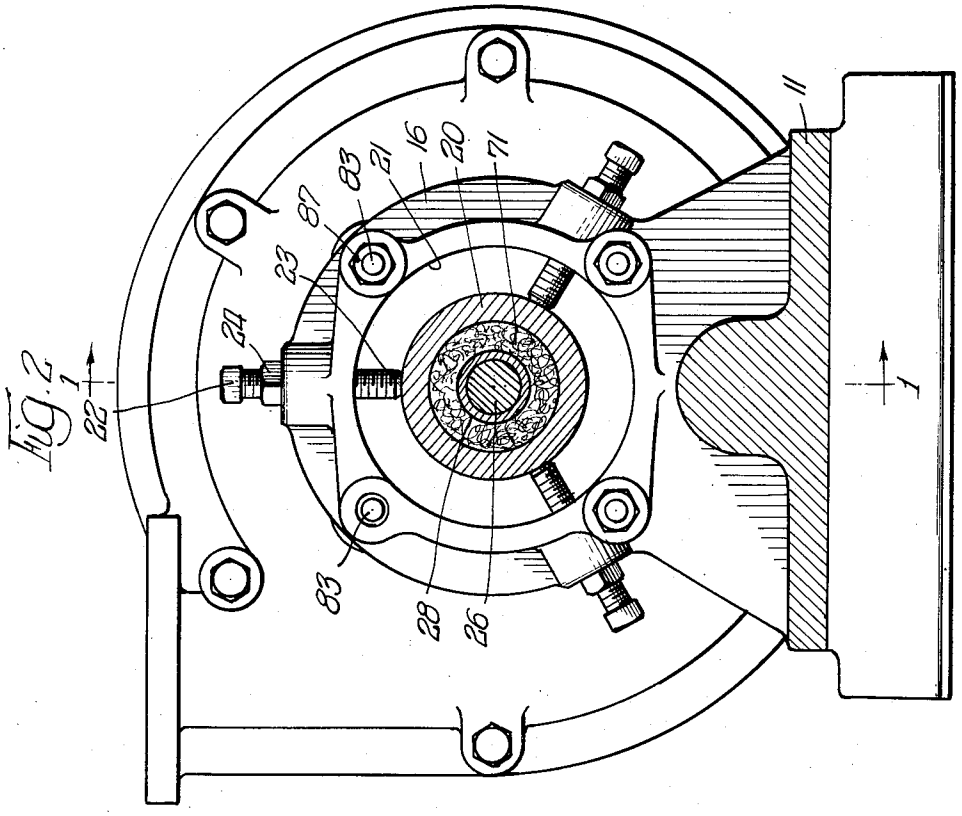


Fig. 2



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ADJUSTABLE PUMP SUPPORT

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Application April 1, 1954, Serial No. 420,335
3 Claims. (Cl. 103—103)

This invention relates to a new and improved pump mounting and more particularly to an adjustable mounting whereby a pump may be centered and accurately aligned with adjacent pump impeller shaft bearings.

Rotary pumps are used for moving many corrosive chemicals and also for handling various liquids carrying highly abrasive solids in suspension. In order to assure reasonable pump life, it is customary to form the casings for such pumps from alloys resistant to corrosion and abrasion. Such alloys are often so hard that machining of the casing, other than finishing meeting faces, is impractical or prohibitive in cost from a commercial standpoint. The pump casings are produced by a casting process and further finishing operations are held to the minimum. Rotary pumps of this character, however, operate at comparatively high speeds and it is important that the impeller and shaft be accurately aligned with the casing. Such shafts are often relatively long in order to keep the drive motor away from areas subject to corrosion or abrasion.

It is an object of the present invention to provide a new and improved adjustable mounting for pumps.

It is a further object to provide an adjustable mounting of this character permitting accurate and positive adjustment of a pump relative to the mounting.

It is an additional object to provide such a mounting especially adapted for use with a minimum of machine finishing of the pump to be mounted.

It is another object to provide a mounting of this type serving to adjust the pump casing in a plane and an associated shaft mounting for adjusting the shaft position along an axis at right angles to said plane.

It is also an object to provide a pump mounting which is simple in design and operation and is adapted for commercial production and use.

Other and further objects will appear as the description proceeds.

I have shown certain preferred embodiments of my invention in the accompanying drawing, in which—

Figure 1 is a side elevation of a pump and mounting, partly in section taken on line 1—1 of Figure 2;

Figure 2 is a transverse section taken on line 2—2 of Figure 1, and

Figure 3 is a fragmentary section taken on line 3—3 of Figure 1.

As shown in the drawings, the apparatus comprises a bearing stand 11 having bearing supporting portions 12 and 14. The stand 11 also includes a ring portion 16 which extends vertically at the left end of the stand for the purpose of supporting the pump casing 18. The pump casing 18 has the central bearing sleeve 20 extending through the opening 21 in the ring member 16. This ring member 16 carries three adjusting screws 22 which extend radially through the ring and have their inner ends 23 engaging the outer face of the sleeve 20. Locking nuts 24 are provided for maintaining the screws 22 in adjusted position.

The impeller shaft 26 is provided with a protective sleeve 28 extending through the pump casing sleeve 20. This shaft 26 is shown as threaded into the pump impeller 30. The pump casing 18 is closed by the plate 32 having the flanged intake opening 34. The pump casing 18 is provided with a plurality of spaced overhanging fingers 35. The plate 32 is held removably in position by means of the ring 36 and screws 38, the ring 36 being provided with a plurality of radially extending fingers 37, the ring 36 being inserted and rotated to bring the fingers 37 behind the overhanging fingers 35 on the pump casing 18. The packing 40 is provided between the plate 32 and casing 18. The particular construction of the pump itself forms no part of the present invention.

The shaft 26 carries a rotating finger 42 and passes through the thrust bearing 44. This bearing is mounted on the bearing supporting portion 12 of the bearing stand 11. The bearing lock collars 46 are secured to the shaft 26 so as to hold the inner member of thrust bearing 44 against longitudinal movement on the shaft. A radial bearing 48 is provided to the right of the thrust bearing 44 and is carried by the bearing supporting portion 14 of the bearing stand 11. The bearing stand is constructed to provide axial adjustment of the shaft 26 and, consequently, of the impeller 30 relative to the casing 18. The axial adjustment means comprises an adjustable carriage 50 through which passes a guide key 52, this key fitting in a recess in the outer member 54 of the thrust bearing 44. The adjustable carriage 50 may be longitudinally adjusted by means of the screws 56 and 58 which coact with adjacent vertical faces of the upstanding bearing supporting portions 12 and 14 of the adjustable carriage 15. The screws 56 and 58 are provided with the lock nuts 20 and 62, respectively, to maintain the carriage in adjusted position.

The casing sleeve 20 is provided with a gland follower 65 which fits about the shaft sleeve 28 and is adjustable by means of screws 67 and nuts 69. This adjustment serves to compress the packing 71 against the lantern ring 73. The gland follower 65 is shown as provided with a bore 75 for the introduction of grease. The sleeve 20 is further drilled and tapped at 77 for the connection of a pipe through which liquid under pressure may be introduced to provide a liquid seal between the pump chamber and area surrounding the impeller shaft sleeve 28. It will be understood that where corrosive material is being handled or where abrasive particles are entrained in the liquid being handled, it is important to keep the liquid handled from entering the casing sleeve 20 and engaging the gland construction and the impeller shaft 26 and its sleeve 28. The inner face 79 of the portion of the pump casing 18 immediately surrounding the end of the shaft sleeve 28 is spaced to provide a clearance so that the pressure of this liquid may prevent passage of the liquid being pumped.

The pump casing 18, in such constructions, is formed of extremely hard alloys and cannot be efficiently machined. For this reason, it may be desirable to have cast inserts 81 provided which can be formed of readily machinable metal. These inserts are tapped to receive the studs 83. These studs 83 pass through enlarged openings 85 formed in the ring portion 16 of the bearing stand 11. The nuts 87 mounted on studs 83 bear against washers 89 which are of efficient size to adequately cover the enlarged openings 85 and bear against the face of the ring 16.

In assembling the pump on the stand, the radial screws 22 are loosened and move out through ring 16 so as to clear the inner shoulder 21 on the pump casing sleeve 20. This sleeve 20 is then moved through the ring from left to right, as seen in Figure 1, until the casing bosses carrying inserts 81 bear against the left face of ring 16.

The screws **22** are then moved radially to engage the outer face of sleeve **20**.

Before this assembling movement, the shaft **26** and impeller **30** and gland follower **65**, together with associated elements, may be assembled in relation to the casing **18**. The bearing lock collar **46** may be placed on the shaft **26** as it is moved through the bearing **44** and on through bearing **48**. The screws **22** are now adjusted until the assembled parts are supported in such manner that the axis of the impeller shaft **26** is properly aligned both with the bearings and with the housing **18** and sleeve **20**. Screws **22** are then locked in adjusted position by lock nuts **24**, and nuts **87** are tightened up on studs **83** to secure the housing in accurate and permanent relationship to the stand. After this adjustment is secured, further axial adjustment of the impeller shaft **26** and impeller **30** may be made by means of the screws **56** and **58** and the adjustable carriage **50**. The completion of this adjustment then brings all the parts into their desired adjusted position, and the gland follower **65** may be tightened as desired.

It will be apparent that the construction is such that no machining is necessary of the hard alloy of the pump casing **18** in order to bring the parts into the final position required for efficient operation of the pump, with the impeller shaft properly aligned and axially adjusted.

While I have shown certain preferred embodiments of my improved construction, these are to be understood to be illustrative only as it is capable of variation to meet differing conditions and requirements, and I contemplate such modifications as come within the spirit and scope of the appended claims.

I claim:

1. A pump and mounting construction comprising a pump having a casing and an integral sleeve extending from the casing, an impeller in the casing and an impeller shaft extending through the casing sleeve, a bearing stand, said stand having a ring portion extending in spaced relation about the casing sleeve, and adjusting screws mounted in said portion, the screws extending radially of the shaft and having their inner ends engaging the casing sleeve, and axially extending means for securing the ring portion and casing together in adjusted position.

2. A pump and mounting construction comprising a pump having a casing and an integral sleeve extending from the casing, an impeller in the casing and an impeller shaft extending through the casing sleeve, a bearing stand, said stand having a ring portion extending in spaced relation about the casing sleeve, and adjusting screws mounted in said portion, the screws extending radially of the shaft and having their inner ends engaging the casing sleeve, and means for securing the ring portion and casing together in adjutsed position, said means comprising threaded studs extending axially from the casing, the ring portion being provided with enlarged openings to receive said studs, and nuts mounted on said studs bearing against the outer face of the ring portion.

3. A pump and mounting construction comprising a pump having a casing and an integral sleeve extending from the casing, an impeller in the casing and an impeller shaft extending through the casing sleeve, a bearing stand, said stand having a ring portion extending in spaced relation about the casing sleeve, adjusting screws mounted in said ring portion and extending radially inward from said ring and engaging the outer face of the casing sleeve to adjust the location of the casing relative to the stand in a plane normal to the impeller shaft axis, a thrust bearing for the impeller shaft carried by said bearing stand, and means for adjusting said bearing and the impeller and shaft in an axial direction.

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