Aug. 27, 1957 E. T. LORIG ET AL 2,804,020

BELT PUMP

Filed Feb. 5, 1954

FIG. 1.

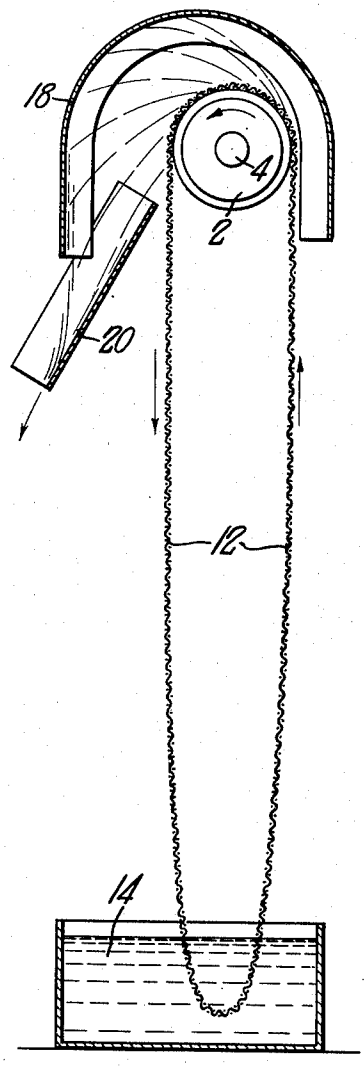


FIG. 2.

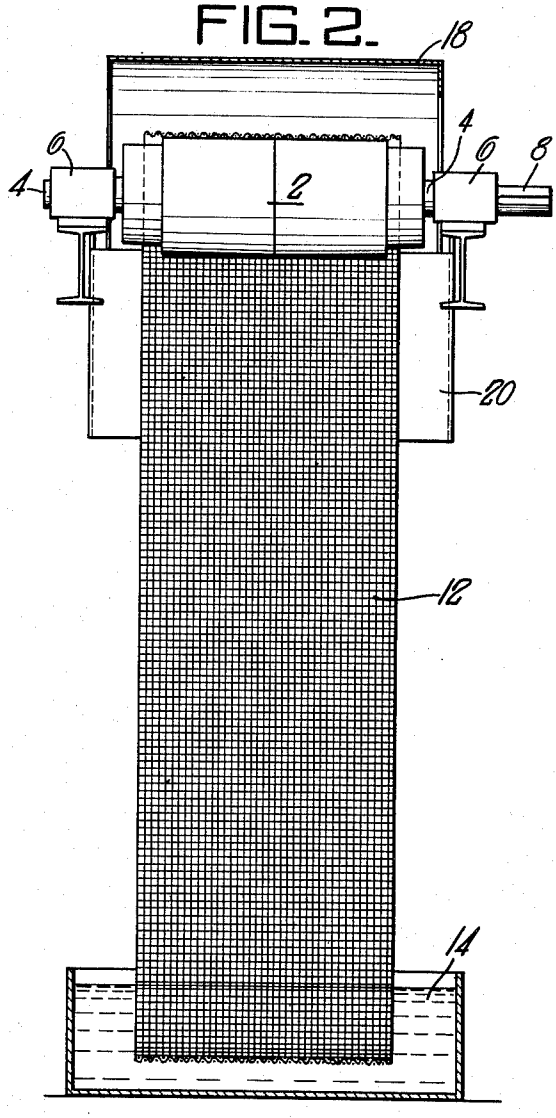
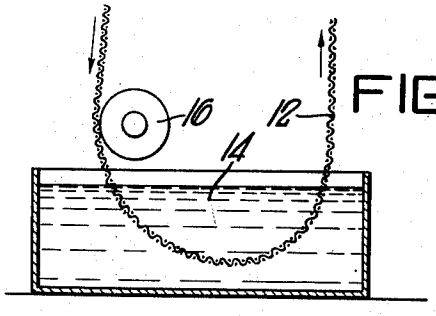


FIG. 3.



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BELT PUMP

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4 Claims. (Cl. 103—72)

This invention relates to a belt pump for lifting water or other liquid without the use of piping. There are many pumps on the market but those in general use are rather expensive both in initial cost and in upkeep, especially when handling dirty or abrasive liquids.

It is an object of our invention to provide a pump which is simple in construction and operation and which can be moved from place to place without difficulty.

Another object is to provide such a pump which cannot clog or be overloaded.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a vertical sectional view of the pump of our invention;

Figure 2 is a view, partly in section, taken substantially at the supporting roll; and

Figure 3 is an enlarged view of a detail.

Referring more particularly to the drawings, the reference numeral **2** indicates a self-centering roll arranged with its axis substantially horizontal. The particular roll shown is of the type disclosed in the patent to Lorig No. 2,592,581, dated April 15, 1952. Other self-centering rolls, such as those disclosed in the patents to Lorig Nos. 2,593,157 and 2,593,158, dated April 15, 1952, may also be used. Each of these types of rolls is so constructed that it has surfaces on opposite sides of the transverse center of the roll which develop forces in contact with the object passing thereover, which forces have components directed axially toward the transverse center. The roll **2** is provided with shaft sections **4** extending from the body of the roll and supported in bearings **6**. A shaft extension **8** is provided at one end of the shaft for connection to a motor or other drive means (not shown). Any suitable motor such as gas, diesel or electric may be used for driving the shaft **4**. An endless belt **12** passes around the roll **2** and extends downwardly into the liquid **14** to be pumped. The belt **12** may be made of various types of material such as double woven wire belting, porous fabric or the like. The weave should be balanced and it is absolutely necessary that the material have a plurality of openings therethrough. In other words, it must be perforated so that there will be openings for the liquid to enter. Balanced weave belts are well known in the art and various types are disclosed in the patents to Swinscoe No. 712,212, dated October 28, 1902, and Pink Nos. 1,803,144, dated April 28, 1931, and 1,947,357, dated February 13, 1934. If desired, the roll **2** may be full-bodied, that is have a supporting surface as wide as or wider than the width of the belt, or it may be narrow-bodied as shown, that is have a supporting surface less than the width of the belt. In some instances a solid narrow-bodied roll may be used. In case it is desired to have more of the belt in the liquid a snubber roll **16** may be provided adjacent the bottom of the belt as shown in Figure 3. In order to direct the discharge of liquid from the belt **12** a shroud

18 is provided around the belt and roll **2**. A discharge chute **20** is provided at the end of the shroud **18**. In operation the roll **2** is rotated to move the belt **12**. As the belt passes through the liquid **14** the liquid passes into the openings and is carried thereby until it is thrown therefrom by centrifugal force as it passes around the roll **2**. The shroud **18** directs the liquid into the discharge chute **20**. The belt **12** is subjected to external forces which tend to throw it side ways off the roll **2** but these forces are resisted by the centering force of the roll **2**, thus maintaining the belt substantially in centered position.

While one embodiment of our invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. A belt pump for lifting a liquid comprising a roll located above said liquid and arranged with its axis substantially horizontal, means for rotating said roll, and an endless belt surrounding and supported by said roll with its lower portion extending into said liquid, said belt having a balanced weave with a plurality of openings therethrough, said roll having a substantially cylindrical belt supporting surface of less width than the width of said belt, a shaft for supporting said roll, and a support for each end of said shaft located outside the belt supporting surface of said roll.

2. A belt pump for lifting a liquid comprising a self-centering roll located above said liquid and arranged with its axis substantially horizontal, a shaft for supporting said self-centering roll, a support for each end of said shaft, said self-centering roll having a belt supporting surface on each side of a transverse central split in the roll and means for causing said belt supporting surfaces to rotate in unison, said belt supporting surfaces developing forces having components directed axially on the belt toward said transverse center, means for rotating said roll, and an endless belt surrounding and supported by said roll with its lower portion extending into said liquid, said belt having a balanced weave with a plurality of openings therethrough, said roll having a substantially cylindrical belt supporting surface of less width than the width of said belt.

3. A belt pump for lifting a liquid comprising a roll located above said liquid and arranged with its axis substantially horizontal, means for rotating said roll, an endless belt surrounding and supported by said roll with its lower portion extending into said liquid, said belt having a balanced weave with a plurality of openings therethrough, said roll having a substantially cylindrical belt supporting surface of less width than the width of said belt, a shaft for supporting said roll, a support for each end of said shaft located outside the belt supporting surface of said roll, and a shroud surrounding the upper part of said roll to direct the flow of liquid thrown from the belt in the desired direction.

4. A belt pump for lifting a liquid comprising a self-centering roll located above said liquid and arranged with its axis substantially horizontal, a shaft for supporting said self-centering roll, a support for each end of said shaft, said self-centering roll having a belt supporting surface on each side of a transverse central split in the roll and means for causing said belt supporting surfaces to rotate in unison, said belt supporting surfaces developing forces having components directly axially on the belt toward said transverse center, means for rotating said roll, an endless belt surrounding and supported by said roll with its lower portion extending into said liquid, said belt having a balanced weave with a plurality of openings therethrough, said roll having a substantially

cylindrical belt supporting surface of less width than the width of said belt, and a shroud surrounding the upper part of said roll to direct the flow of liquid thrown from the belt in the desired direction.

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