

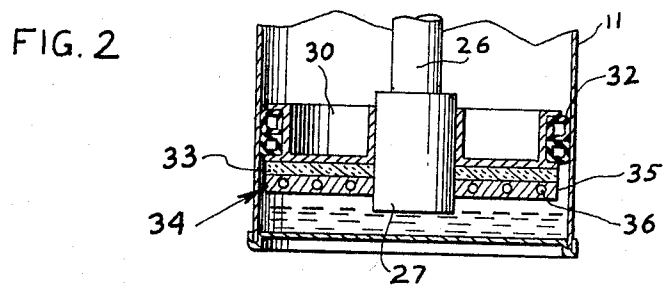
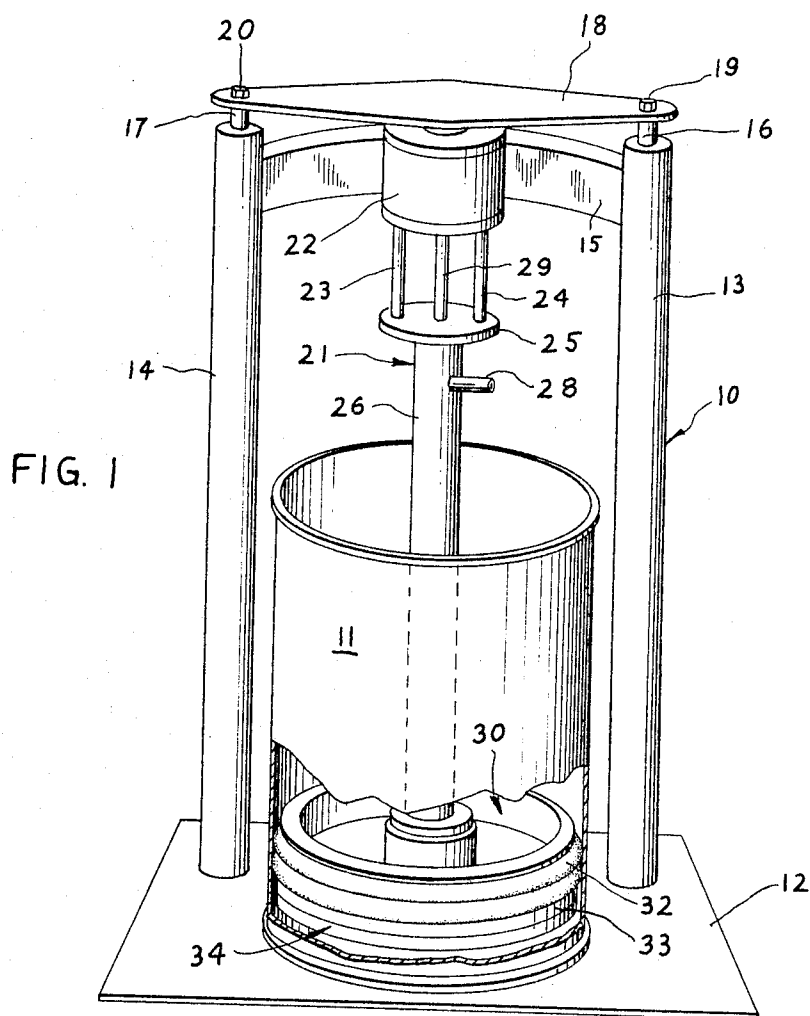
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HEATED DISPENSING APPARATUS

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HEATED DISPENSING APPARATUS
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This invention relates generally to apparatus for dispensing a material from a shipping container and, more particularly, to such apparatus having heating means associated therewith to lower the viscosity of the material being dispensed.

Although the present invention may be employed to dispense a wide assortment of materials, as will become evident hereinafter, one example of a material with which the present invention may be employed is lubricant. Lubricant is conventionally transported from the manufacturer to the user in a shipping container of convenient size. In order to minimize the amount of handling involved, the material is stored in, and directly used from, the shipping container. Apparatus, including a pump and associated equipment, is employed to remove the material from the container as it is being used. The container, and the material therein, may be subjected to extremely low temperatures while undergoing shipping or storage and, of course, the low temperature results in a marked increase in the viscosity of the material. This increased viscosity makes it very difficult, and often impossible, for a conventional pump apparatus to remove the material from the container. It would be possible to overcome this problem by storing the container in a heated atmosphere for an extended period immediately prior to use; however, this is obviously expensive and would often involve more time than is conveniently available. Care must also be exercised to avoid overheating the material, during storage or during dispensing, since some materials may lose essential physical or chemical characteristics if subjected to excessive heat or to an elevated temperature for a long period of time.

Accordingly, it is an object of this invention to provide an improved dispensing apparatus for the removal of a material from a shipping container.

It is another object of this invention to provide a dispensing apparatus having heating means associated therewith to facilitate the removal of a material from a container.

It is a further object of this invention to provide a heated dispensing apparatus to remove a material from its container which is so arranged as to minimize the possibility of overheating of the material.

Briefly stated, in accordance with one aspect of the invention, there is provided an apparatus for dispensing material from a container and which includes a stationary assembly and a movable assembly carried by the stationary assembly. The movable assembly includes a follower member adapted to enter the container through one end thereof and resilient wiping means are disposed about the follower member and adapted to engage the interior surface of the container. Heating means are carried by and below the follower member and both the heating means and the follower member each have an opening therethrough. Pump means are provided and include an inlet for the pump. The inlet extends through the openings in the follower member and the heating

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means to terminate at or below the lower surface of the heating means.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed that the invention will be better understood from the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a perspective view of the invention showing its employment with a shipping container wherein the shipping container is partially cut away to show details; and

FIGURE 2 is a partial sectional view showing details of the invention.

Referring now to the drawings and particularly to FIGURE 1, a heated dispensing means, shown generally at 10, is illustrated as it is being employed to dispense material from a shipping container 11. Dispensing means 10 includes a bottom plate 12 which is adapted to set upon a floor and which is further adapted to receive shipping container 11 thereupon. Extending upwardly from, and rigidly secured to, bottom plate 12 are a pair of uprights 13 and 14 which are interconnected by means of a rigid brace 15. Plate 12, uprights 13 and 14, and rigid brace 15 are all suitably secured together to form a rigid stationary assembly.

Extending beyond the top of each of uprights 13 and 14 are rods 16 and 17. A carrier member 18 extends between rods 16 and 17 and is secured to rod 16 by such suitable means as a threaded screw fastener 19 and to rod 17 by means of a similar fastener 20. Power drive means are provided within either or both of uprights 13 and 14 whereby rods 16 and 17 and carrier member 18 may be moved upwardly from the position shown in FIGURE 1. The power drive means may be of any suitable nature. For example, either or both of uprights 13 and 14 may actually comprise a pneumatic cylinder with a suitable piston secured to rods 16 and 17 disposed within each of the uprights. With such an arrangement, air pressure could be introduced into the uprights below the piston thereby forcing the rods and carrier member upwardly. Gravity could be used to return the arrangement to the position shown in FIGURE 1 or, a vacuum could be created below the pistons to draw the rods downwardly. Another example of suitable power means would be a reversible electric motor disposed within either or both of uprights 13 and 14 with a suitable gear arrangement to mechanically force rods 16 and 17 upwardly or downwardly as desired.

Secured to and carried below member 18 is a motor-pump assembly indicated generally at 21. Motor-pump assembly 21 includes a motor 22 which may be pneumatically or electrically powered. Motor 22 is rigidly secured to member 18 and extending downwardly from motor 22 are dowels 23 and 24. At the lower termination of dowels 23 and 24 a flange 25 is rigidly secured thereto. In other words, carrier member 18 supports motor 22 which in turn supports dowels 23 and 24 which in turn support flange 25. Flange 25 comprises the top wall of an elongated pump housing 26.

Housing 26 encloses suitable pumping means which will withdraw material from container 11 through an inlet 27 (FIGURE 2) and propel the material upwardly within housing 26 through an outlet 28 when the material being so pumped has a suitable viscosity. The exact type of

pump within housing 26 is not critical to the present invention. For example, it may be a reciprocating piston-type pump or it may be a rotary pump having a screw member disposed within the elongated housing 26. A rotatable, or reciprocating, shaft 29 interconnects motor 22 with the pump within housing 26 so that power is transmitted from the motor to the pump. Outlet 28 may be suitably interconnected to a receiving apparatus or the like by means of a conduit (not specifically shown).

Referring now to FIGURE 2, there can be seen a follower member 30 secured to the lower end of housing 26. Follower member 30 has secured thereto at its outer periphery, and projecting slightly beyond its outer periphery, resilient wiping means 32. Wiping means 32 are illustrated as pneumatically expanded tire-like annular elements which resiliently engage the inner surface of container 11 throughout its entire circumference. Resilient wiping means 32 assures that excessive amounts of the material being dispensed from container 11 will not remain on the interior surface of the container wall as the dispensing means progresses downwardly within the container, while at the same time assuring that the more rigid elements associated with the follower member 30 do not engage the wall of container 11.

The bottom surface of member 30 has a substantially flat configuration and secured thereto by suitable means is a layer of insulation 33. Disposed adjacent to and immediately below the insulation 33 is a heating means 34. Both heating means 34 and insulation 33, as well as member 30, have aligned openings through which extends the pump inlet 27. Insulation 33 and heating means 34 may be rigidly secured to either member 30 or pump housing 26 so that insulation 33 and heating means 34 move as a unit with follower member 30 and pump housing 26. Heating means 34 is illustrated as including a plate 35 having embedded therein an electrical resistance heating element 36. Although the illustrated arrangement is that presently preferred, it would be within the scope of the present invention to employ some other suitable form of heating means, for example, the electrical resistance heating means 36 may be carried directly by the insulation 33 with the plate 35 omitted. Similarly, one could employ a plate similar to plate 35 but having embedded therein steam or hot water conducting means.

It is important to note that the inlet 27 to the pump is illustrated as being below the lower surface of heating means 34. Although it is not necessary to have inlet 37 disposed well below the lower level of heating means 34, it is important that the inlet 27 not be disposed above the level of heating means 34 since to do so will necessitate the material being dispensed to liquify before it can be removed from container 11. With many materials this is exceedingly undesirable. Therefore, it is imperative that inlet 27 be positioned at or below the lower extremity of heating means 34.

It should be apparent at this point that rods 16 and 17, carrier member 18, motor 22, pump housing 26, follower member 30, and heating means 34 all combine to form a movable assembly carried by the afore-described stationary assembly.

To briefly summarize the operation of the above-described apparatus, the movable assembly is elevated to a height whereby container 11 may be placed under inlet 27. Once the container 11 is so positioned, the movable assembly is lowered until it contacts the material within container 11. At this point, heating means 34 and the pump are energized and as the heating means 34 lowers the viscosity of the material, the material enters inlet 27 and is propelled out through outlet 28 by the pump. This procedure may continue uninterrupted until container 11 is empty or, if desired, this procedure may be carried out in steps whereby only a portion of the material within container 11 is removed during each step.

As will be evident from the foregoing description, certain aspects of the invention are not limited to the par-

ticular details of construction of the example illustrated, and it is contemplated that various other modifications or applications will occur to those skilled in the art. It is therefore intended that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. Apparatus for dispensing material from a container comprising: a stationary assembly; a movable assembly carried by said stationary assembly; said movable assembly including a follower member adapted to enter the container through one end thereof; resilient wiping means disposed about said follower member and adapted to engage the interior surface of the container; heating means carried by and below said follower member; said follower member and said heating means each having an opening therethrough; and pump means having an inlet; said inlet extending through the openings in said follower member and said heating means and terminating no higher than the lower surface of said heating means.

2. Apparatus for dispensing material from a container comprising: a stationary assembly; a movable assembly carried by said stationary assembly; said movable assembly including a follower member adapted to enter the container through one end thereof; resilient wiping means disposed about said follower member and adapted to engage the interior surface of the container; heating means, including a flat circular plate having a diameter less than the diameter of said resilient wiping means, carried by and below said follower member; said follower member and said heating means each having an opening therethrough; and pump means having an inlet; said inlet extending through the openings in said follower member and said heating means and terminating no higher than the lower surface of said heating means.

3. Apparatus for dispensing material from a container comprising: a stationary assembly; a movable assembly carried by said stationary assembly; said movable assembly including a follower member adapted to enter the container through one end thereof; resilient wiping means disposed about said follower member and adapted to engage the interior surface of the container; heating means carried by and below said follower member; heat insulating means disposed between said heating means and said follower member; said follower member, said insulating means and said heating means each having an opening therethrough; and pump means having an inlet; said inlet extending through the openings in said follower member, said insulating means, and said heating means and terminating no higher than the lower surface of said heating means.

4. Apparatus for dispensing material from a container comprising: a stationary assembly; a movable assembly carried by said stationary assembly; said movable assembly including a follower member adapted to enter the container through one end thereof; resilient wiping means disposed about the follower member and adapted to engage the interior surface of said container; heating means, including a flat circular plate having a diameter less than the diameter of said resilient wiping means, carried by disposed between said heating means and said follower member; said follower member, said insulating means and said heating means each having an opening therethrough; and pump means having an inlet; said inlet extending through the openings in said follower member, said insulating means and said heating means and terminating no higher than the lower surface of said heating means.

5. Apparatus for dispensing material from a container comprising: a stationary assembly; a movable assembly carried by said stationary assembly; said movable assembly including a follower member adapted to enter the container through one end thereof; heating mean, including a flat circular plate having a diameter substantially equal to the diameter of said follower member, carried by and

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below said follower member; heat insulating means disposed between said heating means and said follower member; said follower member, said insulating means and said heating means each having an opening therethrough; and pump means having an inlet; said inlet extending through the openings in said follower member, said insulating means and said heating means and terminating below the lower surface of said heating means.

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