

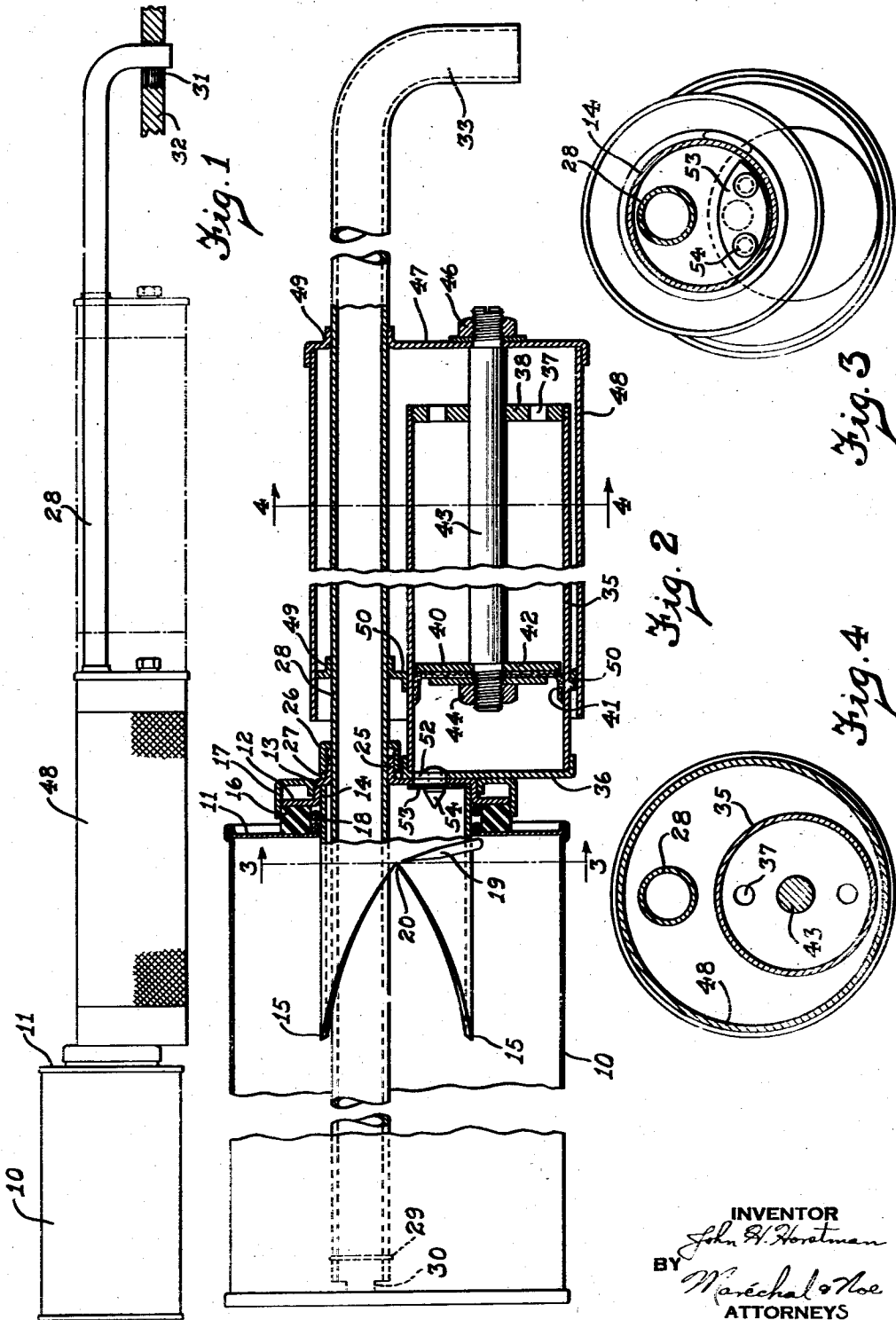
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J. H. HORSTMAN

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DISPENSING DEVICE

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INVENTOR
John H. Horstman
BY
Maréchal & Coe
ATTORNEYS

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DISPENSING DEVICE

John H. Horstman, Dayton, Ohio, assignor to The
Huffman Manufacturing Company, Dayton,
Ohio, a corporation of Ohio

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This invention relates to dispensing apparatus.

It is the principal object of the invention to provide a simple and effective dispensing device adapted for attached insertion into a container to be evacuated and having means operable thereupon effective to provide for quickly and completely dispensing material from a sealed container without leakage, discharging the same to a desired point of delivery.

It is a further object to provide a dispensing device adapted to form its own opening into the container to be evacuated and secured in dispensing connection in sealed relation therewith and to carry a pumping mechanism operable upon such device when in such sealing-mounted position upon the container whereby upon operation on such device to expel the contents from the container.

It is a further object to provide such a dispensing device particularly adapted for the rapid, efficient and cleanly dispensing of heavy lubricants, such as the special hypoid lubricants used with hypoid gears and the like.

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

In the drawing,—

Fig. 1 is a view showing the dispensing device in operative position on a container, and arranged to discharge the contents thereof to a desired point of delivery;

Fig. 2 is a broken horizontal sectional view of the device;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

The heavy oil or lubricant which is used in differential housings of automobiles, and commonly called hypoid lubricant, is quite heavy and viscous; and in present day auto construction the opening through which it must be introduced is not conveniently accessible. Also such lubricant is now frequently sold in sealed containers or cans. This invention provides a very satisfactory and readily handled apparatus for such purposes.

Referring to the drawing which discloses a preferred embodiment of the invention there is shown at 10 a container or can for the liquid, the contents of which it is desired to discharge. These cans usually are of one, two, three, and ten pound capacity, as utilized in filling stations and the like.

Such container 10 embodies a cylindrical body wall and an end wall 11, preferably 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 is 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 shown as soldered to plate 12. A spiral spring member 18 is fastened adjacent the outer periphery of the cutting knives 14 and is formed with a downwardly projecting end portion 19 which may terminate 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 cutout aperture, and upon continued rotation to draw the wall tightly into sealing engagement with member 16, and to hold the device connected to the can 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, and the spring thread adapts itself to irregularities in the top resulting from the cutting thus giving a light and operatively secure mounting of the device on the can.

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, and

to be extended to be 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.

Pump means are provided to create air pressure above the body of the material in the container to force its discharge through tube 28. This means comprises a pump cylinder 35, the end 36 of which is suitably fastened to the base plate 12 as by means of rivets 54. Suitable air intake openings 37 are formed in the opposite end 38 to permit ingress of the necessary air supply.

A pump plunger 40 is formed with a resilient cup member 41, of leather or other suitable material, held in place between cooperating disks 42, the assembly being bolted to the pump rod 43 by means of nut 44. It will be understood that upon movement of the pump rod to the right as shown in Fig. 2 air which has entered the pump cylinder above the plunger will flow around the cup 41 into the space beneath the plunger, the cup upon motion of the pump rod in the opposite direction providing for sealing against the wall of the cylinder and thus creating an expelling pressure in the pump cylinder.

The pump rod is secured by means of nut 45 to an operating handle 46. As shown the handle is made of a cylindrical inverted cup member of such diameter that it encloses not only the pump cylinder 35, but also includes the discharge tube 28, located non-axially but substantially parallel with respect to the pump cylinder, thus enclosing the pump parts, providing conjoint supports for the parallel pump cylinder and discharge tube. The cylinder 48 is provided with guide members 49 cooperating with and slidable along tube 28, and providing a strong and properly operative structure throughout the range of movement of the cylindrical device. Similar guide means 50 are provided to facilitate the guiding of the cylindrical device along pump cylinder 35. The end wall 36 of the pump, and likewise the base plate 12 are provided with aligned apertures 52, which are located radially inward of the cutting means 60, 14, and thereby in direct communication with the interior of the container when the device is in assembled position thereon. A flexible valve member 53, fastened in place over opening 52 by means of rivets 54 serves as an automatically operating valve for the pump cylinder, opening in response to a pressure stroke of the pump to supply air into the interior of the container, and automatically closing upon the return stroke of the pump to retain the built-up pressure within the container and to avoid leakage of the contents thereof into the pump cylinder.

In operation, the tube 28 is moved to its uppermost position with the tube end withdrawn beyond the cutting surface of the knives 14, the device then being placed over the end of the con-

tainer and the knives pressed through the end wall, cutting a substantially circular aperture therein. The device is then given a rotary motion with respect to the container sufficient to cause the spiral member 19 to engage under the wall of the aperture, and to draw the end wall 11 of the container tightly into sealing relation with the annular sealing member 16, thereby tightly sealing the device in place on the container and avoiding leakage of the contents during discharge, with resultant loss of the contents and objectionable uncleanly condition of the device, and also firmly connecting the device to the can so that they are held to operate as a unit during pumping.

With the device in sealed relation upon the container, tube 28 is then moved into its lowermost position with its pick-up end adjacent the bottom of the container; and the discharge elbow 33 is then placed in the opening to which it is desired to supply the contents of the container. For example, in the dispensing of hypoid lubricants into automobile differentials provided with hypoid gears, the lubricant is customarily packaged in one, two, three and ten pound containers, and the container including the desired quantity of material is thus arranged in cooperative position with the dispensing device. With the container held in one hand, or against the body of the operator and the elbow 33 inserted in the opening in the differential housing, the cylindrical operating member 48 is grasped with the other hand and given a reciprocating motion with respect to the cylinder 35. The container 10 and contents are thus held in stationary position during discharge and only the light operating member 48 and connected pump parts are reciprocated. With the discharge tube 28 firmly against the bottom of the container it will be caused to pick up and discharge the entire quantity of the contents. Upon operation an expelling pressure is developed, and the entire contents of the container are thereby rapidly, and efficiently discharged. The absence of leakage around the cut-out opening or aperture serves to avoid loss of the contents of the container and likewise prevents an untidy condition resulting upon the device itself. The firm connection between the device and the can and the form of cylindrical handle operating upon the spaced discharge tube and cylinder, with a plurality of sliding supports makes for a comparatively rigid and strong device and one which operates quite easily and effectively, and which is not subject to accidental disconnection of the device and can.

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 departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A dispensing device of the character described adapted to discharge the contents of a container which comprises cutting means for cutting an aperture into the wall of the container, sealing means for holding the device in fluid sealed relation with said container over said aperture, a discharge tube slidably mounted with respect to said cutting means and adapted to be moved through said aperture into the container adjacent the bottom thereof when the device is in operative position, a pump cylinder alongside the discharge tube, a reciprocable pump plunger, 75

a manual operating member for operating said pump plunger to create an expelling pressure upon the contents of the container, and guiding means slidable along said discharge tube for guiding said operating member during reciprocation thereof.

2. A dispensing device of the character described adapted to discharge the contents of the container which comprises cutting means for cutting an aperture into the wall of a container, sealing means for holding the device in fluid sealed relation with respect to the container, a discharge tube slidably mounted with respect to said cutting means and adapted to be moved through said device into the container adjacent the bottom thereof, a pump cylinder located eccentrically of said tube, a reciprocable pump plunger, and a manual operating member for operating said pump plunger freely slidable over and guided by said discharge tube.

3. A dispensing device of the character described adapted to discharge the contents of a container which comprises cutting means for cutting an aperture into the wall of a container, sealing means for holding the device in fluid sealed relation with respect to the container, a discharge tube slidably mounted with respect to said cutting means and adapted to be moved through said device into the container adjacent the bottom thereof, a pump cylinder substantially parallel with and spaced from said discharge tube, a reciprocable pump plunger, and a manual operating member for said pump plunger enclosing and slidable along said pump cylinder and said discharge tube.

4. A dispensing device of the character described adapted to discharge the contents of a container which comprises cutting means for cutting an aperture into a wall of the container, sealing means for holding the device in fluid sealed relation over said aperture, a discharge tube slidably mounted with respect to said cutting means and adapted to be moved into said container through said aperture formed by the cutting means, a pump cylinder, means for holding said pump cylinder in fixed and fluid sealed relation with respect to said container in assembled position of the device, a pump plunger, manual operating means for operating said pump plunger, and means positioned on said cylinder and cooperating with said discharge tube for guiding said manual operating member during operation thereof.

5. A dispensing device of the character described adapted to discharge the contents of a container which comprises cutting means for cutting an aperture into a wall of the container, sealing means for holding the device in fluid sealed relation over said aperture, a discharge tube slidably mounted with respect to said cutting means and movable into said container through said aperture, a pump cylinder alongside said tube, means for holding said pump cylinder in fixed position with respect to said container in assembled position of the device, a pump plunger, a manual operating member for said pump plunger enclosing said pump cylinder and said discharge tube, and connecting means between said pump plunger and said manual operating member.

6. A dispensing device of the character described adapted to discharge the contents of a container comprising a base plate, container cutting means carried by the plate to provide for forming an aperture in a sealed container, means

on said plate for connecting the device to the container in fluid sealed relation between the device and the wall of the container around the aperture, a discharge tube slidable through said plate and into the interior of the container following the formation of the aperture by said cutting means, a pump cylinder fastened to said plate eccentrically of said discharge tube, and a pump plunger reciprocable with respect to the cylinder.

7. A dispensing device of the character described adapted to discharge the contents of a sealed container comprising a base plate, container cutting means carried by the plate to provide for forming an aperture in said sealed container, means on said plate for connecting the device to the container in fluid sealed relation between the device and the wall of the container around the aperture, a discharge tube slidable through said plate and into the interior of the container following the formation of said aperture by said cutting means, a pump cylinder fastened to said plate eccentrically of said tube, a pump plunger reciprocable with respect to the cylinder, and means guided by said tube and said cylinder for effecting reciprocation of said pump plunger.

8. A dispensing device of the character described adapted to discharge the contents of a sealed container having an aperture provided therein comprising a base plate, means on said plate for establishing a fluid sealed relation between the device and the wall of the container around the aperture, a discharge tube slidable through said plate and into the interior of the container through said aperture, a pump cylinder fastened to said plate eccentrically of said tube, a pump plunger reciprocable with respect to the cylinder, and manually operable means enclosing and guided by said tube and said pump cylinder for effecting reciprocation of said pump plunger.

9. A dispensing device of the character described adapted to discharge the contents of a sealed container comprising a base plate, cutting means carried by said plate for forming an aperture in the wall of said sealed container, a discharge tube slidable through said plate inwardly of said cutting means and into the interior of said container through the aperture formed by said cutting means, a flexible sealing member located on said plate peripherally beyond the cutting means, a threaded member positioned for engagement with the edge of the aperture to effect clamping engagement of the wall of the aperture with said sealing means upon relative rotation therebetween, a pump cylinder supported on said base substantially parallel with and spaced from said discharge tube, a pump plunger, and manual operating means for operating said pump plunger to supply pressure to the interior of said container when said device is fastened to the wall thereof.

10. A dispensing device of the character described adapted to discharge the contents of a sealed container comprising a base plate, cutting means carried by said plate for forming an aperture in the wall of said sealed container, a discharge tube slidably mounted with respect to said plate and said cutting means and movable into the interior of said container through the aperture following formation thereof by said cutting means, a flexible sealing member located on said plate peripherally beyond the cutting means, a threaded member positioned intermediate said

sealing member and said cutting means adapted upon relative rotation between the plate and the container to enter beneath the wall of the container adjacent the aperture and to draw the
5 container wall into sealing relation with said sealing member, a pump cylinder supported on said base substantially parallel with and spaced from said discharge tube, a pump plunger, and
10 plunger to supply pressure to the interior of said container when said device is fastened to the wall thereof.

11. A dispensing device of the character described adapted to discharge the contents of a
15 container comprising means for securing the device in fluid sealed relation upon the container with respect to an aperture therethrough, a discharge tube slidable into said container through
20 said aperture, a pump cylinder held in fixed position with respect to said securing means and eccentrically of said tube, a reciprocable pump plunger operable in said cylinder, a manual operating member for operating said pump plunger
25 to create an expelling air pressure, valve means associated with said cylinder providing for the discharge of the compressed air into the interior

of the container and preventing back leakage of the contents thereof, and guide means on said tube and said cylinder for guiding the operating member during its reciprocating motion.

12. A dispensing device of the character described adapted to discharge the contents of a
5 container comprising means for securing the device in fluid sealed relation upon the container with respect to an aperture therethrough, an elongated discharge tube slidable through said
10 securing means in fluid sealed relation thereto and into the interior of the container, said tube having an elbow upon the discharge end thereof to provide for pushing against the wall of a
15 discharge opening to force the tube adjacent the bottom of the container, and pump means for creating an expelling air pressure above the contents of the container, said pump means including
20 a pump cylinder fixedly mounted with respect to said securing means and offset with respect to said tube, a reciprocable pump plunger, and manual operating means for said pump
25 plunger enclosing said cylinder and the elongated part of said tube and guided thereby.

JOHN H. HORSTMAN.