June 2, 1970 A. BLUM 3,515,495

SUBMERSIBLE PUMP ASSEMBLAGE

Filed Feb. 27, 1968

Fig. 1

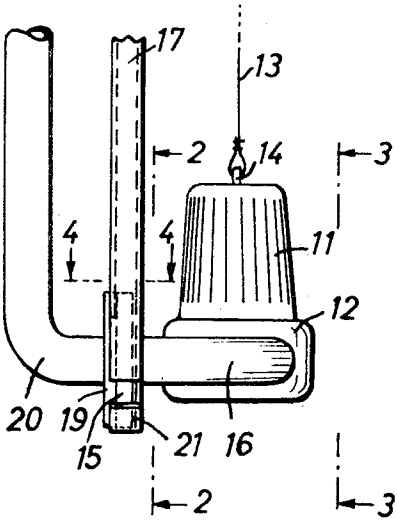


Fig. 2

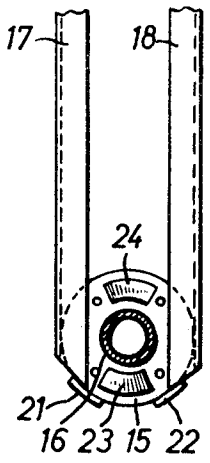


Fig. 3

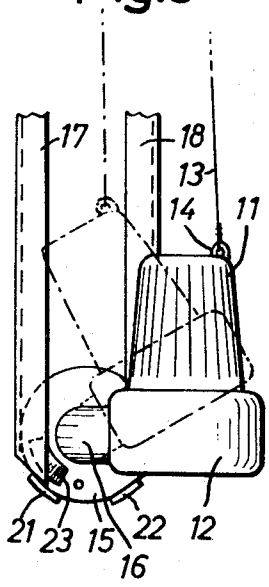
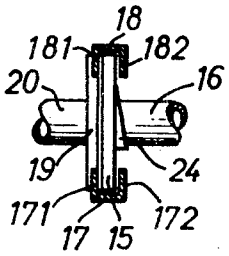


Fig. 4



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SUBMERSIBLE PUMP ASSEMBLAGE

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U.S. Cl. 415—126 5 Claims

ABSTRACT OF THE DISCLOSURE

This invention is essentially concerned with a submersible pump assembly wherein guide means are provided for guiding a pump into a liquid to be pumped, such that downward movement of the pump effectively connects the pump outlet to a delivery conduit.

BACKGROUND OF THE INVENTION

As is well known to those versed in the art, submersible pumps, as in waste and sewage systems, and otherwise, require examination and service at certain intervals. This presents problems in removal and replacement of the pumps, as by connection and disconnection of the pump outlet and tank delivery conduit.

SUMMARY

In accordance with the teachings of the instant invention, there is proposed a unique pump assemblage wherein the above-mentioned difficulties are obviated, there being provided an extremely simple means for lowering a pump into the medium to be pumped and effecting secure and tight coupling between the pump outlet and delivery conduit, as well as reversal of this procedure to disconnect the conduits and remove the pump.

It is a further object of the present invention to provide a pump assemblage including a unique pump outlet conduit structure for use in the instant assemblage, which outlet conduit structure may be employed for connection to conventional delivery conduits, thereby minimizing cost and simplifying stockkeeping.

It is still another object of the present invention to provide a pump assemblage having the advantageous characteristics mentioned in the preceding paragraphs, which is extremely simple in construction, durable and reliable throughout a long useful life, and can be economically manufactured for substantial savings in maintenance and servicing costs.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view showing a pump assemblage of the present invention, illustrating a pump assembled therewith.

FIG. 2 is a sectional elevational view taken generally along the line 2—2 of FIG. 1.

FIG. 3 is an elevational view taken generally along the line 3—3 of FIG. 1, illustrating a removal and replacement position of the pump in phantom.

FIG. 4 is a partial horizontal sectional view taken generally along the line 4—4 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawing, a submersible pump assemblage is there shown as including an electric motor or pump drive **11**, superposed on a pump housing or pump proper **12**. The unitary motor **11** and pump housing **12** are suspended by a flexible line or carrier cable **13** suitably connected to the assembly, as by an eye **14** anchored to the upper end of the pump motor **11**. As best seen in FIG. 3, the eye or fastener **14** is preferably connected to the upper side of the pump motor **11** at an offset location, adjacent to one edge thereof. By this location of eye **14**, the pump motor and housing **11**, **12** assumes a gravitational position shown in phantom in FIG. 3 upon being raised and lowered as suspended by the cable **13**.

Projecting from the pump housing **12**, generally tangential thereto and offset therefrom on the side remote from the cable connection **14**, is an outlet conduit or pipe **16**. Fixed on the outer end of the outlet pipe **16**, extending peripherally thereabout, is a connection flange **15** disposed in a vertical plane generally parallel to the axis of the pump **11**, **12**.

Fixedly mounted by any suitable means in a receiving vessel or the like are a pair of generally vertically extending, parallel spaced guide rails **17** and **18**. The guide rails **17** and **18** may each be defined by a U-shaped channel, arranged in parallel spaced facing relation, the channel **17** having side walls or flanges **171** and **172**, while the channel **18** has side walls or flanges **181** and **182**. As best seen in FIG. 4, the flanges **171** and **181** of respective channels **17** and **18** are generally coplanar with each other, as are flanges **172** and **182**.

Connected to the coplanar channel flanges **171** and **181** is an attachment flange **19**, as by welding or other suitable fixed connection means, so that the flange or coupling element **19** has its front face flush with the inner surfaces of the channel flanges **171** and **181**. The flange **19** may be generally annular, and fixedly secured to the central opening thereof is a pressure or delivery conduit **20**, which extends to a delivery location (not shown).

Fixedly secured on the lower ends of guide rails or ways **17** and **18**, or on the under edge of connection flange **19**, are a pair of limit members or stops **21** and **22**. On the outer or rear face of outlet conduit connection flange **15**, extending arcuately thereabout, may be one or more cams **23** and **24**, say of wedge-shaped configuration, for a purpose appearing presently.

The mounting of a pump **11**, **12** requires only engagement of the outlet conduit connection flange **15** in the upper ends of guide rails or ways **17** and **18**, and lowering of the pump by cable **13**. The connection flange **15** is freely slidable downwardly within the guide rails or ways **17** and **18** to guide the pump **11**, **12** to the position shown in phantom in FIG. 3, when the flange **15** engages the limit or stop members **21** and **22**. At this time further downward movement of the flange **15** in the guide means **17**, **18** is prevented, and the connection flange is constrained to rotate in the guide means, as to the solid-line position in FIG. 3. That is, upon slack in cable **13** the center of gravity of the pump assembly **11**, **12** effects rotation thereof, which simultaneously engages the cams **23** and **24** with the channel flanges **172** and **182** to urge the connection flange **15** into firm facing sealed relation with the delivery conduit flange **19**. If desired, any suitable gasket means may be interposed between the flanges **15** and **19**.

Removal of the pump **11**, **12** is, of course, effected by mere reversal of the above-described procedure. That is, tension is applied to the cable **13** to rotate the pump **11**, **12** from its solid-line position of FIG. 3 to its

phantom position. When in the phantom position, or approximately so, the cam means or wedges **23** and **24** have disengaged from the guideways **17** and **18**, so that continued tension exerted upon the cable **13** will serve to raise the pump assembly, the connection flange **15** sliding upward in the channels **17** and **18**.

From the foregoing, it is seen that the present invention provides a pump assemblage which fully accomplishes its intended object and is well adapted to meet practical conditions of manufacture, installation, maintenance and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In combination, a submersible pump, outlet conduit extending from said pump, a flange secured to said outlet conduit, cam means carried by said flange, a delivery conduit having a receiving opening, and guide means comprising ways associated with the receiving opening of said delivery conduit, said ways receiving said flange, said pump having its center of gravity off-set from the center of rotation of said flange in said ways to gravitationally rotate said flange in the ways, and said ways being engageable with said cam means to urge the outlet conduit into sealed connection with said delivery conduit as said flange rotates in the ways.

2. The combination according to claim **1**, said cam means comprising an inclined surface extending annularly about said outlet conduit and engageable with said ways upon rotation of said pump to urge said outlet conduit into said sealed connection.

3. The combination according to claim **2**, said ways comprising vertically extending channels slidably receiving said outlet conduit flange for guiding said pump between an upper inoperative position and a lower operative position.

4. The combination according to claim **3**, in combination with upwardly facing limit means associated with said channels for limiting the downward movement of said pump.

5. The combination according to claim **4**, said flange being generally circular for sliding and rotating movement in said ways, said limit means being located for engagement with said flange, and said pump having its center of gravity offset from the center of rotation of said flange in said ways, whereby said limit means engages said flange to limit downward movement thereof and said pump gravitationally rotates said flange to effect said cooperating action between said cam means and ways.

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U.S. Cl. X.R.

103—218; 415—219, 501