

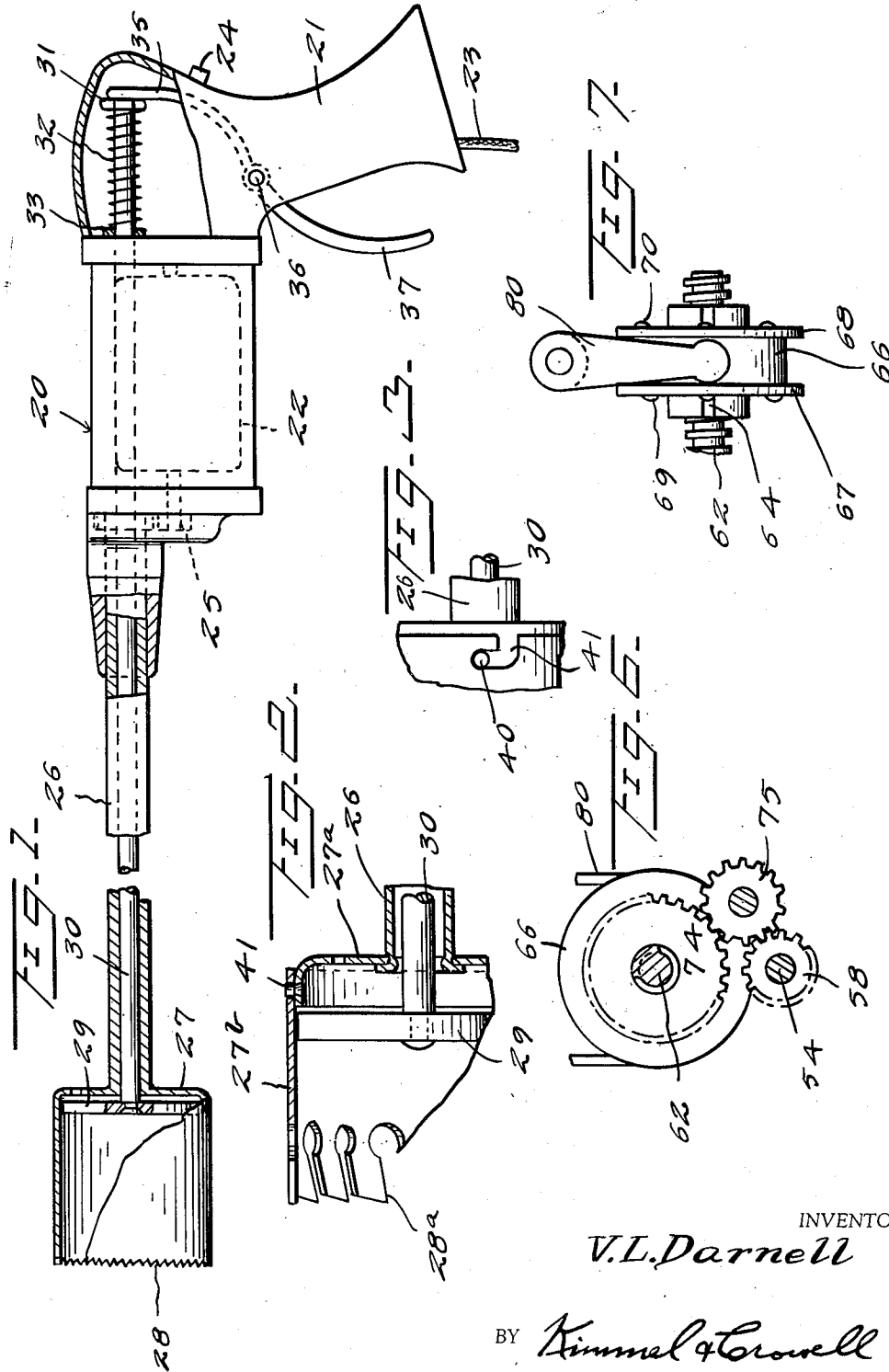
April 1, 1952

V. L. DARNELL
DISPENSING DEVICE

2,591,516

Filed May 8, 1950

2 SHEETS—SHEET 1



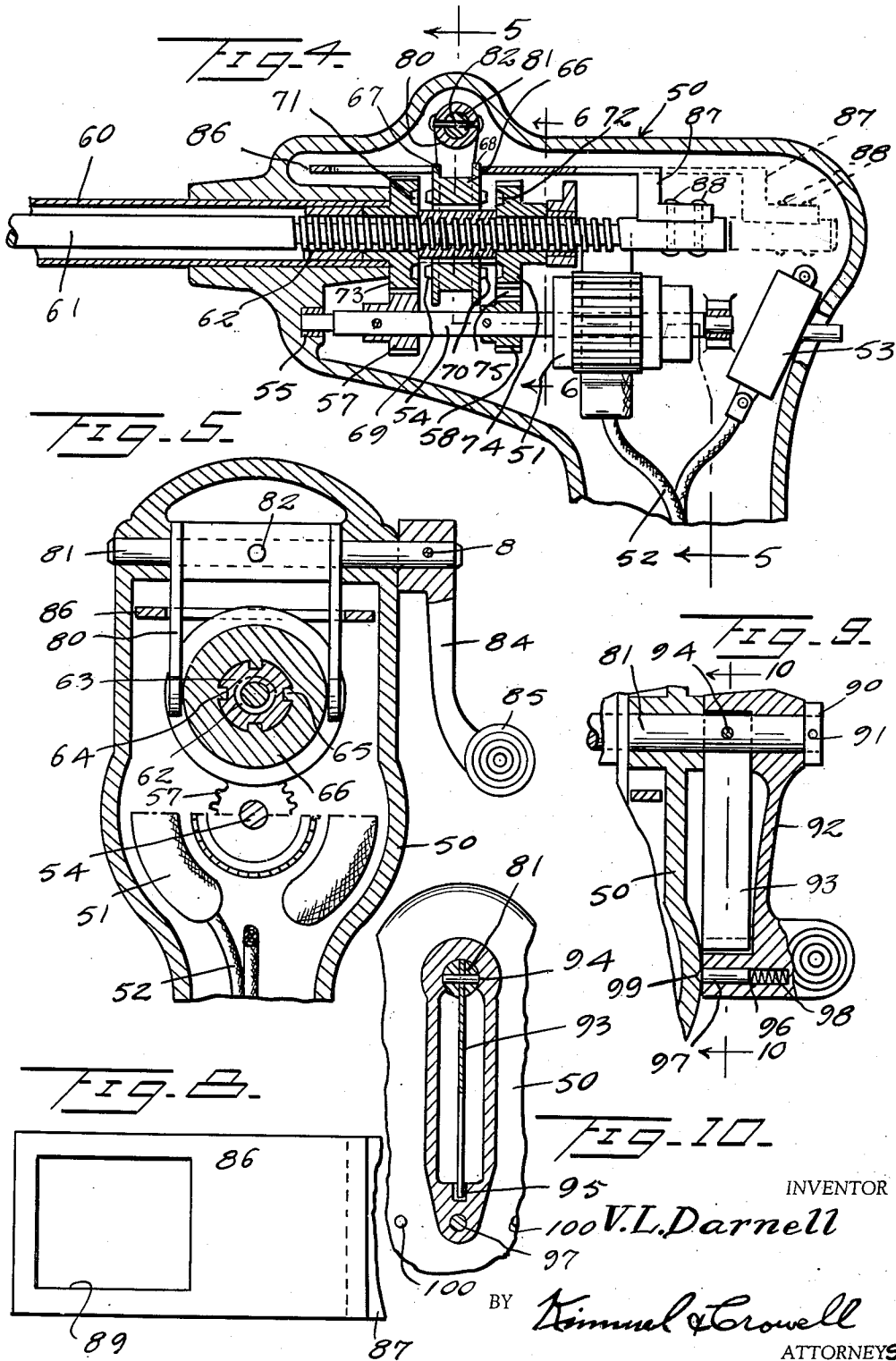
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2 SHEETS--SHEET 2



UNITED STATES PATENT OFFICE

2,591,516

DISPENSING DEVICE

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6 Claims. (Cl. 107—48)

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This invention relates to a dispensing device and, more particularly, to a dispenser for semi-fluid substances, such as ice cream, grease, lard, and the like.

The primary object of the invention is the provision of an improved device for obtaining samples or measured amounts of such semi-fluid contents from deep containers.

An additional object of the invention is the provision of a device of this character adapted to reduce the manual effort involved in obtaining such samples or quantities.

Still another object of the invention is the provision of such a device particularly applicable to the obtaining of predetermined quantities of the contents of deep containers in such manner as to avoid the necessity of the user thereof inserting his hand or arm into the container, thus avoiding the possibility of the contraction of rheumatism or other ailments occasioned by exposure to the relatively low or high temperatures of such containers in accordance with their content.

A more specific object of the invention is the provision of a device which will obtain measured quantities of relatively hard semi-solid substances such as tightly packed, hard frozen ice cream with a minimum of time, effort and difficulty, and means for readily removing the substance from the device when desired.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there are shown preferred forms of this inventive concept.

In the drawings:

Figure 1 is a side view partially in elevation and partially in section disclosing one form of this invention.

Figure 2 is a fragmentary enlarged sectional view showing a modified form of dispensing cup.

Figure 3 is a fragmentary top plan view of a portion of the construction of Figure 2.

Figure 4 is a longitudinal vertical section taken substantially along the center line of a modified form of construction, parts thereof being broken away.

Figure 5 is a sectional view taken substantially along the line 5—5 of Figure 4 as viewed in the direction indicated by the arrows.

Figure 6 is a sectional view taken substantially along the line 6—6 of Figure 4 as viewed in the direction indicated by the arrows.

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Figure 7 is a fragmentary side plan view showing certain constructional details.

Figure 8 is a top plan view, partially broken away, of a further constructional detail.

Figure 9 is a fragmentary vertical sectional view showing a modified form of operating handle; and

Figure 10 is a sectional view taken substantially along the line 10—10 of Figure 9 as viewed in the direction indicated by the arrows.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring first to the construction of Figure 1, there is generally indicated at 20 a casing or container providing with a gripping handle 21, and containing a conventional electric motor 22 as, for example, of the type utilized in rotary drills, the motor being provided with current through a cord 23 and actuated by a conventional operating switch 24.

Motor 22 is adapted to rotate, when energized, through a conventional reduction gearing system 25, a tubular sleeve 26, to the lower extremity of which is connected a cup-like member 27 having an open outer face, the edge of which is provided with a cutting edge which preferably includes a series of cutting teeth 28, of a design most adaptable to the substance in which it is to be used.

Interiorly of cup-shaped member 27 is a plunger 29 secured to one end of an actuating or operating rod 30 which extends interiorly through the tubular sleeve 26. The opposite end of rod 30 extends between the upper portion of the coils of motor 22 in housing 20, and is provided at one end with a head 31 against which seats one end of a coil spring 32, the opposite end of which abuts any suitable shoulder or flange 33 interiorly of casing 20 normally to bias rod 30 and its associated plunger to retracted position within the cup 27. Any suitable means may be provided to hold rod 30 against rotation with sleeve 26, although in this modification this is not necessary.

One end of an operating lever 35 abuts the head 31 of rod 30, the operating lever being pivotally mounted as on a pivot 36 interior of handle 31 and having a trigger portion 37 thereof extending outwardly adjacent to handle 21 and spaced therefrom.

From the foregoing the operation of the device should now be readily understandable. When switch 24 is actuated to energize motor 22, sleeve 26, and, consequently, cup 27 will be rotated at

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any desired speed effecting a cutting action on the substance to be dispensed, while downward pressure on the device will cause the complete filling of the cup 27. The substance is then transferred to its desired location and ejected simply by compressing trigger portion 37 toward grip 21 which will, through rod 30, effect linear movement of plunger 29 to eject the substance within the cup 27.

Figures 2 and 3 disclose a modified form of cup construction which includes a top portion 27 secured for rotation to tube 26, the top portion 27a being provided on opposite sides with studs 40 which engage in suitable arcuate slots 41 in a sleeve portion 27b, the combined top and sleeve portion forming a cup similar to the previous cup 27. By such an arrangement cup 27b can be easily removed for cleaning purposes. Any desired form of teeth, as for example, those disclosed at 28a may be provided on sleeve portion 27b, and the sleeve portions 27b may be readily interchanged for the use of any desired type of cutting sleeve. In some instances a smooth toothless cutting edge is advantageous.

The construction of Figures 2 and 3 is also provided with a plunger 29 connected to a rod 30, and the operation of the device is, in all respects, similar to the construction of Figure 1.

Figures 4 to 8, inclusive, disclose a modified form of construction particularly adapted for use with deep tanks and the dispensing of relatively large quantities of fluid wherein motor means for reciprocating the plunger rod are provided. This construction comprises a housing or casing generally indicated at 50, and containing a conventional electric motor 51 supplied with current through a cord 52 and actuated by conventional switch means 53. The drive shaft 54 of motor 51 has one end journaled in a bushing 55 formed in front wall of the casing, and has mounted thereon a plurality of reduction gears 57 and 58. The gear 57 meshes with a gear 73, which is fixedly secured to a sleeve 60, corresponding in purpose and function to the previously described sleeve 26, whereby upon actuation of motor 51 the sleeve 60 is adapted to rotate for the purpose of filling a cup of the character previously described.

Concentric with and extending interiorly of sleeve 60 is an operating rod 61 similar in purpose and function to the previously described rod 30, but provided interiorly of housing 50 with a threaded portion 62. Mounted on the threaded portion 62 at the intermediate point thereof is a nut 63 threaded to coact with the threaded portion of the rod 61 and provided exteriorly with a plurality of grooves or channels 64 adapted to be engaged by corresponding splines 65 formed interiorly of a central aperture in a clutch disc 66.

The clutch disc is provided with end plates 67 and 68, each provided on its outer face with a plurality of detents or drive lugs 69 and 70, respectively, which are adapted to engage selectively in corresponding recesses 71 and 72 formed in gears 73 and 74, respectively. The gears 73 and 74 are mounted for rotation on the shaft 61. Lugs 69 and 70 are slightly tapered to facilitate engagement and disengagement under load. Gear 73 is adapted to mesh directly with the gear 57, and, correspondingly, to be rotated in the same direction as sleeve 60, while the gear 74 is driven through an intermediate gear 75 by means of gear 58 and is thus adapted to rotate in an opposite direction. It will thus be apparent that when the clutch 66 is moved in one direction,

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rotation of the nut by means of the engagement of the clutch member with the detents in the adjacent gear will cause longitudinal movement of the rod 61 in one direction while movement of the clutch member 66 in the opposite direction will engage the oppositely rotated gear to effect longitudinal movement of the rod in an opposite direction, it being noted that rod 61 is held against rotation in a manner to be described hereinafter.

Such longitudinal movement is effected by means of a rockable fork member 80, the legs of which extend between the plates 67 and 68 in such manner that rocking movement of the fork will move the clutch assembly in either direction selectively as desired. The fork member is adapted to be pivotally mounted on a transverse shaft 81 journaled in the side walls of the casing, and locked thereto as by means of a dowel 82. One end of the shaft 81 extends exteriorly of the casing and has affixed thereto as by a dowel 83 an operating handle 84 provided with a thumb grip portion 85 whereby the shaft and its associated fork may be rocked to provide movement in the previously discussed clutch member.

Means are provided for limiting the movement of the shaft in either direction, and also to preclude rotation thereof and take the form of a rectangular plate member 86 secured to a bracket 87 which in turn is secured as by means of rivets 88 to the extremity of shaft 61. The plate is provided with a rectangular aperture 89 which extends about fork member 80, the arrangement being such that when the clutch has been engaged with one of the gears 73 or 74 for a sufficient length of time to permit movement of the shaft 61 to extend or retract its associated plunger the necessary distance, the adjacent edge of the plate will engage the fork member to remove the clutch from engagement with its associated gear. Obviously the engagement of the sides of aperture 89 with fork 80 precludes rotation of shaft 61 when nut 63 is rotated.

In certain instances it may be desired that this disengaging mechanism act automatically to eliminate the necessity of the operator continuously holding his thumb on the lever 85. For this purpose the mechanism disclosed in Figures 9 and 10 is provided, wherein the shaft 81 is provided at its outer end with a collet 90 affixed thereto by dowel 91, the collet serving to hold on the extending end of rod 81 a handle 92 which is thus permitted swinging movement relative thereto. Interiorly of the handle 92 there is provided a leaf spring 93, one end of which is doweled as at 94 within a suitable slot in shaft 81, and the other end of which extends into a slot 95 in the lower end of the operating handle, the spring thus serving normally to bias the handle and, hence, its associated shaft and clutch connections to central or neutral position. The lower end of the handle is provided with a bore 96 within which is mounted a pin 97 biased outwardly as by a spring 98, the pin being provided with a rounded extremity 99 adapted to engage in oppositely spaced detent apertures 100 formed in the side wall of the casing 50. In this construction, movement of the handle in either direction may be readily effected, and the handle retained in operating position by means of pin 97 until one edge of the aperture 89 engages fork 80 which engagement will then effect disengagement of the rounded end 99 of the pin from its associated aperture 100, and will thus permit spring 93 to return the assembly to central or

neutral position. The shape of the end of the pin is such as to effectively hold the handle in desired position, but at the same time to permit ready disengagement from its associated detent when actuated by plate 86.

From the foregoing it will now be seen that there is herein provided an improved dispensing device for semi-liquid substances of the character described which accomplishes all the objects of this invention and many others including advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

1. In a dispensing device for semi-fluid substances, a casing motor means in said casing, a drive shaft for said motor, a gear on said drive shaft, a sleeve, a gear on said sleeve meshing with said first-mentioned gear whereby actuation of said motor rotates said sleeve, a cup carried by said sleeve, a reciprocally movable ejector plunger in said cup, a rod secured to said plunger and extending through said sleeve into said casing means securing said rod against rotation, and means including threads on said rod and a nut engaging said threads rotatable by said motor in said casing connected to said motor for reciprocating said rod and, hence, said plunger.

2. In a dispensing device for semi-fluid substances, a casing, motor means in said casing, a drive shaft for said motor, a gear on said drive shaft, a sleeve, a gear on said sleeve meshing with said first-mentioned gear whereby actuation of said motor rotates said sleeve, a cup carried by said sleeve, a reciprocally movable ejector plunger in said cup, a rod secured to said plunger and extending through said sleeve to said casing means securing said rod against rotation, a portion of said rod being threaded, a nut engaging said threaded portion, a clutch engaging said nut, gear means in said casing oppositely rotatable by said motor means, and means for selectively engaging said clutch with said gear means to effect opposite rotation of said nut and, hence, reciprocating movement of said rod to move said plunger.

3. In a dispensing device for semi-fluid substances, a casing, motor means in said casing, a drive shaft for said motor, a gear on said drive shaft, a sleeve, a gear on said sleeve meshing with said first-mentioned gear whereby actuation of said motor rotates said sleeve, a cup carried by said sleeve, a reciprocally movable ejector plunger in said cup, a rod secured to said plunger and extending through said sleeve to said casing, means securing said rod against rotation, a portion of said rod being threaded, a nut engaging said threaded portion, a clutch engaging said nut, gear means in said casing oppositely rotatable by said motor means, means for selectively engaging said clutch with said gear means to effect opposite rotation of said nut and, hence, reciprocating movement of said rod, and means for disengaging said clutch after a predetermined movement of said rod in either direction.

4. In a dispensing device for semi-fluid substances, a casing, motor means in said casing, a drive shaft for said motor, a gear on said drive

shaft, a sleeve, a gear on said sleeve meshing with said first-mentioned gear whereby actuation of said motor rotates said sleeve, a cup carried by said sleeve, a reciprocally movable ejector plunger in said cup, a rod secured to said plunger and extending through said sleeve into said casing, means securing said rod against rotation, a portion of said rod being threaded, a nut engaging said threaded portion, a clutch engaging said nut, gear means in said casing oppositely rotatable by said motor means, means for selectively engaging said clutch with said gear means to effect opposite rotation of said nut, and, hence, reciprocating movement of said rod, and means for disengaging said clutch after a predetermined movement of said rod in either direction, said last mentioned means including an apertured plate secured to said rod and engageable by said clutch.

5. In a dispensing device for semi-fluid substances, a casing, motor means in said casing, a drive shaft for said motor, a gear on said drive shaft, a sleeve, a gear on said sleeve meshing with said first-mentioned gear whereby actuation of said motor rotates said sleeve, a cup carried by said sleeve, a reciprocally movable ejector plunger in said cup, a rod secured to said plunger and extending through said sleeve to said casing, means securing said rod against rotation, a portion of said rod being threaded, a nut engaging said threaded portion, a clutch engaging said nut, gear means in said casing oppositely rotatable by said motor means, and means for selectively engaging said clutch with said gear means to effect opposite rotation of said nut and, hence, reciprocating movement of said rod, said last mentioned means comprising a fork rockably mounted in said casing and an operating handle exterior of said case, for rocking said fork.

6. In a device of the character described, a casing, a motor in said casing, a drive shaft rotatable by said motor, first and second gears on said shaft, a sleeve extending from said casing, a cup secured to the outer end of said sleeve, a third gear mounted in said casing in mesh with said first gear secured to said sleeve for rotating said sleeve and hence said cup, an ejecting plunger reciprocable in said cup, a rod secured to said plunger extending into said casing, a threaded portion on said rod, means securing said rod against rotation, a nut engaging said threaded portion, clutch means secured to said nut, a fourth gear rotatably mounted in said casing, a reverse gear connecting said second and fourth gears, whereby said fourth gear is rotated oppositely to said third gear, and means for selectively engaging said clutch with either said third or fourth gear to rotate said nut to impart reciprocating motion to said rod and hence advance or retract said plunger in said cup.

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