

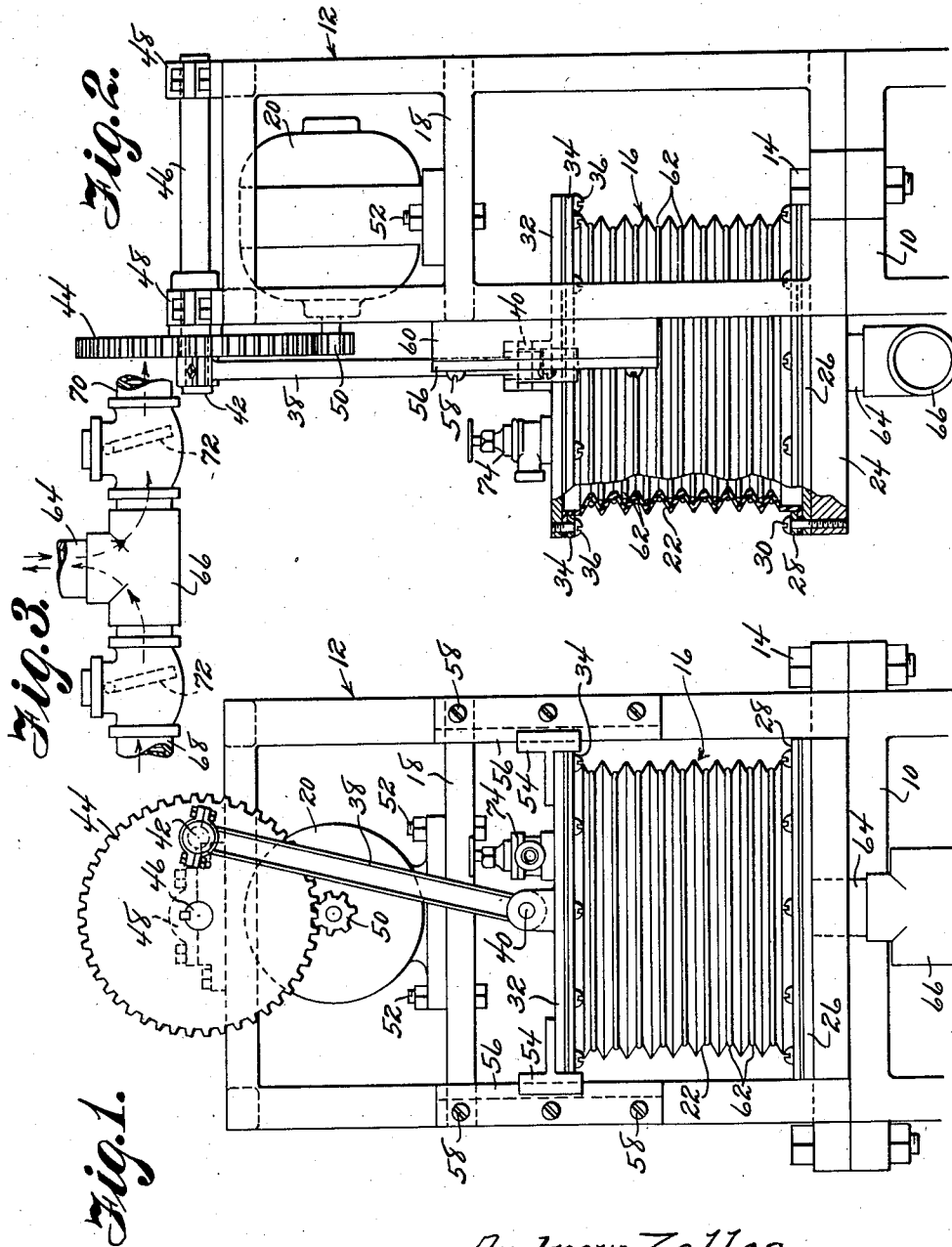
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PUMP

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PUMP

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4 Claims. (Cl. 103—148)

This invention relates to pumps, and has among its objects and advantages the provision of an improved bellows unit of relatively simple construction and designed to operate in an efficient manner.

In the accompanying drawing:

Figure 1 is an elevational view of a pump in accordance with my invention.

Figure 2 is a similar view with the pump structure rotated 90 degrees about a vertical axis, and

Figure 3 is a view of an inlet and outlet valve means.

In the embodiment of the invention selected for illustration, I make use of a base structure 10 upon which is mounted a frame 12, as by bolts 14. A pump unit 16 is mounted on the frame 12, which frame includes an upper deck 18 serving as a mount for a motor 20 for operating the pump.

The pump unit 16 comprises a bellows 22 of the accordion type arranged vertically on a lower deck 24 of the frame 12. A plate 26 comprises the lower end of the unit 16, and the bellows 22 has its lower end clamped between the plate 26 and a ring 28. Bolts 30 extend through the ring 28 and the plate 26 and is threaded into the deck 24 for fixedly securing the lower end of the bellows. A plate 32 comprises the upper end wall of the bellows 22, the upper end of the bellows being clamped between the plate and a ring 34. Bolts 36 extend through the ring 34 and are threaded in the plate 32 to fixedly secure the bellows between the ring and the plate.

A connecting rod 38 has one end pivotally connected at 40 with the plate 32 and its other end pivotally connected with a crank pin 42 on a gear 44 fixed to a shaft 46 rotatably supported in bearings 48 mounted on the upper end of the frame 12. The motor 20 is connected directly with a pinion 50 meshing with the gear 44. Bolts 52 fixedly connect the motor 20 with the deck 18.

The pivotal connection 30 is located centrally of the plate 32. To this plate are bolted two channel shaped guides 54, which are located at diametrically opposite points on the plate. Plates or tracks 56 are bolted at 58 to bodies 60 welded to the frame 12. These plates are loosely receivable in the guides 54 and are arranged vertically to guide the bellows 22 in its vertical and reciprocatory travel.

The plates 56 are of sufficient length to guide the bellows in all its lengthening and shortening positions. Extension of the bellows creates a suction condition which causes the bellows to fill with water or other liquid. Compression of the

bellows forces the liquid therefrom. Metal bands 62 are arranged internally and externally of the bellows 22 to reinforce the latter. This bellows may comprise strong fabric having an inside liner of rubber. The bands 62 maintain the folded contour of the bellows and reinforce the latter so that it is capable of withstanding heavy pressures.

A pipe 64 communicates with the lower end of the bellows 22 and connects with a T-coupling 66 communicating with an inlet pipe 68 and an outlet pipe 70. These pipes are respectively provided with check valves 72 for controlling the inlet and outlet flow. An air valve 74 is provided for the bellows 22 to release air therein as the bellows is being filled for pumping purposes.

Without further elaboration, the foregoing will so fully explain my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. A pump comprising a support, a pump unit mounted on said support, said pump unit including a bellows of the accordion type and having one end fixed to the support, the other end of said bellows including a rigid wall fixed to the bellows, said support including a frame, said frame being provided with two guide plates, channel shaped guides fixed to said rigid wall and slidably engaging said guide plates, a motor mounted on said frame and having a pinion, a gear rotatably mounted on said frame and meshing with said pinion, and a crank means operatively connecting said gear with said rigid wall.

2. A pump comprising a support, a pump unit mounted on said support, said pump unit including a bellows of the accordion type and having one end fixed to the support, the other end of said bellows including a rigid wall fixed to the bellows, a clamp ring, one end of said bellows lying between said rigid wall and said clamp ring, threaded means acting on the rigid wall and the clamp ring for securing the bellows therebetween, said support including a frame, a motor mounted on said frame and having a pinion, a gear rotatably mounted on said frame and meshing with said pinion, and a crank means operatively connecting said gear with said rigid wall.

3. A pump comprising a support, a pump unit mounted on said support, said pump unit including a bellows of the accordion type and having one end fixed to the support, said fixed end of the bellows being provided with an end plate and a clamp ring, one end of the bellows being positioned between said plate and said clamp ring, bolts extending through the clamp ring and said

plate and threaded into said support for fixedly securing the bellows between the clamp ring and the plate and the latter to the support, the other end of said bellows including a rigid wall fixed to the bellows, said support including a frame, a motor mounted on said frame and having a pinion, a gear rotatably mounted on said frame and meshing with said pinion, and a crank means operatively connecting said gear with said rigid wall.

4. A pump comprising a support, a frame mounted on the support and including upper and lower decks, a pump unit including a bellows of

the accordion type having one end fixed to the lower deck of the frame, bodies fixed to the frame, vertical track members on the bodies, a rigid wall fixed to the other end of the bellows, channel shaped guides fixed to the rigid wall and slidably engaging in the tracks, a motor mounted on the upper deck of the frame and having a drive pinion, a gear rotatably mounted on the frame and meshing with the pinion, and a crank means operatively connecting said gear with the rigid wall.

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