Aug. 18, 1953 M. W. GUYER 2,648,986

PUMP DRIVE

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FIG. 1.

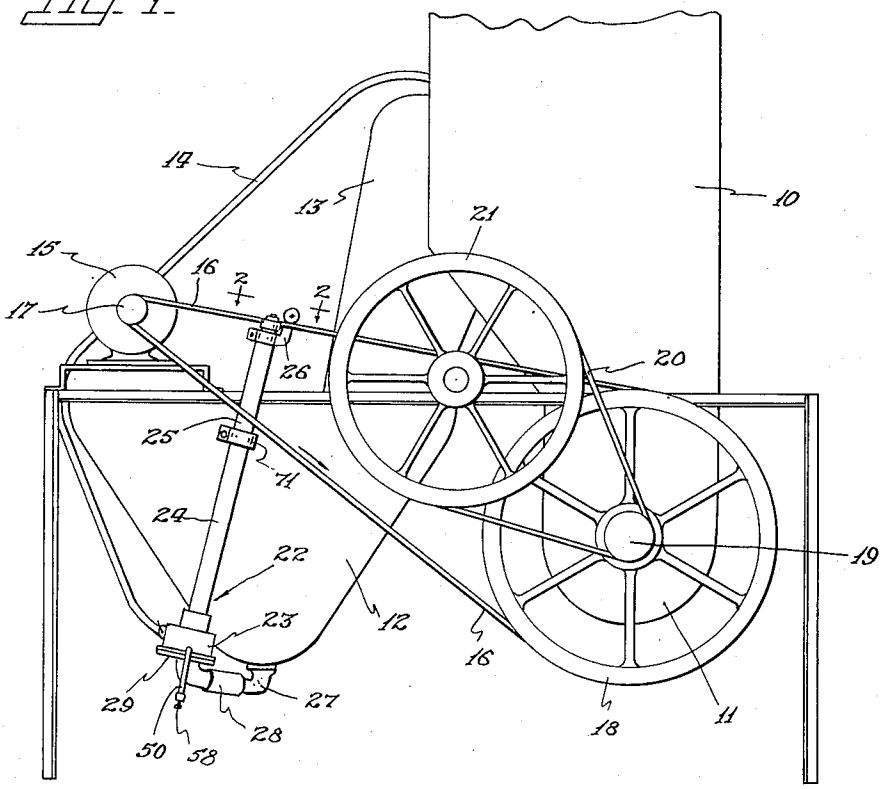
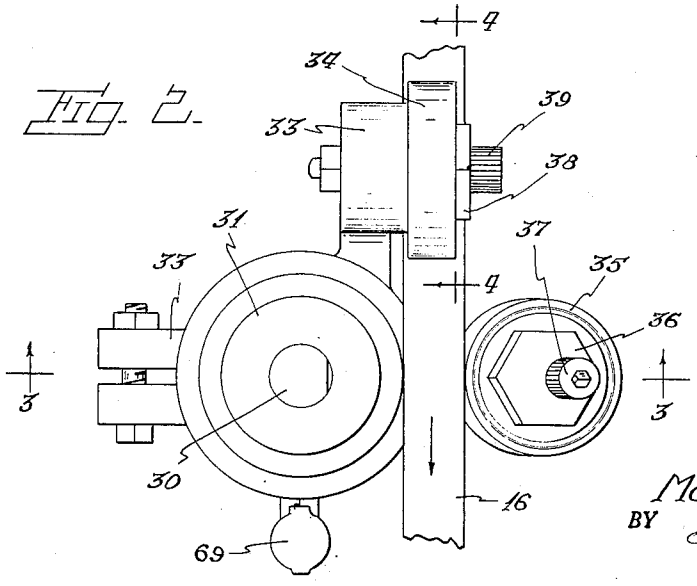


FIG. 2.



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PUMP DRIVE

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FIG. 3.

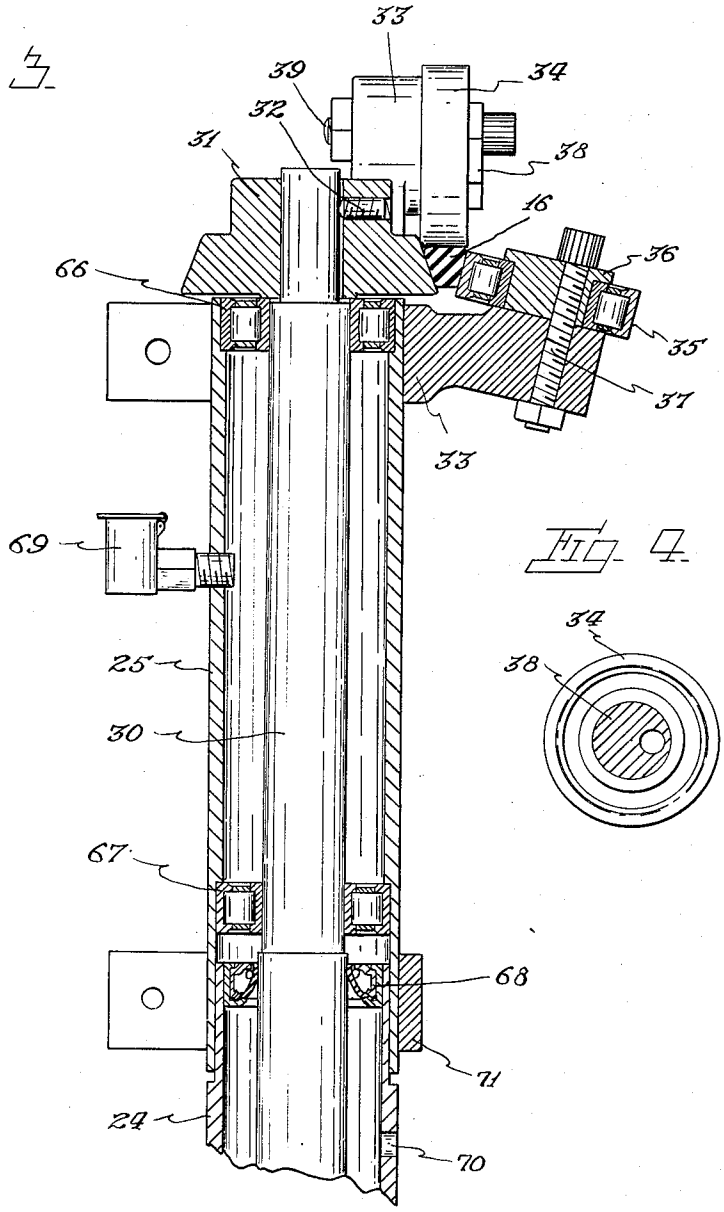


FIG. 4.

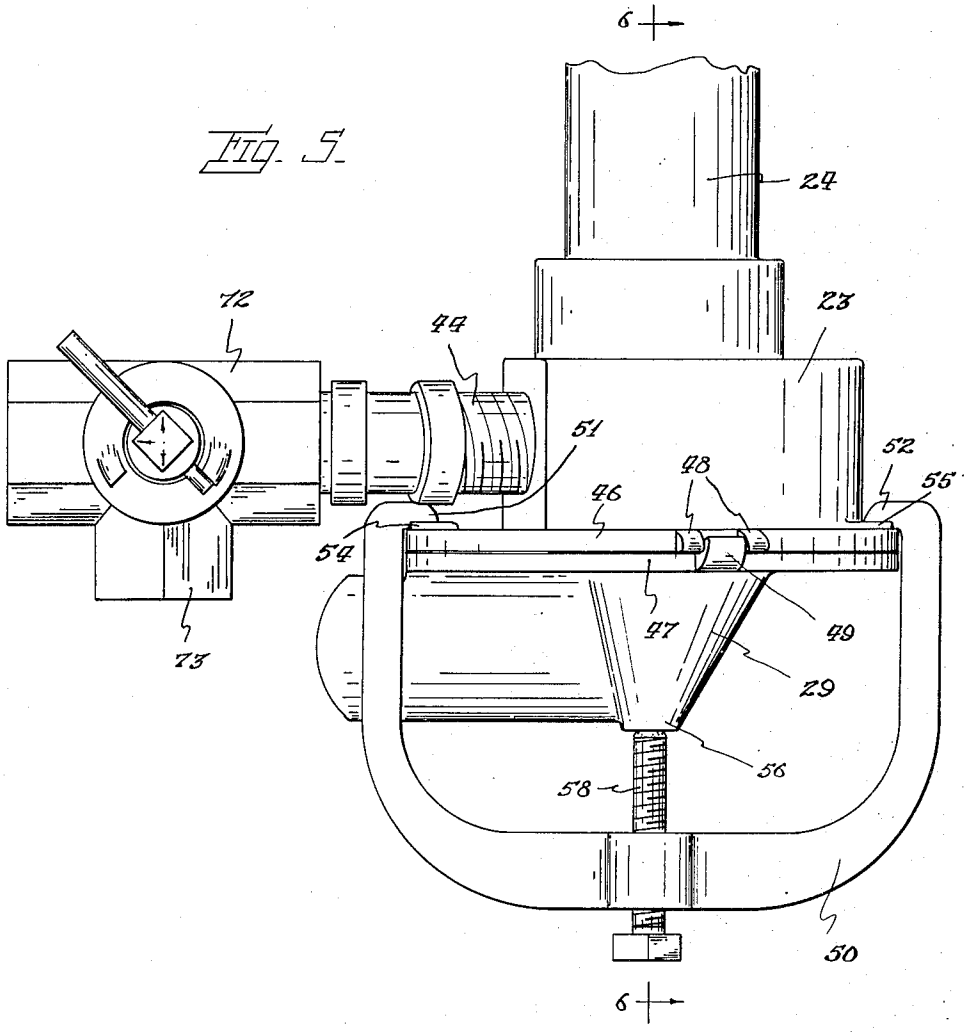
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Fig. 5.



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FIG. 6.

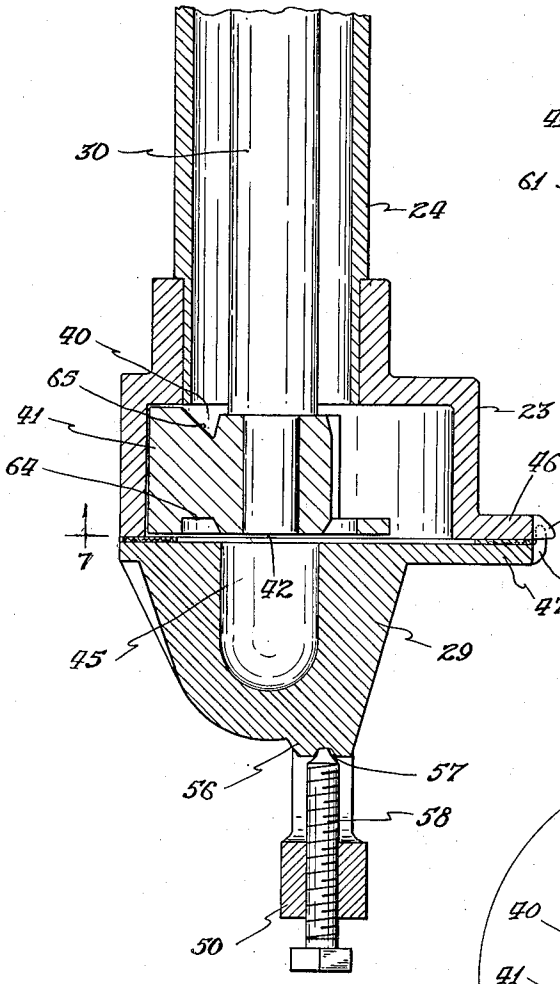


FIG. 8.

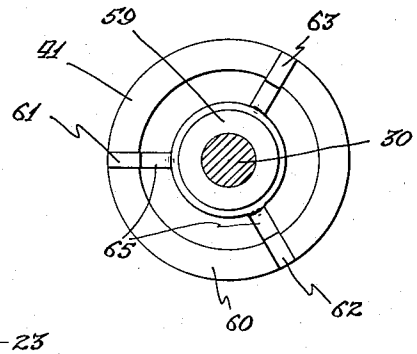
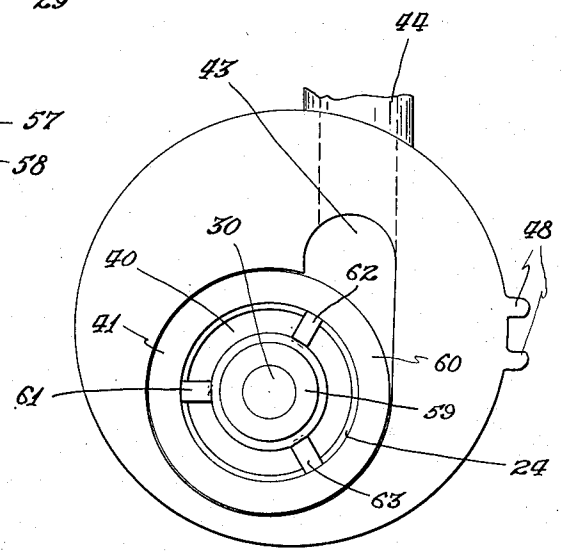


FIG. 7.



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UNITED STATES PATENT OFFICE

2,648,986

PUMP DRIVE

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Application June 13, 1949, Serial No. 98,834

3 Claims. (Cl. 74—221)

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The present invention relates to improvements in a pump drive.

It is the principal purpose of my invention to provide an improved pump and drive that is particularly useful in handling liquid suspensions of powdered materials that tend to settle out. One particular use of the pump is in connection with the treating of seeds. It is the practice now in many seed treatments to employ an active chemical in powdered form. The amount of chemical in proportion to the amount of seed is extremely small, so it becomes necessary to dilute the chemical with an inert powder that acts as a carrier to further distribution of the chemical. As a further means of preventing waste and injury to the health of the operators, the active chemical and inert powder is suspended in a liquid such as water or oil, to form what is termed a slurry.

In seed treating this slurry is agitated to maintain the suspension of the powders and is then measured out and discharged upon the seed and thoroughly mixed therewith to get as uniform distribution as possible. The powdered materials are often abrasive and are invariably difficult to maintain in suspension. The pump and drive mechanism of the present invention is particularly applicable to the handling of this type of product.

More particularly it is the purpose of my invention to provide a pump wherein the actual liquid moving parts of the pump are arranged in a housing which is easily opened and drained and the bearings and drive mechanism are so mounted as to be clear of the liquid at all times and not disturbed by the opening of the pump for removal of any accumulation of powdered material therein.

It is a further purpose of my invention to provide an improved drive mechanism in a pump of this character which enables the pump to be driven from any existing belt flight that is used in other parts of the machine to which the pump is attached.

A further purpose of the invention is to provide a novel pump construction wherein the interior of the pump is open to the atmosphere during operation even though the pump may have to raise the liquids so that it is working against a head pressure considerably above atmospheric pressure.

The nature and advantages of my invention will appear more fully from the following description and the accompanying drawings wherein a preferred embodiment of the invention is shown. It will be readily appreciated, however, that minor

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changes and improvements may be made in the construction without departing from the scope of the invention as defined by the claims.

In the drawings:

Figure 1 is an end view of a seed treating machine of the type referred to above, illustrating my improved pump in connection therewith;

Figure 2 is an enlarged fragmentary view taken on the line 2—2 of Figure 1 illustrating the drive mechanism of the pump;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2 showing the upper, or drive, end of the pump;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 2;

Figure 5 is a side view of the lower end of the pump;

Figure 6 is a sectional view taken on the line 6—6 of Figure 5;

Figure 7 is a bottom view looking up at Figure 6 on the line 7—7 of Figure 6 with the bottom closure removed; and

Figure 8 is a plan view of the pump impeller.

Referring now to Figure 1, my pump is shown in connection with a seed treating machine to illustrate one of the applications. However, it should be understood that the use of the pump is not limited to seed treating as it may be applied wherever the characteristics embodied in the pump are of advantage. The seed treating machine includes a seed hopper 10, a mixing trough 11, a slurry mixing tank 12, a slurry distributing means which is hidden by the hopper 10 in Figure 1 and a slurry overflow return 13 to the tank 12. A machine of this character is shown in my prior patent application, Serial Number 787,134, filed November 20, 1947, Patent No. 2,600,641 dated June 17, 1952.

In machines of this character the slurry is pumped from the bottom of the tank 12 through a hose 14 into the slurry distributor which embodies a measuring device. The flow of slurry to the distributor is continuous and any overflow from the measuring device is returned to the tank 12. A motor 15 operates a mixing screw in the mixing trough 11 by means of a V-belt 16 and pulleys 17 and 18. The stirring mechanism for the slurry in the tank 12 is driven by a pulley and belt take-off from the pulley 18. This take-off includes a pulley 19, a belt 20 and a pulley 21. These parts are merely described to explain the application of my improved pump 22 and its drive mechanism to a particular machine.

The pump 22 embodies a main pump housing 23,

tubular column members 24 and 25 and a drive mechanism 26 for taking power from a belt such as the belt 16. The outlet hose 14 is connected to the housing 23 and an outlet connection 27 from the tank 12 is connected by a flexible hose 28 to the bottom closure unit 29 of the pump 22.

Figures 2, 3 and 4 illustrate the upper end of pump and the drive mechanism. A shaft 30 is mounted in the tubular members 24 and 25 by bearings 66 and 67 and a sealing member 68. The bearings 66 and 67 are seated in a member 25, while the sealing member 68 is seated in the member 24. A grease cup 69 is provided in the member 25 to supply oil for the bearings 66 and 67. The member 24 has an aperture 70 therein close to the top thereof. The members 24 and 25 are telescoped at their meeting ends and clamped together by a clamp ring 71 to make a tight joint.

A drive wheel 31 is fixed on the reduced upper end of the shaft 30 by a set screw 32. The drive member 31 rests on the inner race of the bearing 66 and supports the shaft 30 at the proper level. A mounting bracket 33 is clamped to the top end of the member 25 and supports two rollers 34 and 35 which cooperate with the wheel 31 to cause the belt 16 to drive the wheel. As shown, the roller 35 is positioned to press the belt 16 against the wheel 31. The roller 35 is mounted by an eccentric hub 36 and a bolt 37 so that it can be adjusted toward and away from the wheel 31. For a given belt size this provides a means to vary the speed of the pump somewhat by changing the level of the belt on the tapered surface of the wheel. This construction also enables one to set the roller 35 and wheel 31 for different sizes of belts 16. The roller 34 is mounted by a like eccentric hub 38 and a bolt 39 so that it may be raised and lowered with respect to the wheel 31. It will be noted from Figure 2 that the roller 34 is off-set lengthwise of the belt 16 from the wheel 31 and is adjusted to press the belt 16 down into the passage between the wheel 31 and the roller 35 the necessary amount to provide the driving engagement between the belt 16 and the wheel 31.

The pump housing 23 is fixed on the lower end of the member 24 and has a recess 40 for a pump impeller 41 that is fitted on the lower end of the shaft 30 (see Figure 6). The shaft 30 holds the impeller 41 slightly above the open bottom face of the housing 23 as indicated by the space at 42 in Figure 6. The fluid outlet from the impeller 41 is through a channel 43 in the housing 23 to a pipe 44. The open lower face of the housing 23 is closed by the member 29 which has an inlet passage 45 opened centrally beneath the impeller 41.

As shown best by Figures 5, 6 and 7, the parts 23 and 29 are secured together in such a fashion that they may be readily separated to gain access to the interior of the pump. The parts have opposite flanges 46 and 47. The flange 46 has two locating ears 48 which receive an upturned ear 49 on the flange 47. A yoke 50 is provided with in-turned ends 51 and 52 to engage over the flange 46 of the housing 23. The flange 46 has seats at 54 and 55 for properly positioning the yoke. The member 29 has a downwardly facing boss 56 which is recessed at 57 to receive the upper end of a screw bolt 58 that is threaded into the yoke 50. It is evident that by turning the screw bolt 58 back, the yoke 50 can be lifted off the member 23 so that the member 29 drops down to open up the interior of the pump.

The pump impeller 41 is composed of a lower outer ring 60, a central hub 59 and a plurality of upstanding vanes 61, 62 and 63 arranged equidistant from each other. The vanes are notched as indicated at 64 and 65 in Figure 6.

The pipe 44 is connected to a three-way valve 72 which is coupled to the hose 14. The valve 72 has a drain outlet at 73. The hose 14 can be drained without opening the outlet of the pump. Also the valve connects the hose to the pump with the drain closed and can be set to drain both the pump and the hose.

It is believed to be evident from the foregoing description that I have provided a pump and drive mechanism wherein the pump itself can be submerged in and operated in the slurry with the drive mechanism and the bearing for the pump shaft entirely free from contact with the slurry. The pump and impeller construction operates to supply the slurry with the interior of the tubular member 24 above the pump impeller open to atmospheric pressure at all times. The opening 70 provides communication from the exterior to the space over the pump impeller. It is a peculiar characteristic of this construction that in operation the slurry is fed in through the inlet conduit 45 and discharged by centrifugal force through the passage 43 to the pipe 44. So long as the pump is operating the slurry does not build up in the tube 24. The inlet flow through the inlet opening 45 is somewhat restricted by the hub 59 of the pump impeller and the slurry which does enter the pump housing 23 is immediately driven by centrifugal force through the outlet channel 43. When the pump is stopped, there is a certain amount of slurry in the hose 14 which flows back and builds up somewhat into the tubular member 24 but the opening 70 is above the slurry level in the tank 12 so that the slurry does not escape through the opening 70.

From the foregoing description it is believed that the nature and advantages of my invention will be apparent to those skilled in the art.

Having thus described my invention, I claim:

1. Drive mechanism adapted to drive the shaft of a pump from a portion of a V-belt intermediate its supporting pulleys comprising a supporting column for said shaft, a bearing for said shaft in the upper end of said column, a drive wheel fixed on the shaft above the bearing, said drive wheel having a peripheral face for engaging a V-belt, a V-belt supported in tangential engagement with said peripheral face, a bracket on said column, a roller on said bracket having a peripheral face opposite the peripheral face of the drive wheel, the roller having its axis in a common plane with the axis of the drive wheel, the adjacent faces of the roller and the wheel in said plane being at substantially the same angle to each other as are the opposed driving faces of the V-belt to each other to urge the belt against said drive wheel, and a second roller on said bracket bearing on the outer surface of the belt to press it against the faces of the drive wheel and the first named roller.

2. Drive mechanism adapted to drive the shaft of a pump from a portion of a V-belt intermediate its supporting pulleys comprising a supporting column for said shaft, a bearing for said shaft in the upper end of said column, a drive wheel fixed on the shaft above the bearing, said drive wheel having a peripheral face for engaging a

V-belt, a V-belt supported in tangential engagement with said peripheral face, a bracket on said column and guide rollers mounted on said bracket, one of said rollers engaging the side of said belt most remote from the peripheral face of the wheel and the other roller riding on the outer surface of the belt to press the belt against the drive wheel.

3. Drive mechanism adapted to drive the shaft of a pump from a portion of a V-belt intermediate its supporting pulleys comprising a supporting column for said shaft, a bearing for said shaft in the upper end of said column, a drive wheel fixed on the shaft above the bearing, said drive wheel having a peripheral face for engaging a V-belt, a V-belt supported in tangential engagement with said peripheral face, and members carried by said column adjustable with respect to the drive wheel for guiding the belt into

driving engagement with the peripheral face of said wheel, said members comprising a roller on the opposite side of the belt from said wheel, an eccentric mounting said roller for adjustment toward and away from the wheel, and a second roller riding on the outer face of the belt in advance of the point of engagement of the belt with the wheel.

MORRIS W. GUYER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,072,650	Price	Sept. 9, 1913
1,074,794	Hunt	Oct. 7, 1913
1,361,958	Black	Dec. 14, 1920
1,883,266	Yoder	Oct. 18, 1932