

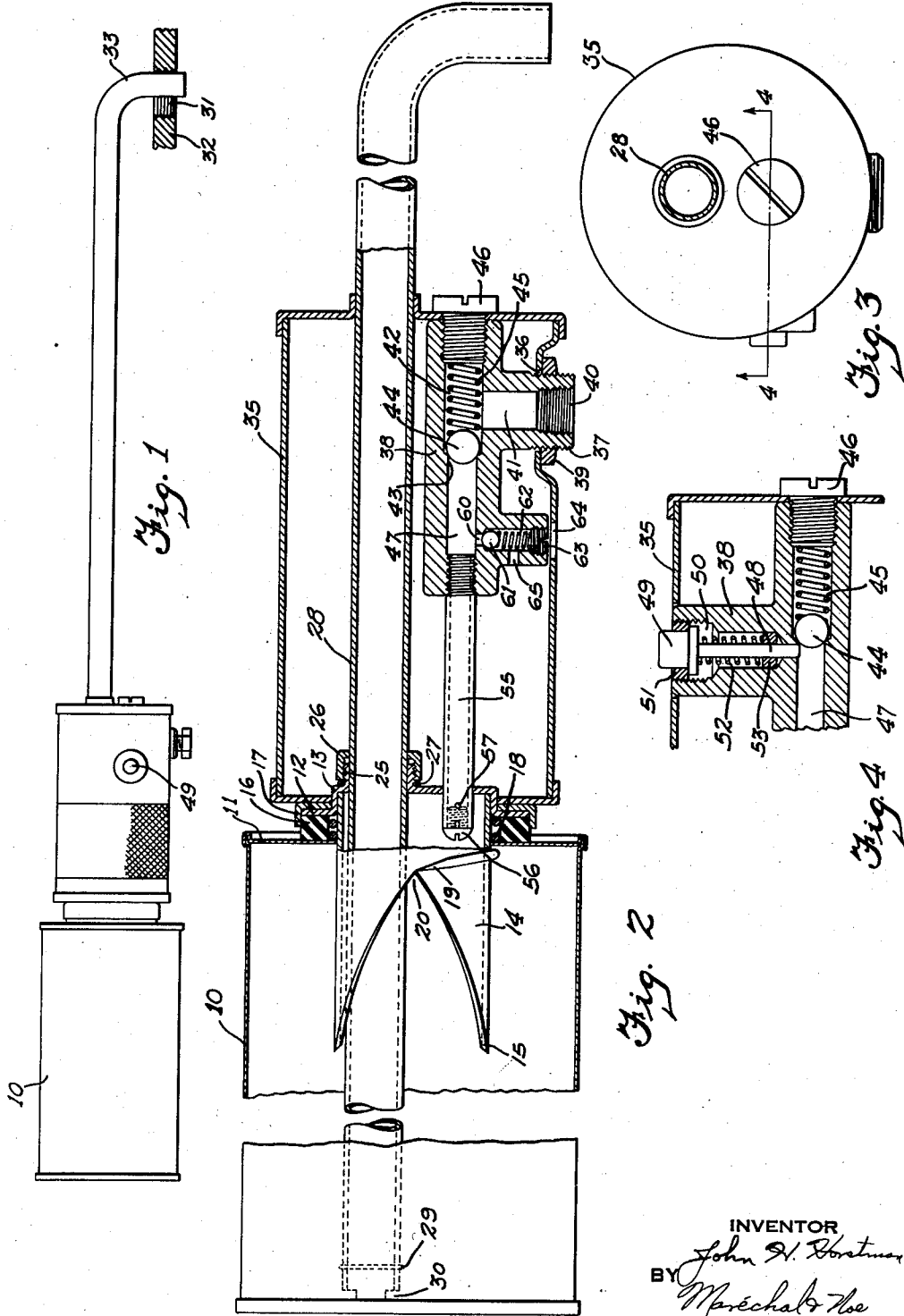
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DISPENSING DEVICE

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DISPENSING DEVICE

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1 Claim. (Cl. 221—47.3)

This invention relates to dispensing device.

It is the principal object of the invention to provide a dispensing device for the simple and effective dispensing of the contents of a sealed container through the use of an external source of air pressure.

It is a further object to provide a dispensing device for lubricants and the like adapted to utilize a source of air pressure such as is usually found in filling stations and the like under controlled conditions of operation to secure rapid, efficient and cleanly discharge of the contents of a sealed lubricant container.

It is a further object to provide such a device applicable to air pressure systems of varying pressures, and which embodies a safety control thereon to limit the application of the air pressure condition effective upon the container to a proper controlled value.

Other objects and advantages will be apparent from the description, the accompanying drawing, and the appended claim.

In the drawing,—

Fig. 1 is a view in elevation showing a device constructed in accordance with the present invention;

Fig. 2 is a broken longitudinal sectional view of the same;

Fig. 3 is an end elevational view of the device; and

Fig. 4 is a partial sectional view on the line 4—4 of Fig. 3.

Referring to the drawing which discloses a preferred embodiment of the invention there is shown at 10 a container, preferably formed of metal or paper material, the contents of which it is desired to discharge. For illustrative purposes, the invention will be hereafter described primarily with reference to the dispensing of lubricants from sealed containers, such as containers of one, two, three, and ten pound capacity, as utilized in filling stations and the like. The invention has been more particularly developed and utilized in the dispensing of heavy lubricants such as the hypoid lubricants used with hypoid gearing, however it is equally well adapted for dispensing liquids of greater or less viscosity.

Such container 10 embodies a cylindrical body wall and an end wall 11, of metal, which seals the contents of the container. In order to provide access to the interior of the container, the dispensing device is arranged to form an aperture in the end wall. For this purpose the device comprises a base plate member 12 formed

with an annular recess 13 into which are placed cutting means 14, generally circular in shape. The cutting means is formed with a pair of elongated cutting points 15 to facilitate penetration into the metal end wall, the cutting action continuing to form a complete aperture of circular or other suitable form as the cutting means is pressed fully into the end wall.

In order to provide for sealing the device in place upon the end wall of the container, a flexible sealing member 16, of rubber or other suitable material and annular in shape is positioned upon the base plate 12, being held in place thereon by means of annular collar 17 soldered to plate 12. A spiral spring member 18 is fastened immediately adjacent the outer periphery of the cutting knives 14 and is formed with a downwardly projecting end portion 19 which terminates adjacent the throat 20 of the cutting knives 14. In such position, upon the rotation of the base plate 12 with respect to the container 10, carrying with it the spring 18 and the sealing member 16, the projection 19 is adapted to pass under the end wall of the container adjacent the cut-out aperture, and upon continued rotation to draw the wall tightly into sealing engagement with member 16, thereby forming a substantially fluid sealed joint around the periphery of the aperture. In commercial devices of this character the spring member 18 is made with such lead that approximately a three-quarters turn of the container suffices to securely lock the same in sealed operative position upon the device.

The plate 12 is formed with a threaded neck portion 25 which threadedly receives a sealing cap 26, which clamps into sealing engagement with a gasket member 27 forming a fluid sealed joint for the reception of a discharge tube 28. The construction just described provides for slidable movement of tube 28 through the plate 12 in fluid sealed relation, and being located within the periphery of the cutting means 14 it is adapted to slide into the interior of the container 10, adjacent the bottom thereof when the device is in operative position on the container. The discharge tube carries a ring 29 adjacent its pick-up end of such size as to prevent the tube being pulled through the collar 25, and it is likewise formed with cut-out portions 30 to assure an open pick-up end for the tube.

The tube is relatively elongated as shown in Fig. 1 to provide sufficient length to assure ready accessibility to the desired discharge position. For example in the provision of a lubricator for dispensing hypoid lubricants access is desired

to the opening 31 in the differential housing 32. To facilitate such access, the tube adjacent its discharge end is formed with a short elbow 33 which is adapted to be inserted into the opening 31 and held in operative relation against a wall of such opening with the container 10 conveniently held in the hand of the operator.

In order to provide for an expelling action upon the contents of the container, means are provided for making connection to a source of air pressure, such for instance as the usual air pressure line provided in filling stations and the like. This means includes a cylindrical casing member 35 having a recessed aperture 36 in one side thereof through which projects the threaded end 37 of an air connection device cast integrally as a part of valve body member 38. Nut 39 serves to clamp the connection in position upon the wall of the cylinder, and internal threads 40 are provided for receiving the external air connection. It will be understood that this connection is made suitable for receiving an air hose connection of any desired type, suitable adapters being used as required.

A passage 41 is formed through the end 37 into a valve chamber 42 formed in a member 38. The member 38 is provided with a portion of reduced diameter 43 forming a valve seat for the reception of a flat circular pilot check valve 44. Spring means 45 bears against valve 44 tending to urge it into sealing relation with its seat, the opening being closed in air tight manner by means of screw 46 which is provided with suitable sealing gasket. It will be understood that the air pressure supplied through passage 41 is effective upon the check valve to maintain it in closed position, and that discharge of the air into the passage at the outlet side of the valve, indicated at 47, is not permitted until the pilot valve has been raised from its seat. Control of the supply of air is provided for the operator by means of a valve operating member 48 which is provided with a head 49 extending to and accessible upon the outside of casing 35. Member 38 is formed with a passage 50 for receiving the operating plunger, and is recessed at 50 and internally threaded to receive a guiding cap 51 adjacent the exterior of the casing 35. Resilient means 52, acting against packing material 53 serves to normally urge the plunger out of contact with the check valve 44, to retain the valve in normal closed position. Upon manually depressing plunger 49, the valve stem 48 is caused to engage the pilot check valve 44, moving the same away from its seat, against the action of the air pressure and spring 45, thereby permitting air pressure to flow into the passage 47.

A tube 55 is threaded into the end of passage 47, and extends through plate 12 within the periphery of the cutting means 14 so that it is in communication with the interior of the container when the device is in assembled position thereon. Tube 55 is likewise threaded at its discharge end, and receives a screw 56 adjustably therein. An aperture 57 of controlled size is formed in tube 55, close to the end of screw 56. The aperture is of predetermined controlled size such as to limit and restrict the rate at which air can be supplied into the interior of the container. Thus it has been found that where air is supplied into the container at too rapid a rate, it has a tendency to mix or emulsify with the contents of the container, forming a mass of aerated bubbles or the like, which materially interferes with the proper discharge of the contents of the container.

Where however the rate of introduction of the air is limited as described herein, this tendency toward aeration is rendered non-objectionable, and proper discharge of the container contents is secured. For example in a device constructed in accordance with this invention for use with lubricants of the hypoid type, satisfactory results have been secured utilizing an aperture 57 having a diameter of .020".

It is ordinarily found that the air pressure systems used in filling stations and the like vary widely in their pressure characteristics, and generally are such as to create a pressure in excess of a proper value for practical dispensing operations. In accordance with the present invention safety means are provided for limiting the effective pressure which can be applied to the contents of the container, regardless of the conditions of the air pressure line to which the device is connected. This means includes a branch passage 60 formed in member 38, in communication with the passage 47, said passage having a seat for the reception of a ball valve 61, held in seating position thereon by means of spring 62. An adjusting screw 63, accessible from the exterior of casing 35 through aperture 64, provides for varying the pressure effective upon the ball, and thereby varying the pressure at which the valve will open. A discharge port 65 discharges to atmosphere, and this assembly thereby serves to open, and to permit discharge to atmosphere, upon the pressure in the passage 47 exceeding a predetermined value. Thus upon the depression of plunger 49 by the operator, air is supplied from the outside pressure source to the passage 47, tube 55, and through the limiting aperture 57 into and upon the contents of the container at a controlled rate. Should the applied air pressure be excessive so that a high pressure would tend to be built up in passage 47 in excess of a safe and proper value for application to the interior of the container the automatic valve 61 opens, releasing the excess pressure to atmosphere, and thereby effectively limiting the maximum pressure which is supplied into the container. This action takes place independently of the manual control of valve 49 by the operator, and functions to limit the maximum effective air pressure to a safe and controlled value.

In operation, as will be obvious, with the air pressure source available, the tube 28 is first drawn upwardly above the cutting knives, the device then placed in position over the end of the container, and the knives pushed therethrough to form the aperture. The container is then given a rotary movement with respect to the device, to effectively secure and seal the device upon the container. The tube elbow 33 is inserted into the opening 31 of the differential housing 32, or other place to which it is desired to discharge or dispense the lubricant and when pressed into position by holding the container, the tube is moved downwardly into position adjacent the bottom of the container. Upon manual depression of plunger 49, the air is thereupon supplied at a proper controlled pressure, and at a predetermined controlled rate, to the interior of the container, to be effective therein above the fluid contents for expelling the lubricant out through the discharge tube. The device can be conveniently held in place by manually urging the container 10 upwardly toward the lubricating opening 31, thereby pressing the short elbow 33 against the wall of the receiving device and maintaining the tube at the bottom of the container

to secure complete discharge of the contents of the container. Release of the control valve at any time serves to shut off the air supply and to terminate the dispensing operation.

5 While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without
10 departing from the scope of the invention which is defined in the appended claim.

What is claimed is:

A dispensing device of the character described adapted to discharge the contents of a container

which comprises cutting means for forming an aperture in the container, means for attaching the device in fluid sealed relation with respect to said aperture in the container, a discharge tube
5 slidably mounted with respect to said cutting means and movable into said container through said aperture, means forming a connection for a source of air pressure, manually operative means for controlling the application of said air pressure to said container to effect discharge of the
10 contents through said tube, and means for limiting the rate of application of said air pressure to said container.

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