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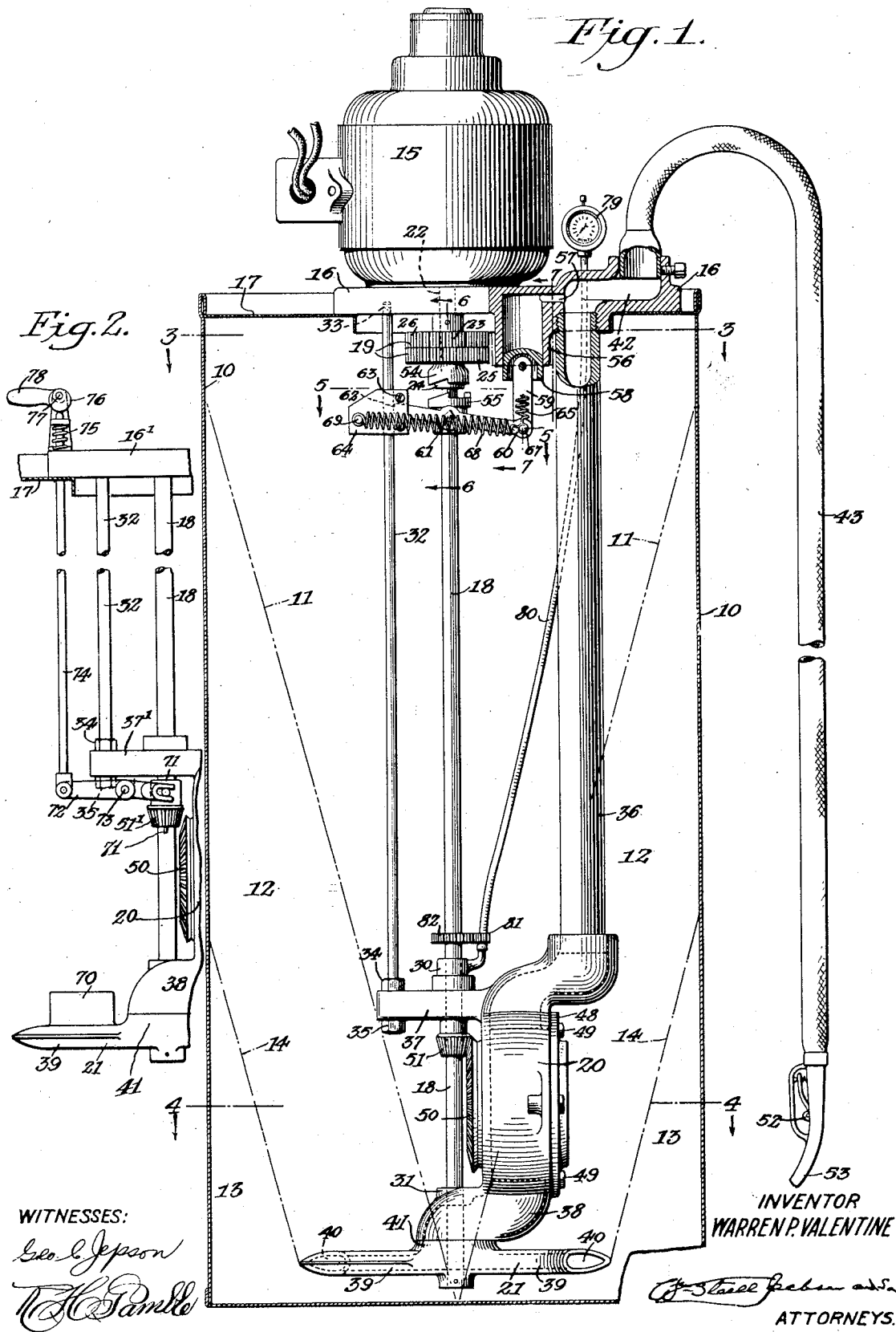
W. P. VALENTINE

1,930,294

PUMPING SYSTEM FOR GREASE

Filed Oct. 1, 1931

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Fig. 3.

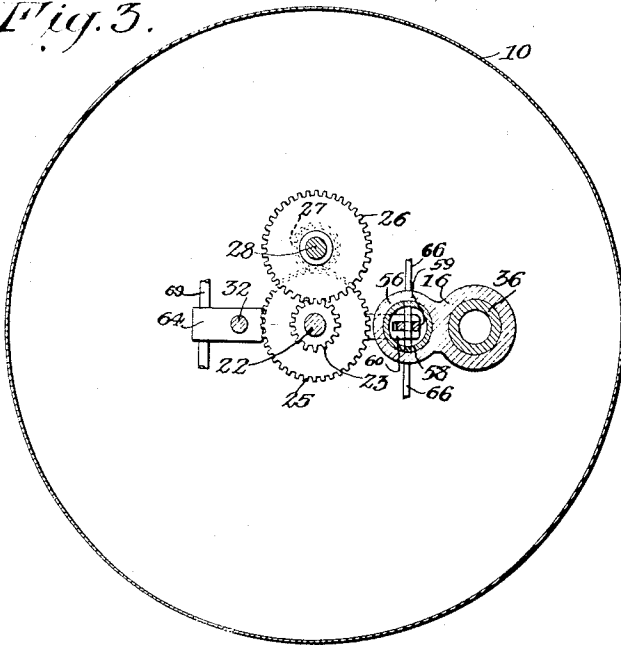


Fig. 4.

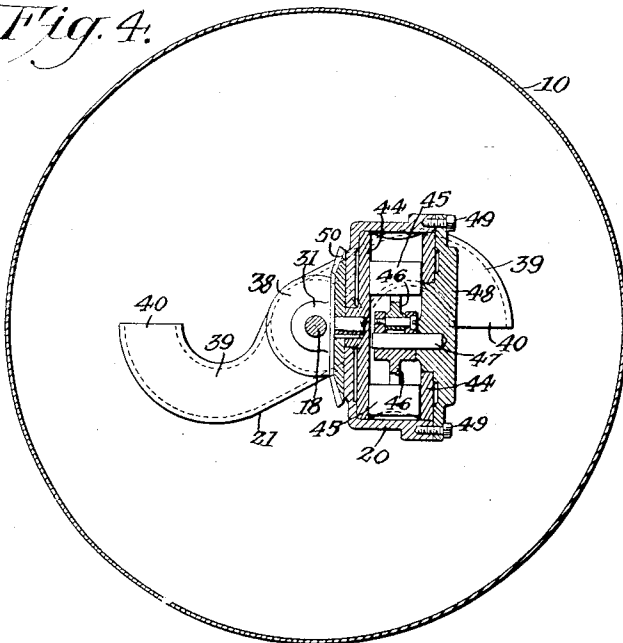
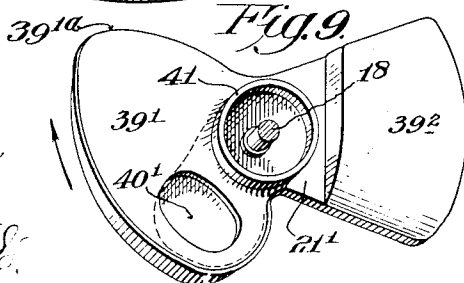


Fig. 5

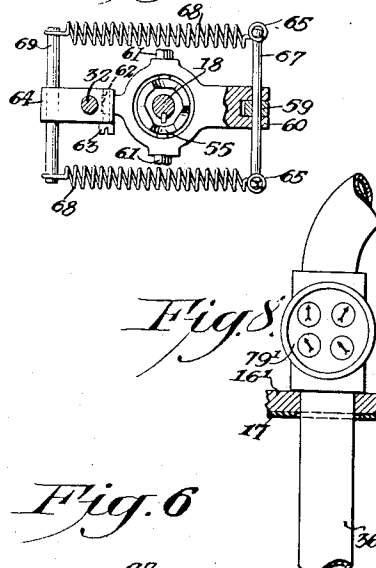


Fig. 6

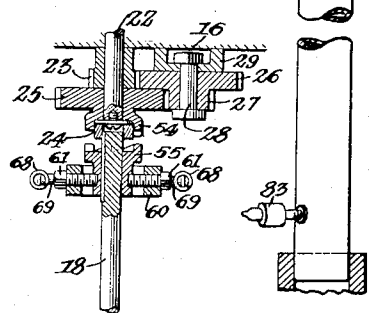
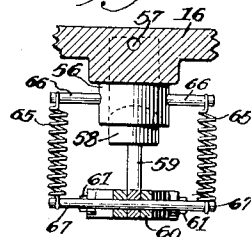


Fig. 7.



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Oct. 10, 1933.

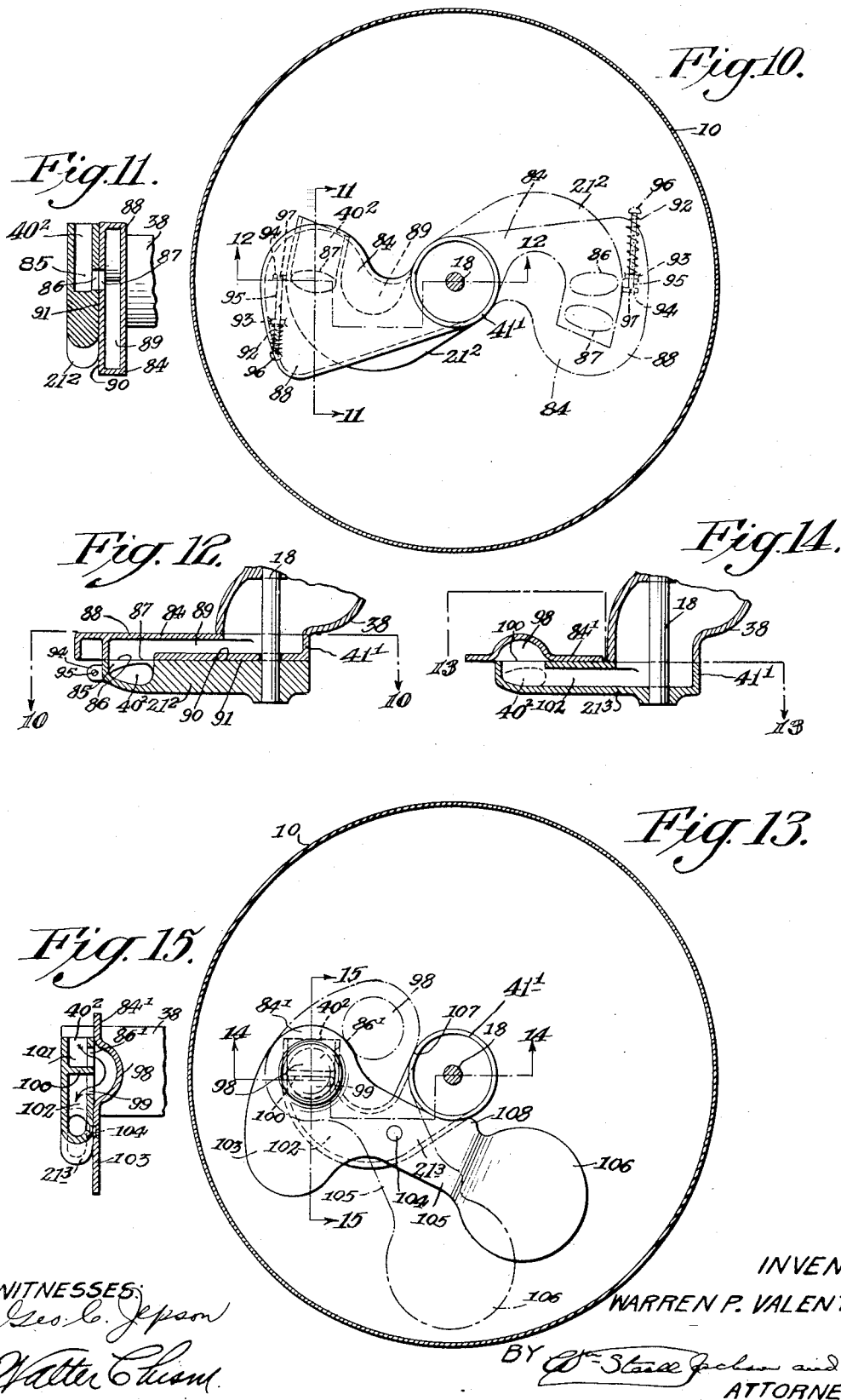
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

1,930,294

PUMPING SYSTEM FOR GREASE

Warren P. Valentine, Line Lexington, Pa., assignor to National Transit Pump & Machine Company, Oil City, Pa., a corporation of Pennsylvania

Application October 1, 1931. Serial No. 566,306

14 Claims. (Cl. 221—80)

My invention relates to pumping systems for the high pressure delivery of fluid of high viscosity, for example grease, heavy lubricant, paint and the like, herein conventionally called grease, from a can or other holder of such material to bearings or elsewhere.

One purpose of my invention is to provide structure of the character indicated adapted to easy and inexpensive manufacture and well suited to the needs of service.

A further purpose is to discharge the content of a grease or paint container as completely as possible.

A further purpose is to combine a rotary collector and stirrer at the bottom of a grease or paint container with a positive pump, preferably of rotary type, using the collector to deliver the grease or paint to the pump.

A further purpose is to close the inlet to a grease pump when the inlet ceases to be in contact with grease and would otherwise pump air, discriminating between air and grease by the variant retardations of moving parts, encountered in these different media, and preferably to close the inlet by resilient means when it is not in contact with grease.

A further purpose is to automatically limit the discharge pressure from a grease delivery system.

A further purpose is to combine my pumping system with a commercial container in which the grease is sold to the user, and to dispense the grease directly therefrom, removing the pumping system to a filled can when the first can becomes empty.

A further purpose is to use a rise of discharge pressure of grease delivered from pumping mechanism of the character indicated to disconnect the mechanism from a driving motor thereof.

A further purpose is to indicate the amount of grease delivered from a container therefor by mechanism of the character indicated.

It will be evident that the rotary collector greatly enlarges the bottom area of the body of grease removed, still further reducing the height of the shell of content left in the container and limiting this to a little about the lower edges.

It will be further evident that the positive pump should be protected against inlet elsewhere than through the inertia feed and that the feed through the latter may be cut off automatically to prevent feeding of air when the viscous material in the path of the inertia pump inlet has been removed.

Further purposes will appear in the specification and in the claims.

In the drawings I have shown one main form only of my invention and a few modifications thereof, selecting a main form and detail modifications thereof that are practical, effective, convenient and inexpensive, and which well illustrate the principles involved.

Figure 1 is a sectional elevation of a desirable embodiment of the invention, showing my improved pumping system combined with and assembled on a grease or paint drum.

Figure 2 is a broken side elevation corresponding to a portion of Figure 1 but showing a modification, the discharging content being more suitably grease in Figure 1 and paint in Figure 2.

Figures 3 and 4 are sectional plan views taken on the lines 3—3 and 4—4 respectively of Figure 1.

Figures 5, 6 and 7 are fragmentary sections of Figure 1 taken respectively on the lines 5—5, 6—6 and 7—7 thereof in the directions of the arrows.

Figure 8 is a fragment corresponding to a portion of Figure 1 but showing a detail modification.

Figure 9 is a perspective view of a modified form of collector.

Figures 10 and 13 are sections corresponding generally in subject matter but not in plane of section to Figure 4, and are taken at the plane of junction between the collector and the pipe 38, immediately above closure valves used on the inertia pump in modifications.

Figure 10 is a section taken upon the line 10—10 of Figure 12 and Figure 13 is a section taken upon the line 13—13 of Figure 14.

Figures 11 and 12 are fragmentary sections taken upon lines 11—11 and 12—12 respectively in Figure 10.

Figures 14 and 15 are fragmentary sections taken upon lines 14—14 and 15—15 respectively in Figure 13.

Like numerals refer to like parts in all figures.

Describing in illustration and not in limitation and referring to the drawings:—

In the prior art, grease or paint, typified by a grease to be forced for example into a transmission or differential casing or other gear casing, has been fed from a can 10 by a pump having an inlet near the bottom of the can.

Because the grease is very viscous it has been difficult to deliver in this way anywhere near the entire content of the can, a supply of the viscous lubricant to the pump having usually failed after the content has been withdrawn from a generally cone-shaped portion represented for exam-

ple as in Figure 1 by the inverted conical volume between the dotted lines 11.

The annular portion 12 outside the lines 11 may represent the residual grease hitherto not deliverable by the pump which is here assumed to have its inlet at the apex of the deliverable portion, that is where the lines 11 come together near the bottom of the can and at about the middle of the can.

One feature of my invention greatly reduces the grease or paint residuum within the drum or container when delivery of the pump fails in that the pump has ceased to receive the inlet material, whatever its character. This reduction may be, for example, that from the large annular volume 12 outside the lines 11 to a small annular volume 13 outside the lines 14, Figure 1.

In Figure 1 the grease or paint delivery mechanism includes a motor 15, a body casting 16 supported on the lid 17 of the can or drum 10, a main drive shaft 18 operatively connected through reduction gearing 19 to the motor, a positive preferably rotary pump 20, a collector 21 and stationary structure supporting the drive shaft, the pump and the collector from the body casting 16.

The motor 15 is rigidly fastened to the body casting 16, and the motor shaft 22 carries the first gear 23 (Figure 6) of the reduction train 19 and is in axial alinement with the main drive shaft 18, the upper end of the shaft 18 turning in a sleeve bearing 24 at the lower end of the motor shaft inside the downwardly directed hub of the last gear of the train 19, the last gear of the train in normal operation turning as a unit with the shaft 18.

Between the first gear 23 on the motor shaft 22 and the last gear 25, also on the motor shaft 22, are large and small gears 26 and 27 on the stub shaft 28 held in the bracket 29. The reduction train may of course vary widely in known manner.

The lower portion of the main drive shaft 18 has journal support at 30 and 31, the stationary supporting structure from the casting 16 including a bolt 32, fastened to the casting 16 at 33 and having nuts 34 and 35, a discharge pipe 36 of the pump, a bracket 37 from the casing or body of the pump and a pipe 38 between the collector and the pump.

The collector 21, suitably pinned to the lower end of the shaft 18, may comprise an integral hollow casting with hollow curved arms 39 balanced symmetrically on opposite sides of the shaft 18. These arms have their open inlet ends 40 directed forwardly and discharge into a central upwardly directed hollow hub 41 which surrounds the shaft 18 and registers at its outlet end with the downwardly directed inlet of the stationary pipe 38 leading to the pump.

Wherever the pump may be mounted, my purpose is to supply it with content by means of a rotating collector which shall have a gathering diameter extending across a very considerable portion of the interior of the casing or can. To permit this and to adapt the pump to withdraw as large a percentage of the content as possible, I mount the collector approximately at the central axis of the can.

The outer surfaces of the hollow arms 39 of the collector are so shaped as to guide outwardly, to the collecting inlets 40, any content which would otherwise tend to remain upon the bottom within the inner portion of the area occupied by the collector. As a result of this construction, practically all of the content which, as before,

flows toward the bottom at and near the center of the can, is diverted outwardly toward the ends of the arms 39 into the path of movement of their openings and a much smaller residuum is left which is represented as lying outside the dotted line 14.

The content which lies in line with the inlet openings 40 is taken up directly by rotation of the arms 39 and passes through the hollow passages in the arms to the pipe 38 through which it is guided to the pump 20. The pump forces the content up through the discharge pipe 36, and passage 42 in the body casting 16 to a flexible delivery hose 43.

The pump 20 is very desirably of rotary type constructed in any suitable manner. In the drawings I illustrate a pump having a rotor 44, carrying pistons 45 on piston rods 46 eccentrically pivoted in a stub shaft 47 secured to a removable side casing 48 by bolts 49. The rotor is turned by bevel gears 50 and 51 from the main drive shaft 18.

Preferably mechanism is provided to effect an automatic shut-down of the pump when the pressure in the discharge piping rises, as by reason of a closure of a valve 52 on a delivery nozzle 53 of the hose 43.

As illustrated a clutch connection is provided between the upper end of the shaft 18 and the last gear 25 of the reduction train 19 operatively connected to the motor, one member 54 of the clutch being rigidly and permanently connected with the last gear of the train, with the cooperating movable member 55 of the clutch being splined to the shaft 18 and controlled with respect to position by the discharge pressure within the pipe 36.

In the illustrated mechanism for operating the clutch connection between the shaft 18 and the reduction train 19, a downwardly directed cylinder 56 forming a rigid portion of the casting 16 has pressure connection at 57 into the discharge passage 42. A piston 58 within the cylinder 56 is operatively connected to the movable clutch element 55, making connection by means of a suitable connecting rod 59 with one end of a rocker 60 that surrounds the clutch element 55 and makes operative connection thereto at 61. The rocker 60 presents its suitably rounded other end at 62 against the side of the long bolt 32 in a socket formed by the space between vertically spaced screws 63 and the opposite sides of a bracket 64 clamped by the screws to the bolt 32.

The rocker 60 is spring pulled upwardly at its end near the piston by springs 65 stretched between stationary pins 66 extending from the opposite sides of the cylinder and the extended ends of the pin 67 that pivotally connects the connecting rod 59 with the rocker 60.

The rocker end at the pin 67 is also strongly pulled by springs 68 in a direction to press the clutch toward closure when already closed and toward an open position when already open, the springs 68 on opposite sides of the rocker being stretched between a pin 69, on the bracket 64 and the pivot pin 67 of the rocker end, the line of pull of the springs 68 being thus below or above the connection 61 between the rocker and clutch element when the clutch is respectively open or closed. In effect the springs 68 operate a full-stroke device.

In normal operation the clutch is held closed by the springs 65 and 68 until the discharge pressure transmitted to the cylinder 66 rises suffi-

ciently to force the piston downward against the pull of both sets of springs.

Before the clutch elements fully separate incident to high pressure transmitted to the cylinder, the lines of pull of the springs 68 pass below the operative connections at 61 between the rocker and clutch, the springs 68 then snapping the clutch open.

When the pressure within the cylinder is released, as by reason of opening the valve 52 to charge another bearing, the springs 65 snap the clutch to closure, causing an immediate resumption of operation of the collector and pump.

I fully recognize the possibilities of adding fins or blades 70 to the collector 21, as shown in Figure 2, and using the same for mixing purposes. In such a use, the driving gear may be kept out of mesh with the gear 50 of the pump until the mixing is completed, to be then brought into mesh and the mixed material pumped from the container in quantities as needed.

In Figure 2, the bevel gear 51' has a spline connection at 71 with the shaft 18 and is adapted to be positioned in or out of mesh with the gear 50 of the pump rotor by means of a suitable forked rocker 72 which is pivotally supported at 73 upon the stationary bracket 37' and angularly positioned by a vertical link 74.

The upper end of the link 74 slides in a vertical opening through the body casting 16', and is spring-pressed upwardly at 75 into continuous engagement with a cam 76. The cam 76 is horizontally pivoted at 77 and angularly positioned by a suitable handle 78 to move the gear 51' into or out of mesh with the gear 50 of the pump.

I further provide an indicator 79 to determine the amount of grease pumped from the container by the rotations of the rotary pump.

The indicator 79 may be of any known revolution-counting type connected so as to show the rotations of the pump, the indicator scale being selected to show the delivered volume of grease.

In Figure 1 the indicator is shown as connected like a speedometer on an automobile by a flexible shaft inside a flexible casing 80 to a gear 81 meshing with a gear 82 on the shaft 18.

In the modification of Figure 8 I illustrate that the discharge from the rotor pump may be provided with a meter wholly separate from the pump and shown conventionally at 79' as mounted upon the body casting 16'.

This arrangement avoids the need for counting the rotations of the pump, which permits the use of a pressure relief valve 83 upon the discharge side of the pump—for automatically returning grease passing the pump back to the container when the discharge pressure increases, as by reason of closing a discharge outlet valve 52 upon the flexible connection 43.

When the discharge pipe 36 is provided with a high pressure relief valve, as at 83, adapted to discharge under high pressure back to the interior of the container, any automatic high pressure shut down of the pump is unnecessary. Usually the meter element should be beyond any by-pass discharge back to the container, for which reason the separate meter element of Figure 8 is desirable when the connections beyond the pump include a high pressure relief valve.

In Figure 9 I show a collector 21' having arms 39' and 39², and a hub 41. The inlet opening 40' is placed well back from the front of the arm 39', at a relatively thick point on the arm, so that the narrow front face 39² of the arm

39' will cut the lubricant content in the can and feed it into the inlet opening 40'. The arm 39² serves to balance the collector.

This form of collector is particularly desirable for use in extremely viscous materials, such as greases in cold weather, since the wedge shape of the collector reduces the resistance to rotation and assists in parting the grease.

It will be evident that the impeller feeding mechanism or collector at the bottom performs two main functions. It not only utilizes the inertia of the grease or other heavy or viscous material handled to cause movement of the content into the pump inlet to supply the pump, but at the same time it centrifugally, and by reason of its wedge shape, distributes the grease inside of the inlet openings out into the path of the inlet openings.

The inherent character of its operation makes the collector essentially an inertia pump as distinguished from the positive pump to which it acts as a feed.

The relation of the two pumps makes it highly desirable that the inertia pump part of the combination shall be over-size as compared with the positive pump, so that the positive pump will not lack content upon which to operate.

In the form of Figures 10, 11 and 12, a shut-off valve 84 is inserted between a single blade collector 21² and the lower part of the inlet for the positive pump. The collector 21² here does not require an extended passage, but is provided with a front inlet opening 40² and short connecting passage 85, which is laterally open at 86, so as to connect in the position shown in Figures 11 and 12 with a downwardly directed opening 87 of an arm 88, which opening communicates with the inlet to the positive pump by a passage 89 through the arm 88, and then through the hub 41'. The shut-off valve 84 is pivoted about the same shaft 18 which pivots the collector 21², but is free to turn on the shaft 18, while the collector 21² is rigid on the shaft 18. The valve 84 is provided with an under surface 90 in the same plane with the downwardly facing opening 87, which by movement of the parts closes the upwardly directed opening 86, shutting off its passage, and at the same time uses the upwardly facing surface 91 of the collector to close off the downwardly facing opening 87, preventing admission of air to the passage 89 and to the pump inlet pipe 38.

The valve member 84 is carried by the collector 21², but has sufficient relative movement with respect to it to perform the two functions of providing passage for the viscous material pumped in the position shown in solid line at the left in Figure 10 and of closing not only the passage through the collector 21², but more particularly the entrance 87 to the passage 89 in the position of the parts seen in dotted lines at the right in Figure 10.

The two parts are spring-pressed toward the position shown at the right of Figure 10, the closure position, by a spring 92 which is inserted effectively between lugs 93 and 94 upon the valve member and collector respectively, the spring being supported by a pin 95 whose head 96 limits outward movement of the spring.

As shown, the pin is carried by the collector and the lug 93 upon the valve is pressed toward the lug 94 upon the collector by the expansive force of the spring. The pin is free to turn in the plane of the paper to accommodate the vary-

ing angular positions by a pivotal connection at 97.

In operation during the presence of viscous material within the sweep of the valve element, the retardation of the viscous material against the forward part of the valve member pushes it back, compressing the spring and bringing the opening in the valve member into line with the upwardly directed opening in the collector. This position of the parts is maintained until the pumping becomes sufficiently complete, so that the valve member is no longer seriously retarded, at which time the spring expands, moving the valve member forwardly with respect to the collector and shutting off the flow of viscous material through the valve.

This is quite desirable in that it prevents pumping of air to the positive pump, and hence prevents pumping of air through the positive pump, with its danger of improper actuation of the meter and introduction of air into the grease line.

In Figures 13, 14 and 15 the collector 21³ and valve member 84' differ from those in Figures 10, 11 and 12 in two important particulars. The one is that the valve member 84' does not contain a channel, but has a cupped opening, merely, at 98, which in the position for feeding viscous material overlies a lateral (upward) opening 86' in the collector and also a second lateral opening 99 separated from the opening 86' by a barrier 100, which interrupts the passage of viscous material through the channel within the collector. The barrier separates the parts of the channel 101 connected with the inlet opening 40² from the rest of the channel 102 leading to the intake of the positive pump. With this arrangement no care need be taken to close the entrance to the valve member in the closure position, and all that is required is that the opening 99 shall be closed by the portion 103 of the valve member 84'.

There is another considerable difference between the two forms in that the form of Figures 13 to 15, instead of being pivoted about the same axis as the axis of the collector, and being spring-drawn to position, is pivoted at some point 104 along the length of the collector and is provided with an arm 105, and counterweight 106, which pass the axis of the collector and by centrifugal force tend to shift the valve member 84' to a position closing the lateral openings of the carrier.

The action of the centrifugal force on the arm 105 and counterweight 106 as compared with the arm carrying the valve member, on the other side of the center 104, is sufficient to close the valve at all times when the collector is rotating in air, but is overcome by the pressure of viscous material against the end of the valve member 84' and against the surface 106 of the counterweight end where viscous material is being pumped. In the absence of retardation by viscous material the centrifugal force of the counterbalancing end at 106 overcomes the pressure component upon these parts, with the result that the valve moves to closed position.

The body of the collector or the intake to the positive pump may be used as a stop-surface to limit the swinging movement of the valve member with respect to the collector. I show stops of this character at 107 and 108.

It will be evident that the inertia feed to the main pump may be closed by any other type of automatic valve which has a slight movement with respect to the arm of the inertia pump and which is drawn to one limit of its movement by

the additional retardation of one end against movement in the material gathered.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain part or all of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

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

1. In a rotary pump for viscous materials, a pump body having a horizontal axis, a rotor therein, means for turning the rotor, walls forming an inlet passage to said pump terminating in an opening substantially at right angles to the axis of the rotor, a rotary inlet member for feeding material to said passage, said member having an axis of rotation in said opening offset from the rotor in a direction axially thereof, and approximately at right angles to the said opening and to the axis of the pump rotor and discharging into the pump inlet passage and hollow arms carried by said rotary inlet terminating in openings facing in the direction of arm travel and feeding inlet material to said pump.

2. In a pump for pumping viscous materials, a positive rotary pump having an inlet opening, a second pump including a hollow horizontal arm rotating about a vertical axis and having a forwardly presented inlet toward the outer end of the arm, and an outlet at the said axis, a conduit connection therefrom to the inlet of the positive pump, a discharge pipe from the rotary pump, a driving shaft in the said axis and for both pumps supporting the rotor for one of the pumps and gearing between the drive shaft and the other pump, the said axis of the second pump being horizontally offset from the first pump.

3. In a pump for pumping viscous material, a positive rotary pump having an inlet opening, a second pump including a hollow horizontally extending arm rotatable about a vertical axis and having an inlet toward its outer end and an outlet at the said axis, a conduit connection therefrom to the inlet of the positive pump and having greater capacity than the capacity of the rotary pump and shut-off means for the material pumped by the second pump movable with respect to the second pump, resiliently drawn to a position of closure and opened by engagement with the viscous material.

4. In a pump for pumping viscous material, a positive rotary pump having an inlet opening, a second pump including a hollow horizontally extending arm rotatable about a vertical axis and having an inlet toward its outer end and an outlet at the said axis, a conduit connection therefrom to the inlet of the rotary pump and shut-off means for the material pumped by the second pump movable with respect to the second pump, and centrifugal means tending to close the shut-off when the content has been pumped, opened by engagement with the viscous material.

5. In a pump for viscous material, a positive rotary pump having an inlet, an inertia pump adapted to supply viscous material to the inlet of the positive pump, and having a rotor, a drive shaft for the rotor of the inertia pump, connections from the shaft for driving the positive pump and means for interrupting the connections whereby the inertia pump may be driven without driving the positive pump.

6. An inertia pump rotor having a conduit arm and at the end of said arm an opening facing in the direction of movement of the arm, and having a side opening to the conduit at the surface of the arm, and means for turning the rotor, in combination with a shut-off valve for said surface opening movable with the arm and also with respect to it having inlet from the arm conduit in retarded position and a shut-off therefor in advanced position and restrained during movement within the viscous material by retarding pressure of the material against the shut-off to open it and resilient means for normally turning the shut-off to closure position.

7. An inertia pump rotor having a conduit arm and at the terminal of said arm an opening facing in the direction of movement of the arm and having a side opening to the conduit at the surface of the arm and driving means therefor in combination with a movable shut-off valve for said opening supported upon said arm, having inlet from the arm conduit in one position and a shut-off therefor in another position, restrained during movement within the viscous material by retarding pressure of the material against the shut-off to open it and resilient means for normally turning the shut-off to closure position.

8. An inertia pump rotor having a conduit arm and at the terminal of said arm an opening facing in the direction of movement of the arm and having an opening to the conduit at an intermediate point at the surface of the arm and means for turning the rotor, in combination with a shut-off valve for said opening coaxial with the rotor having inlet from the arm conduit in one position and a shut-off therefor in another position, movable with the arm and restrained during movement within the viscous material by retarding pressure of the material against the shut-off to open it and resilient means for normally turning the shut-off to closure position.

9. A dispensing device for highly viscous material, a motor, a drive shaft connected therewith, a driven shaft, clutch mechanism between the drive shaft and the driven shaft, a collector for the viscous material mounted upon the driven shaft and having hollow arms at an angle to its radii adapted to feed the viscous material toward the outer ends of the arms, openings at the outer ends of the arms to collect the material and feed it through the hollow arms, a pipe connecting with said arms, a fluid pump connecting with the pipe, a connection between the driven shaft and the pump, a second pipe, a flexible hose connected with said second pipe at one end and having a valve nozzle at its opposite end, a cylinder connecting with the second pipe, a piston within the cylinder and a link motion connecting the piston with the clutch mechanism, whereby pressure built up within the second named pipe, the flexible hose and cylinder, will cause the piston to move the link motion to cause engagement or disengagement with the driven shaft.

10. In a pump for viscous materials, a positive pump element, a discharge pipe therefrom, a cylinder with which the discharge pipe connects and wherein the pressure of the discharge pipe is exerted, a piston in said cylinder, spring means for supporting the weight of said piston, driving means from the shaft for the positive pump, disconnecting means between the driving means and the shaft and full stroke means connected with the movable member of said disconnecting means,

whereby the excess pressure in the discharge connection from the positive pump opens the disconnecting means quickly and whereby the disconnecting means may be quickly and reliably fully thrown when the pressure in the discharge connection becomes excessive.

11. In a pump for pumping viscous material from a tank, a positive rotary pumping element having an inlet, an inertia rotary pumping element having openings facing in the direction of rotation of the rotor and having conduit connection with the inlet of the positive pumping element, a drive common to both elements, a discharge pipe from the positive pumping element, a cylinder connected therewith, a piston in said cylinder, a link for operating the piston, counterbalancing means for said link and piston, a lever connected to the link, a clutch operated by the lever, whereby the clutch is opened with excess pressure in the discharge pipe and full stroke means for moving the clutch when the excess pressure has started its movement.

12. In mechanism of the character indicated, a container for grease or paint, a collector adapted to rotate presenting a forwardly directed inlet near the bottom of the container and adapted to move by rotation of the collector about a path near the inside wall of the container and having an upwardly directed outlet, a pump having an inlet directly downwardly registering with the outlet of the collector, a shaft carrying the collector, an operative connection between the shaft and pump and shift mechanism for opening and closing the said connection and permitting the collector to be used as a stirrer without running the pump.

13. In mechanism of the character indicated, a container having a cover, a collector comprising tubular arms relatively in substantial balance with respect to a vertical axis of rotation, said arms having inlets at their outer ends presented forwardly in the plane of rotation and an upwardly directed common outlet surrounding the axis of rotation, a vertical shaft carrying the collector, a rotor pump having an inlet surrounding the shaft and in registry with the outlet of the collector, means mounted on the cover providing support for the shaft and for the pump, a motor mounted on the cover, a reduction gear connection between the motor and shaft, a clutch between the reduction gear and shaft and means controlled by the pressure of grease discharge from the pump for releasing the clutch under high pressure.

14. In mechanism of the character indicated, a container having a cover, a collector comprising tubular arms relatively balanced with respect to a vertical axis of rotation, said arms having inlets at their outer ends presented forwardly in the plane of rotation and a common outlet surrounding the axis of rotation, a vertical shaft carrying the collector, a rotor pump having an inlet surrounding the shaft and directed downwardly in registry with the outlet of the collector, means mounted on the cover providing support for the shaft and for the pump, a motor mounted on the cover, a reduction gear connection between the motor and shaft, and means for indicating the discharge of grease or paint from the pump and comprising a counter connected to show the revolutions of the shaft and a scale relating the said revolutions to the delivery from the pump.

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