July 29, 1969 M. POTTS 3,457,872

VANE TYPE PUMPS

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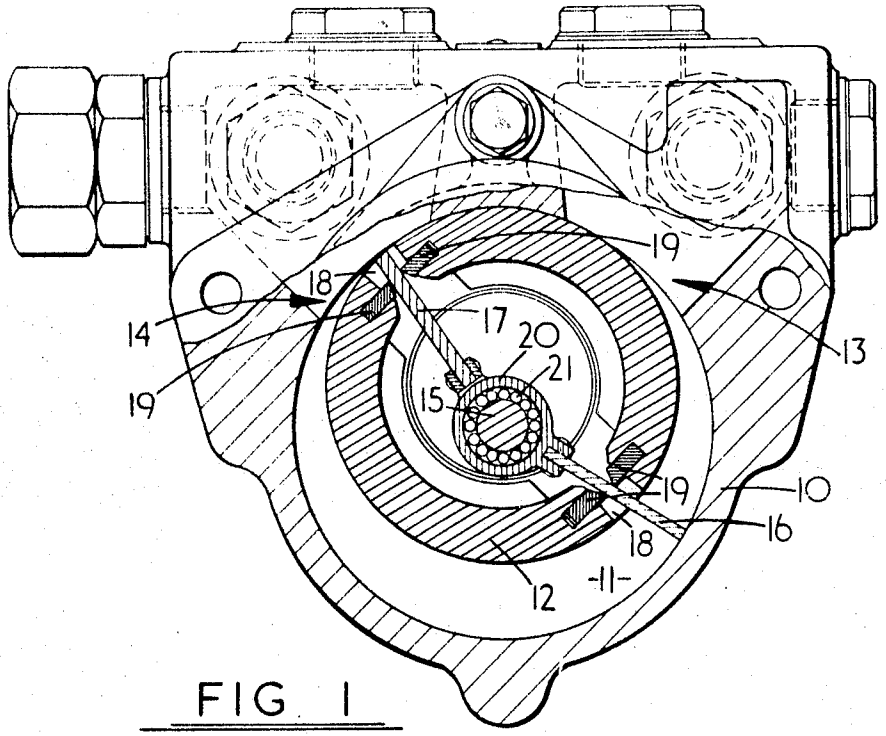


FIG 1

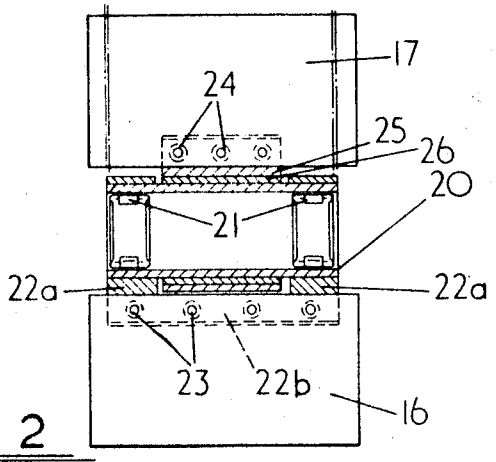


FIG 2

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VANE TYPE PUMPS

Filed July 27, 1967 2 Sheets-Sheet 2

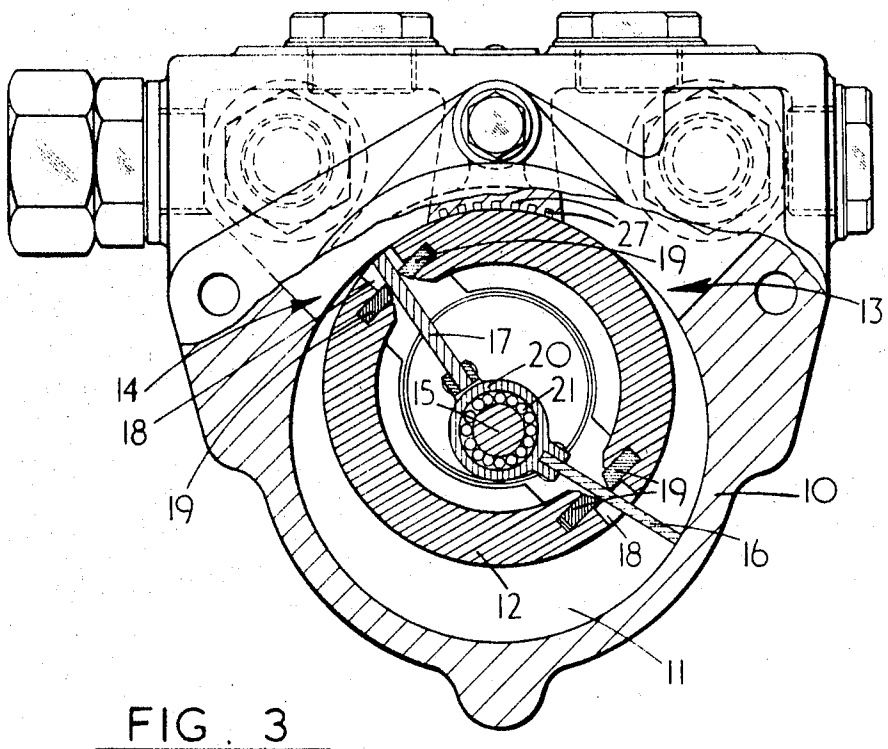


FIG. 3

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VANE TYPE PUMPS

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ABSTRACT OF THE DISCLOSURE

In a vane type pump having a hollow body containing a rotatable off-set member, the vanes are mounted upon a spindle by mounting one of the vanes directly thereon and mounting the other or others upon said one vane, permitting angular movement between the vanes.

This invention relates to vane type pumps of the kind comprising a body defining an interior cylindrical cavity having an inlet and an outlet, a hollow member mounted within the body for rotation about an axis offset from the axis of the cavity, a spindle mounted concentrically within the cavity and disposed within the hollow member, said spindle having journalled thereon at least two relatively movable vanes arranged to extend through respective spaced openings in the wall of the hollow member, rotation of the hollow member within the body causing the vanes successively to sweep the space defined between the hollow member and the cavity wall, the vanes being rotated about the spindle and being moved angularly with respect to one another as they rotate. Such a pump will be referred to for convenience as being of the kind specified.

It has previously been proposed to provide vane pumps of the kind specified in which each of the plurality of vanes is mounted independently on the spindle through its own roller bearing. This is a relatively expensive construction.

An object of the present invention is to provide a less expensive means of mounting the vanes on the spindle than has been the case in previously proposed arrangements.

According to the present invention there is provided a vane type pump of the kind specified in which one of the vanes is mounted for rotation about the spindle and the other vane or vanes are mounted on said one vane so as to permit relative angular movement between the vanes.

Embodiments of the invention will now be described, by way of example, with reference to the accompany drawing in which:

FIGURE 1 is a cross-sectional view of a first embodiment of pump embodying the invention,

FIGURE 2 is a cross-sectional view of a pair of vanes and their mounting for use in the pump illustrated in FIG. 1 and,

FIGURE 3 is a cross-sectional view of a second embodiment of pump embodying the invention.

Referring to FIGS. 1 and 2 of the drawings, a vane pump comprises a body **10** defining an interior cylindrical cavity **11** within which is mounted a hollow cylindrical member **12**. The exterior wall of the member **12** engages in sealing fashion the wall of the cavity **11** at a position between an inlet **13** and an outlet **14** to the cavity **11**, both the inlet **13** and outlet **14** being formed in the body **10**.

Mounted in the body **10** and concentrically with the

cavity **11** is a spindle **15** upon which is carried a pair of vanes **16**, **17** which extend through slots **18** in the wall of the member **12** and the seals **19** engage each side face to each vane.

The vanes **16**, **17** are mounted on the spindle **15** in the following manner. A sleeve **20** is mounted through the intermediary of a pair of spaced roller bearings **21** on the spindle **15** and the sleeve **20** has fixedly secured thereto a clamp which has portions **22***a*, which encircle the sleeve **20** at each of its ends and a pair of integral crosspieces **22***b* extend therebetween. The vane **16** is secured between the crosspieces **22***b* by means of rivets **23**. The vane **17** is secured by rivets **24** to a clamp **25** mounted through a plain bearing **26** on the sleeve **20** between the portions **22***a*.

By means of the above-described mounting of the vanes **16** and **17**, the roller bearings **21** are suitable to permit relative rotation between the spindle **15** and sleeve **20** and the plain bearing **26** is all that is necessary for the small amount of relative angular movement which takes place between the vanes **16** and **17** during operation of the pump. Furthermore the centrifugal loads on the bearings are applied largely to the bearing **26**, thus relieving the rotating bearings **21**.

It is to be understood that the pump can carry a larger number of vanes than described above and in such a case one vane is mounted directly upon the spindle **15**, whilst all of the others are mounted on that one vane through appropriate plain bearings or equivalent relatively inexpensive bearings which are suitable for the small amount of relative angular movement between the vanes during operation of the pump.

In the pump shown in FIG. 3, the pump and method of mounting the vanes is identical to that described in the pump shown in FIGS. 1 and 2, with the exception that in FIG. 3 the pump is provided with a labyrinth seal on the wall of the cavity **11**. The seal consists of a series of grooves **27** running parallel to the spindle **15**.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A vane type pump comprising a body defining an interior cylindrical cavity, said body having an inlet and an outlet, a hollow member rotatably mounted within the body cavity about an axis off-set from that of the cavity, a spindle mounted concentrically within the body cavity and within the hollow member, at least two relatively movable vanes journalled on the spindle, said vanes extending through respective spaced openings in the wall of the hollow member, one of the vanes being directly mounted for rotation on the spindle through a roller bearing, and the other vane being mounted upon said one vane through a plain bearing, to permit relative angular movement between the vanes.

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123—16; 230—57