Jan. 11, 1938. R. E. HULME 2,105,039

METHOD AND APPARATUS FOR DISPENSING GREASE, OIL, AND THE LIKE, AND CAN THEREFOR

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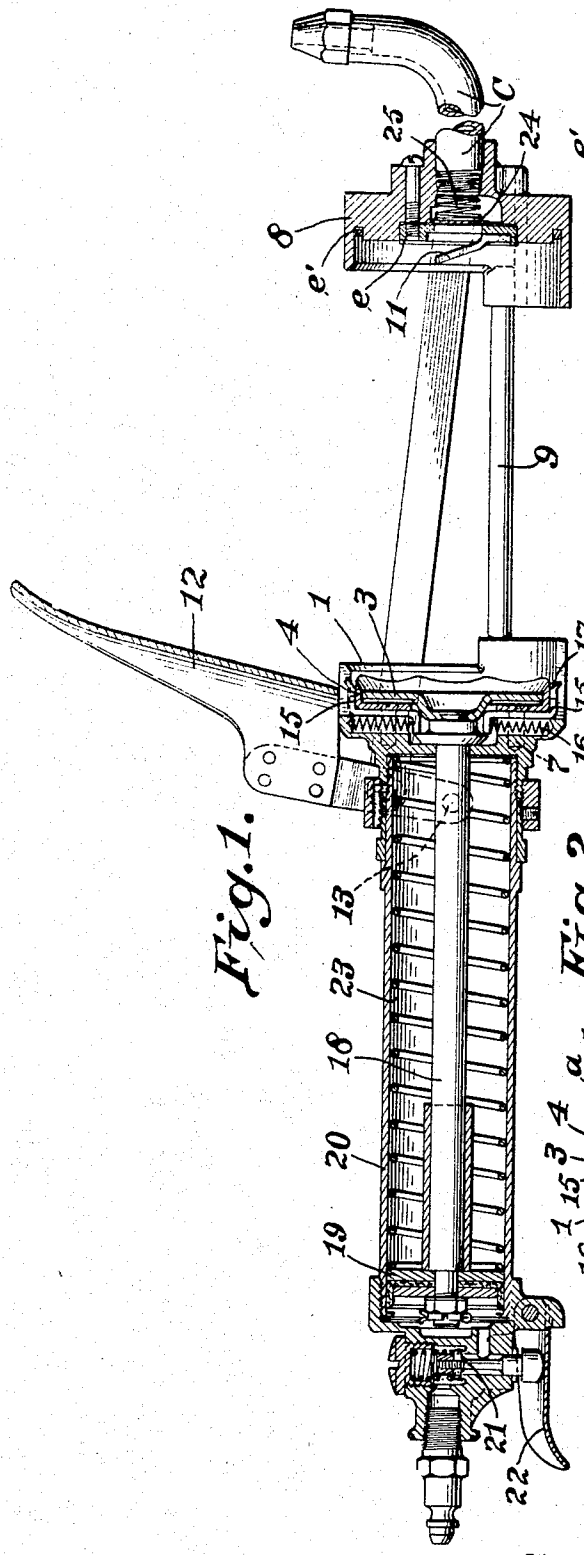


Fig. 1.

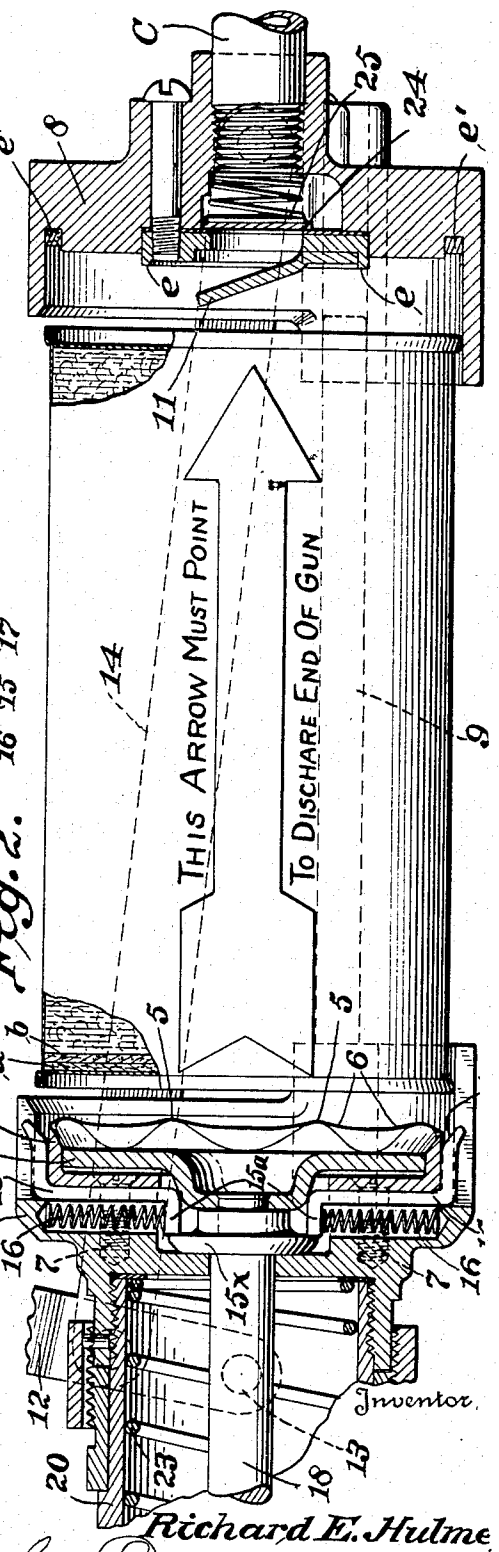


Fig. 2.

Inventor,

Richard E. Hulme

By Spear, Davidson & Hall

Attorneys

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Fig. 3.

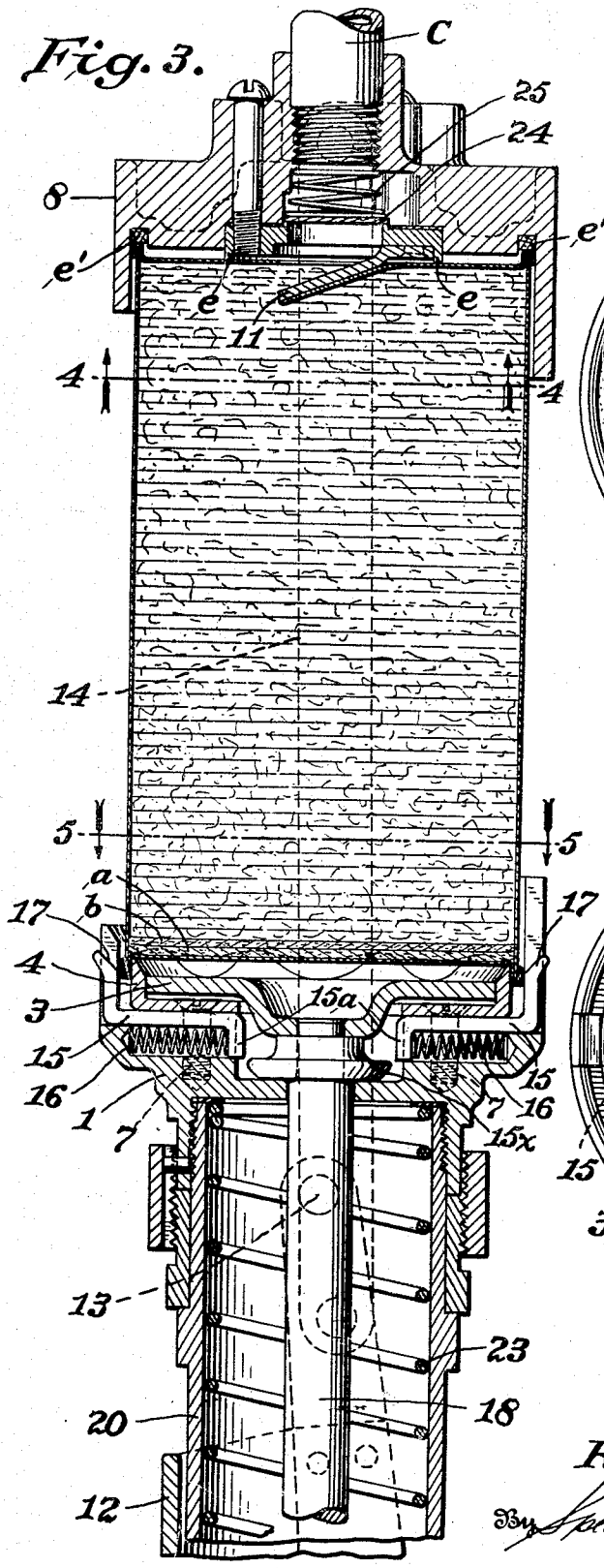


Fig. 4.

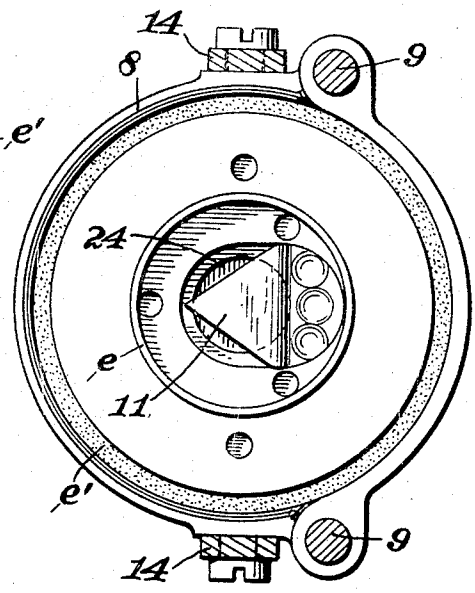
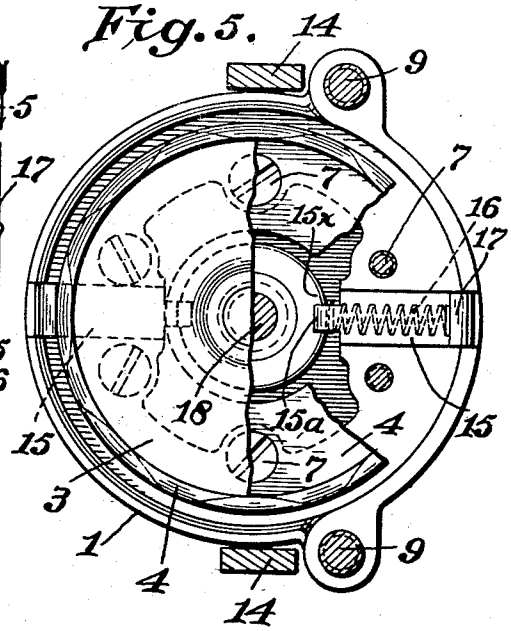


Fig. 5.



Inventor:

Richard E. Hulme,

By Spear, Dwarkam & Hall

Attorneys.

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Fig. 6.

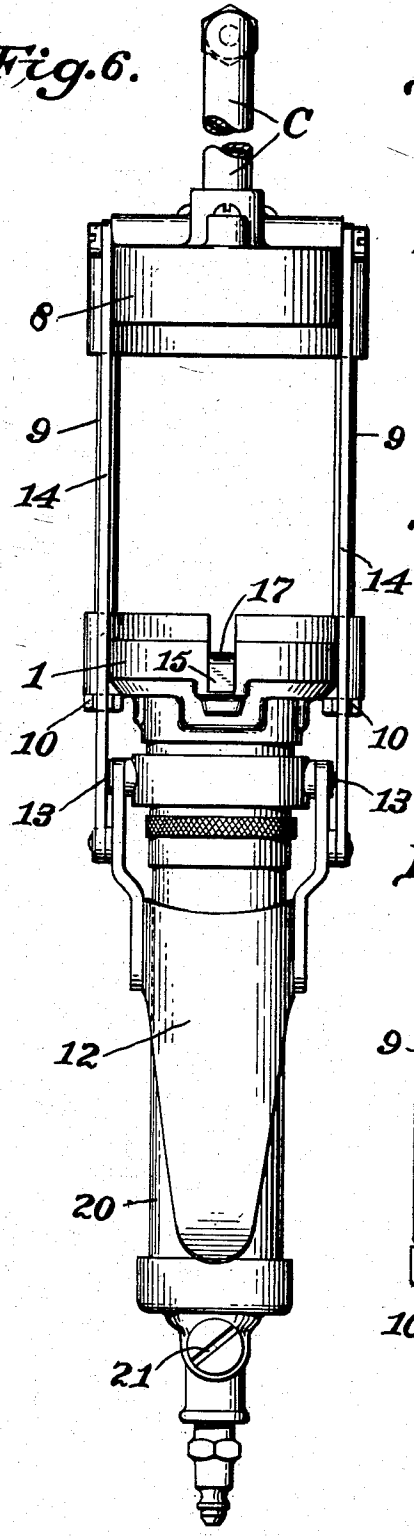


Fig. 7.

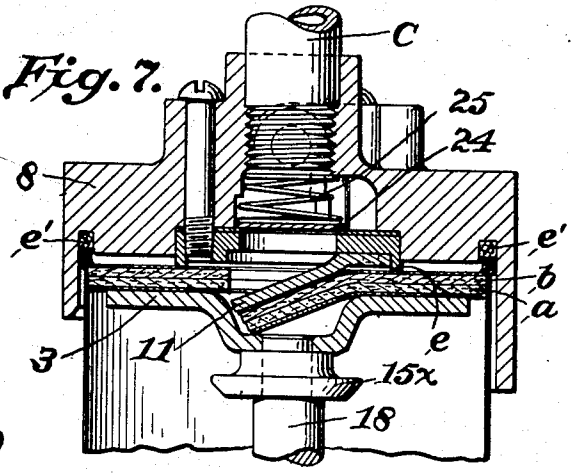


Fig. 8.

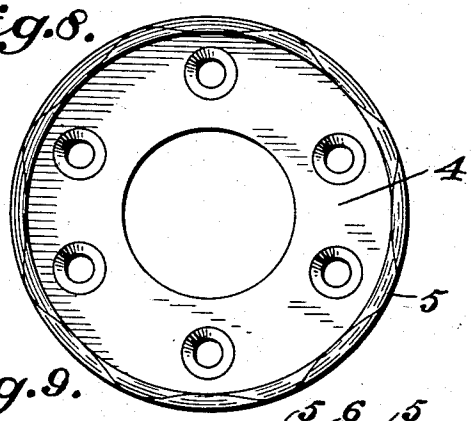


Fig. 9.

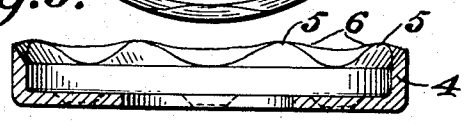
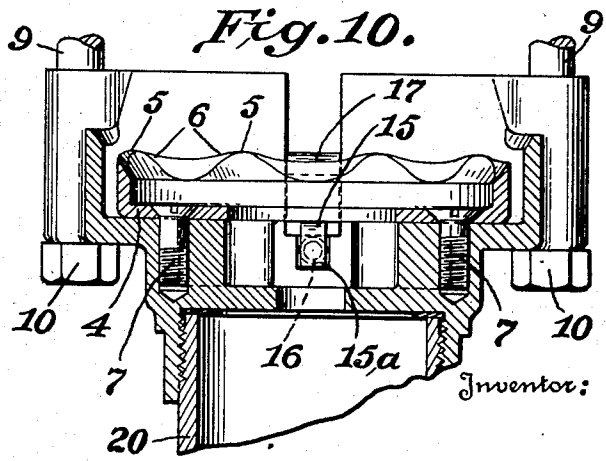


Fig. 10.



Inventor:

Richard E. Hulme,

By Spear, Donaldson & Hall

Attorneys.

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UNITED STATES PATENT OFFICE

2,105,039

METHOD AND APPARATUS FOR DISPENSING GREASE, OIL, AND THE LIKE, AND CAN THEREFOR

Richard E. Hulme, Bradford, Pa., assignor to Kendall Refining Company, Bradford, Pa., a corporation of Pennsylvania

Application May 29, 1935, Serial No. 24,138

25 Claims. (Cl. 221—47.3)

The invention comprises an oil or grease dispensing apparatus enabling the commodity to be dispensed directly from the package or can in which said commodity is packed and marketed.

The invention consists of the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the accompanying drawings

Figure 1 is a vertical sectional view of the grease gun ready to receive the can or carton.

Fig. 2 is a sectional view of a portion of the apparatus, enlarged in respect to the dimensions of Fig. 1 and showing the can deposited in the apparatus and said apparatus ready to be closed upon the can.

Fig. 3 is a view similar to Fig. 2 with the can clamped in place and with one end punctured and the other end cut out.

Fig. 4 is a sectional view on line 4—4 of Fig. 3 with the can omitted.

Fig. 5 is a sectional view on line 5—5 of Fig. 3 with the can omitted and certain parts broken away.

Fig. 6 is a front elevation of the apparatus.

Fig. 7 is a detail view showing certain of the parts at one period of the operation of the apparatus.

Fig. 8 is a detail plan view of the ring cutter.

Fig. 9 is a sectional view of the ring cutter.

Fig. 10 is a detail view relating to a detent member and adjacent parts.

In carrying out this invention I employ a can or carton for holding and marketing the grease, having a structure substantially similar to that of an ordinary can having a body portion preferably cylindrical and heads or end portions united with the body portion by crimping the contiguous edges together.

For providing packing for the cans or cartons a disc *a* is employed of cardboard or like material having on its inner face, or the face which is presented to the interior of the can, a disc of paper or like material *b*, coated or impregnated with suitable material which will be impervious to oil or grease, said material being, as an instance, an asphaltum compound or a rosin size. This packing lies normally against one of the heads of the can i. e. that head which is to be severed from the body leaving an open end through which the plunger of the apparatus may gain entrance to the can for the discharge of the oil or grease therefrom.

This can or carton when filled and sealed, with the packing disc therein at one end is marketed as a complete unitary article so that the purchaser may dispense the oil or grease therefrom with the aid of the grease gun forming a part of this invention.

This grease gun comprises member 1 of circular form having within it a cavity for receiving the end of a can, such as above described. The main part of said cavity receives a plunger 3 surrounding which is a circular knife or cutting blade 4, adapted to cut out the bottom of the can close to the side wall thereof.

This knife is in the form of a ring with its cutting edge directed inwardly of the apparatus, said cutting edge having high points 5 for penetrating the sheet metal can bottom and inclines 6 for exercising a draw cut action on the sheet metal for cutting out from the bottom of the can a section of substantially the full diameter of the can, for the entrance of the plunger into the can, for the discharge of its contents.

This knife encircles the plunger and it is secured to the frame member 1 by screws 7 passing through the base flange thereof.

When the can is initially seated its bottom rests upon the high points of the knife. Pressure exerted upon the can forces it down upon the knife for the cutting action.

This pressure is exerted by a head member 8 of circular form arranged with its axis coinciding with the axis of the circular frame member 1 and the plunger and the can.

This head member is mounted to slide upon guide rods 9 extending up from the frame member 1 to which they are attached by their screw threaded ends and nuts 10. This head member has on its inner face a blade 11 for puncturing the upper or head end of the can, so as to provide an outlet opening at this point through which the grease or other contents may be discharged from the can, through a suitable discharge pipe C to the point of delivery by the action of the plunger 3. The movable head 8 is operated by a hand lever 12 pivoted to the frame of the apparatus at 13, said lever being connected by links 14 with the head so that by operating the lever the head will be drawn down towards the central frame ring or member 1. This will result in puncturing the top of the can by the action of the movable puncturing blade or knife 11 thereon and then the severance of the bottom section of the can from the rest of the can will take place by forcing the can against the circular knife, it being noted that the ring shaped

knife encounters greater resistance than the puncturing blade.

The movement of the can performs another action in that it releases detents 15 from engagement with the plunger 3 so that said plunger then may be operated by any suitable means to enter the can and discharge its contents therefrom. In this discharging action the plunger forces the severed can bottom along the bore of the can, in front of it, and furthermore the packing disc or gasket is also forced along in front of the cut out bottom section and this packing disc by wiping along the wall of the can insures the prescribed discharge of the body of oil or grease from within the can, and this discharge takes place through the top opening punctured in the can top. In this discharge action the packing disc as well as the cut out can bottom will be maintained in their prescribed positions coaxial with the can, by reason of the fact that the action of the plunger is coaxial with the can and the parts are moved against the resistance offered by the body of grease.

Previous to the operation or retraction of the detents 15 by the pressure of the can edge thereon the plunger will be held against accidental action by the detents 15. These detents are spring pressed, the springs being shown at 16. When the can is forced downwardly its bottom is first acted on by the knife for cutting out the bottom section and immediately thereafter the bead of the can effectively operates the detents and forces them outwardly by engaging the inclined surfaces 17 thereof and the plunger is thereby released and is now ready to be operated.

Various means may be employed for operating the plunger. As an example of one form a rod 18 is suitably connected with the plunger 3, having at its lower end connection with a piston 19 working in a cylinder 20 which is connected with the central frame ring 1. This piston is suitably packed to make it fluid tight. We will suppose air is used to operate the piston. The supply of this fluid is controlled by a valve 21 operated by a finger lever 22 pivotally mounted on the frame and depending from its pivot. When the valve is opened air will be admitted to operate the piston which will in turn operate the plunger and discharge the grease from the can. A spring 23 restores the piston to its lowermost position.

By reason of the use of the detents and their dependence upon the proper positioning and operation of the can for their release damage to the operator or attendant is prevented. Were these detents not used the plunger might be operated accidentally and contact take place with the hand which might unintentionally be grasping the upper part of the apparatus within the confines of the same.

While the apparatus has been described as though it were in upright position, i. e., with the axis of the can, plunger, etc., disposed vertically, it will be understood that it may be used in any position and when used horizontally it is convenient to drop the can into place between the movable head 8 and the central circular frame member 1. It may be noted in this connection that the guide bars on which the head 8 slides are not located diametrically opposite each other, but are disposed off to one side of the apparatus.

The movable head which carries the puncturing blade is provided with a portion *e* to bear on the can end to prevent it from bulging outwardly as a result of the pressure exerted thereon when the plunger presses upon the grease contained in the can.

The bearing portion *e* of the movable head of the apparatus not only holds the end wall of the can against bulging outwardly under the working pressure, but it also forms a seal around the punctured discharge opening to prevent leakage of the grease, oil, or other commodity. In addition to this there is a sealing ring *e'* in the head of the apparatus against which the end head of the can seats to prevent leakage.

It will be understood that in the final part of the operation of extruding the contents of the can therefrom the packing disc as well as the loose cut out can end lying against the face of the plunger will be punctured by the knife blade carried by the head of the apparatus, and these parts thus can be moved clear up to the inner or under side of the end wall of the can at its discharge end. This will enable the entire contents of the can to be extruded. For the purpose of allowing the final discharge movement of the plunger to take place, as just mentioned, and without interference by the projecting puncturing blade, the plunger is provided with a central recess in its front face to receive the end of said blade. The face of the plunger, therefore, can move to a position to force the packing disc substantially against the inner side of the punctured end of the can so that all the contents will be discharged from the can.

By the construction described a double seal is obtained at the discharge end of the can, the outer seal being effective to prevent leakage of the oil or grease even though the inner seal be rendered inefficient by reason of a damaged can end.

A check valve is employed at 24 pressed to its seat by a spring 25, to prevent back flow of the discharged contents of the can.

The gasket or packing disc is initially larger in diameter than the interior diameter of the can to insure a tight fit, and consequently the complete discharge of the can's contents.

As a means of indicating which end of the can is intended to become the discharge end, or in other words in order to provide an indication which will enable the can to be positioned with its gasket containing end adjacent the ring shaped knife various means may be employed. I show as an example of such means a large arrow which may appear at one or a plurality of points on the can, said arrow or arrows indicating by their points the particular end of the can which is to lie at the discharge end of the gun, said arrow may have associated therewith the inscription, "This arrow must point to discharge end of gun."

This means of indication enables the attendant to be sure that he is placing the gasket containing end of the can against the ring shaped knife.

While various provisions may be made as a factor of safety for preventing operation of the plunger, the means which I illustrate as an example are the detents 15 above mentioned. These detents are slidably mounted to move radially of the apparatus. They have their inner ends 15*a* so located as to overlay a flange 15*x* on the plunger rod for holding the plunger against operation. The detents also have upstanding portions provided with inclined inner faces 17 to be contacted by the bead at the end of the can, so that the can as it moves to its final position

will operate against these inclines and retract the detents outwardly. This flange 15x is beveled at its lower side so that as the plunger is retracted to its position of rest the flange can pass the detents which yield outwardly for this purpose.

The can above described offers the desirable feature of being sealed at the factory, or the place where the can is packed, so that tampering with the can, or substitution of other material for the prescribed commodity is prevented.

Fig. 2 shows that by holding the apparatus horizontally the can may be readily positioned by depositing it to rest, on the flanges of the head and the frame member 1, and then by operating the hand lever the head 8 will move the can leftward (in Fig. 2) to bring on the operations above described.

I claim:

1. A dispensing apparatus having a substantially ring shaped knife to cut out the end portion of a can, a plunger for applying pressure to the cut out can end for forcing it axially of the can towards the opposite end thereof, and for effecting the discharge of the can's contents through said opposite end, and means for puncturing said opposite discharge end to provide a discharge outlet.

2. A dispensing apparatus according to claim 1 in which said means for puncturing include a relatively movable head carrying a blade for puncturing the said opposite end of the can to provide said discharge outlet, said head forcing the can against the ring shaped knife for cutting out the end thereof which is adjacent to the plunger.

3. Apparatus according to claim 1 in which the puncturing blade is so constructed relative to the construction of the ring shaped knife as to puncture the discharge opening in the can end prior to the cutting out of the can end by the ring shaped knife.

4. Apparatus according to claim 1 in which the puncturing blade is of greater cutting capacity than the ring shaped knife and cuts the discharge opening in the can end before the ring shaped knife and the plunger operate to cut out the can end and force it together with the contents along the interior of the can for the discharge of the latter.

5. Apparatus according to claim 1 in which detent means are provided for preventing accidental operation of the plunger, said detent means being controlled to render said plunger operative by the placing of the can in position for dispensing.

6. Apparatus according to claim 1 in which detent means holds the plunger against action, said detent means being contacted by the can for the release of the plunger, substantially as described.

7. Apparatus according to claim 1 in which detent means engages the plunger for holding the same against accidental operation, said detent means being in the path of movement of the can on its way to its position in the apparatus, said detent means being operated by contact of the can to release the plunger.

8. Apparatus according to claim 1 in which a packing member within the can adjacent the end which is cut out moves along and wipes the interior wall of the can under the action of the plunger moving axially within the can, said packing member being in the form of a disc of a diameter to tightly fit the interior wall of the can, said disc lying at the inner side of the end of the can cut out by the ring shaped knife said puncturing means puncturing an opening also in said disc and in said cutout can end.

9. In combination in a dispensing apparatus, a frame member having a recess for receiving a can end, a substantially ring shaped knife in said recess of substantially the diameter of the can end, a plunger initially located within the ring shaped knife, a head coaxially arranged with and spaced apart from the frame member to receive between them a filled can, said head carrying a blade to punch a discharge opening in the end of the can, a guide frame, and means for effecting relative movement of the said head and frame member along said guide frame to cause the blade to punch the discharge opening and the ring shaped knife to cut out the opposed end of the can, and means for operating the plunger to move the cut out can end towards the discharge end of the can together with the can contents for the discharge of the latter from the can, substantially as described.

10. In apparatus of the class described, a head having a blade for puncturing the end wall of a can, and having a discharge opening adjacent the blade, said head having an annular sealing portion adjacent and surrounding the discharge opening to prevent the leakage of the contents of the can, and said head having a second annular sealing portion outside of the first and to be borne upon by the bead of the can.

11. In apparatus of the class described, a head having a discharge opening and a puncturing blade projecting from the head to puncture a can end to form a discharge opening, said blade extending into the can, means to cut out a section of the opposite end of the can, and a plunger adapted to move within the can and force the said cut out section and a contained packing member to the discharge end of the can, said cut out section of the said opposite end and the packing being punctured in said operation by the said puncturing blade, so that said parts may pass beyond said blade and to a position substantially against the inner side of the wall of the can end at the discharge end of said can, substantially as described.

12. In apparatus according to claim 11, the provision in the plunger of a recess to receive the puncturing blade to allow said plunger to move unobstructedly to a point adjacent the discharge end of the can for the discharge of all its contents, substantially as described.

13. In apparatus of the class described, a circular knife for severing one of the can ends from the body, a cutter for puncturing the opposite can end at an area spaced apart inwardly from the margin of said opposite can end, supporting means for said knife and cutter comprising heads having relative movement, the head supporting the puncturing cutter having a sealing portion to contact with the can end around the puncturing cutter and spaced apart inwardly from the margin of the said can end, substantially as described.

14. In combination in dispensing apparatus, a ring shaped knife to cut out one end of a can, means for puncturing the opposite end of the can at a point spaced apart inwardly from the margin of said end, a plunger with means for operating it to move the cut out end along the interior of the can substantially all the way to the punctured end of the can, said plunger having a free space to avoid contact with the punc-

turing means, the said cut out can end being punctured in passing the puncturing means, substantially as described.

15. In dispensing apparatus according to claim 14, a packing member within the can lying initially against the can end which is to be cut out, said packing member being puncturable by the puncturing means when moved by the plunger beyond said means, substantially as described.

16. In apparatus of the class described, a circular cutter for cutting out one end of a can, a cutter for punching a discharge opening in the other end of the can, said punching cutter having a cutting edge of less extent than the cutting edge of the circular cutter, and means for holding the can in relation to the circular cutter and punching cutter, and for bringing said cutters into operation upon their respective can ends, the more limited extent of edge of the punching cutter causing said cutter to punch the can end belonging thereto prior to the severing of the other can end by the circular cutter, and a plunger for discharging the contents from the can through the punctured discharge opening with means for operating said plunger to perform its discharge stroke after the one can end is punctured and the other is severed from the can, substantially as described.

17. In a lubricant dispenser in combination, an original lubricant package of substantially cylindrical side wall shape having a closed end adapted to be substantially wholly cut away, and means for cutting away said closed end and for forcing lubricant through an opening at the opposite end of the package comprising, an annular knife engageable with said closed end adjacent the side walls to cut out said end, means for moving the knife toward the cartridge to perform said cutting operation, means engageable with said cut out end to move it through the cartridge to force the lubricant therefrom, and means mounted on the dispenser for cutting the opening in the said opposite end of the package.

18. In a lubricant dispenser in combination an original lubricant package of substantially cylindrical side wall shape having a closed end adapted to be cut, an annular knife for cutting said closed end, a plunger for forcing the cut end away from the knife to the opposite end of the package, means for operating the plunger, and packing for wiping the wall of the package, during the movement of the cut end away from the knife, substantially as described.

19. Dispensing apparatus having means for forming a discharge outlet in one end of a can, a substantially ring shaped knife for cutting out one end of the can, means for effecting relative movement between the can and knife for performing said cutting out operation and means for relatively moving the can and said cut-out end for effecting the discharge of the can's contents through said outlet.

20. Dispensing apparatus comprising a device having a space to receive the end of a can, means for holding a can with its end in said space, a cutter arranged to form a discharge opening in the can, an annular knife arranged to act on one end of the can to cut out said end of the can, means for effecting relative movement between the can and knife, and means for effecting relative movement of the can and said cutout end to discharge the contents of the can through said opening.

21. In combination a frame in which a can end may be seated, a ring shaped knife, a plunger operating relative to and within the knife, means for operating the plunger through the ring-shaped knife and detent means engaging the plunger to hold it against movement, said detent means being released by the can end in the act of seating said end within said frame, substantially as described.

22. Apparatus according to claim 21 in which the detent means is radially movable relative to the axis of the can and has an incline against which the bead of the can head operates to retract said detent to release the plunger, substantially as described.

23. Apparatus according to claim 1 in which the plunger has a recess to receive the puncturing means whereby said plunger can move to a position close to the discharge end of the can in terminating its stroke, substantially as described.

24. A grease dispensing apparatus having means associated with one head of a container, including a knife for cutting a discharge opening therein axially of the same, and means associated with the opposite head of the container, including a knife for cutting out said head, and mechanism, including a hand operated lever, for moving said knives towards each other in effecting the cutting of the discharge opening and the cutting out of said head, and means for relatively moving the container and the last named cut-out head thereof for ejecting the contents of the can through said discharge opening.

25. In a grease dispensing apparatus, means for cutting a discharge outlet in one end of the can and for cutting out the head of the opposite end of the can in a continuous movement, said means including a movable head, a hand operated lever, and connections therefrom to the head for operating it, means for effecting movement of the cut out end of the can lengthwise of the can for discharging its contents, and means for preventing the operation of the last named means automatically releasable in the can head cutting out operation.

RICHARD E. HULME.