Dec. 10, 1929. W. J. BAYNES 1,738,814

APPARATUS FOR EJECTING ICE CREAM AND THE LIKE FROM CONTAINERS

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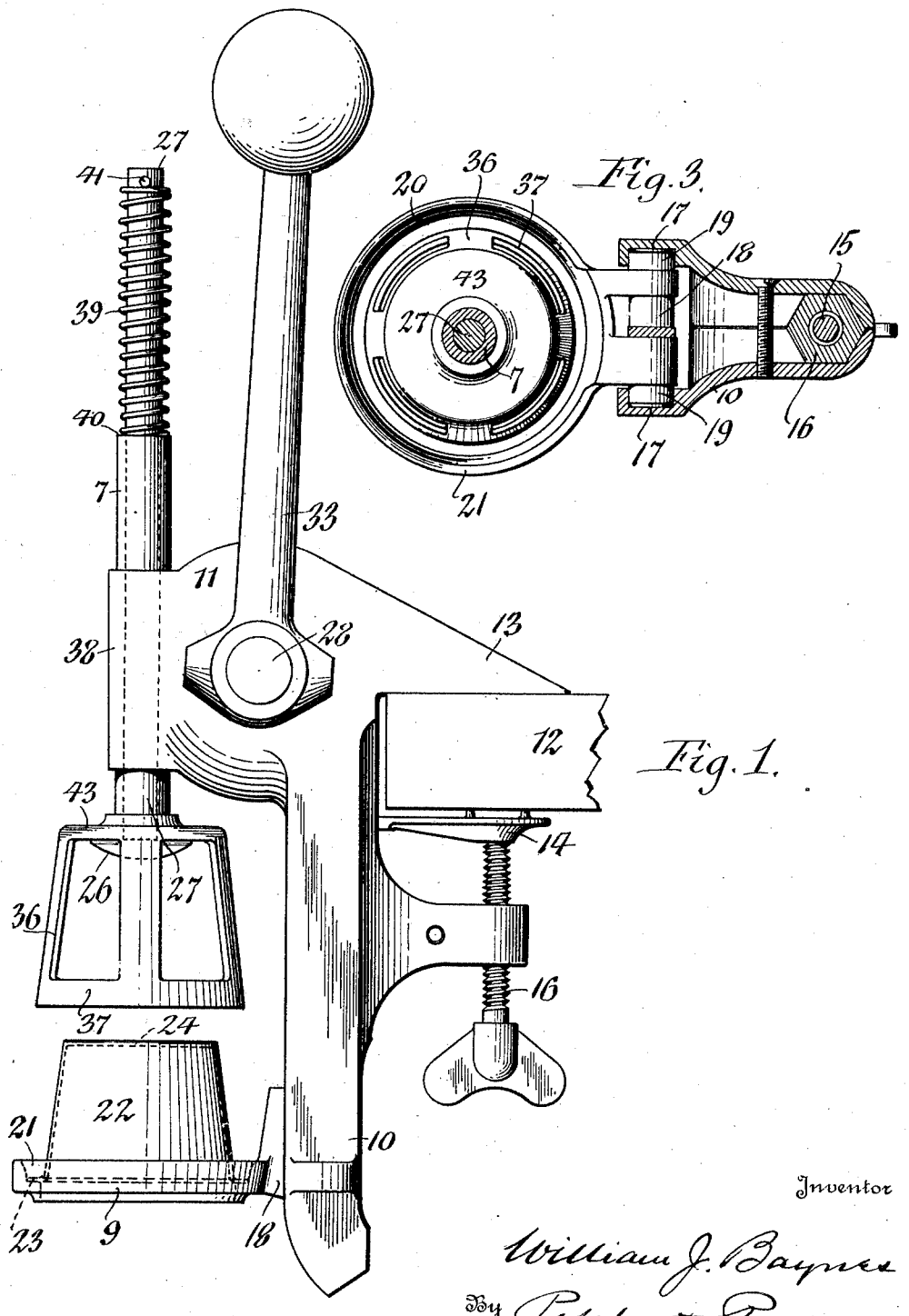


Fig. 1.

Fig. 3.

Inventor

William J. Baynes

By Pollock & Powers

Attorneys

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Fig. 4.

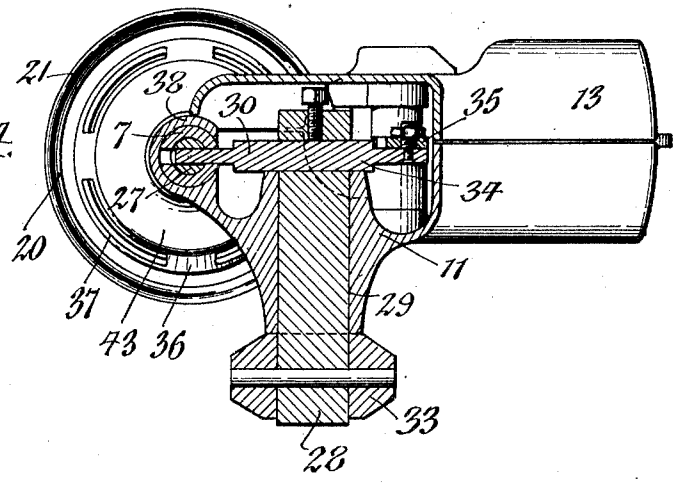


Fig. 2.

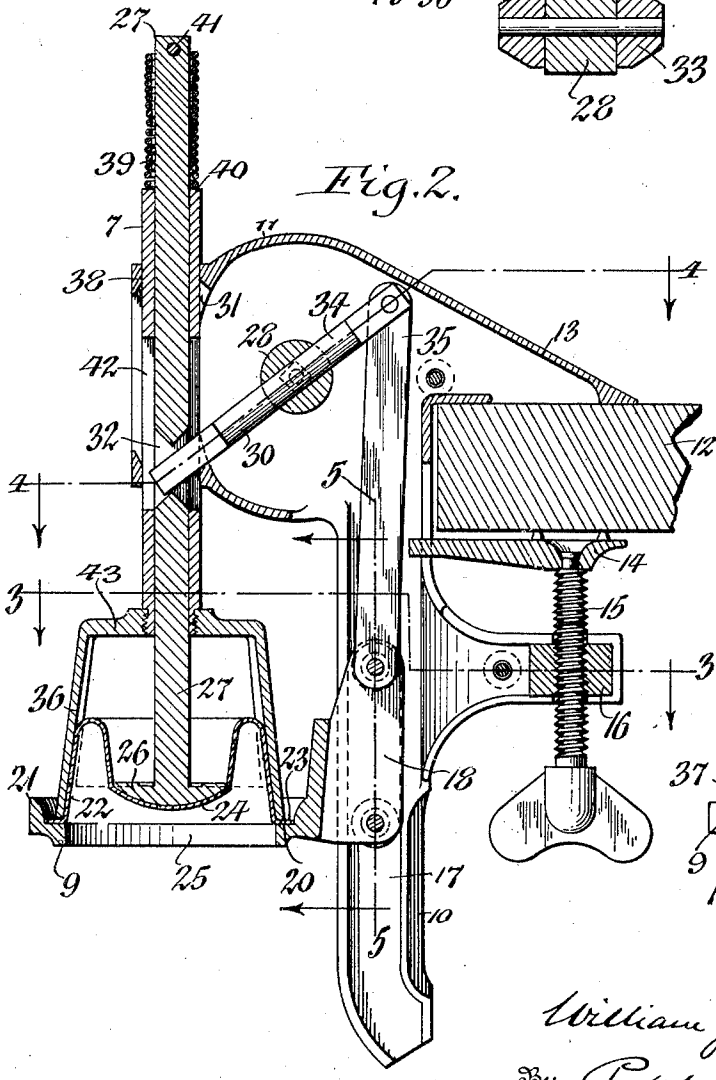
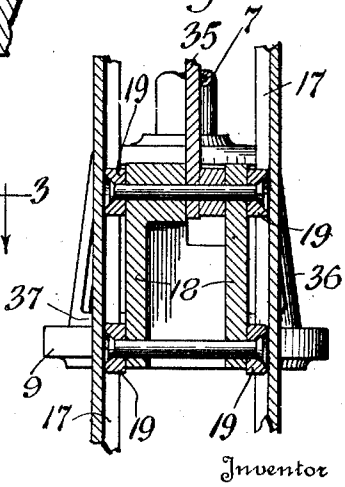


Fig. 5.



Inventor

William J. Baynes

By Popp & Powers

Attorneys

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UNITED STATES PATENT OFFICE

WILLIAM J. BAYNES, OF BUFFALO, NEW YORK

APPARATUS FOR EJECTING ICE CREAM AND THE LIKE FROM CONTAINERS

Application filed June 6, 1923. Serial No. 283,393.

This invention relates to an ejecting apparatus which is more particularly designed for removing ice-cream from cup-shaped containers, although the same may be employed to advantage in emptying other materials from such containers.

It is the object of this invention to provide an apparatus for accomplishing this purpose which is comparatively simple in construction, easily and quickly operable and capable of discharging the contents of a container into a receptacle without touching the same with the hands and thus rendering this operation sanitary.

In the accompanying drawings:—

Figure 1 is a side elevation of the ejecting apparatus embodying a practical form of my invention, showing the parts in the position which they occupy when the apparatus is open and ready to receive a container from which the contents are to be removed.

Figure 2 is a vertical longitudinal section of the same showing the parts in the position which they occupy when the discharge of the contents from a container has been completed.

Figures 3 and 4 are horizontal sections taken on the correspondingly numbered lines in Fig. 2.

Figure 5 is a vertical section taken on line 5—5 Fig. 2.

In the following description, similar characters of reference indicate like parts in the several views of the drawings:—

The main frame of this machine may be of any suitable construction but preferably of the form shown in the drawings. As there shown the same comprises an upright lower part 10, and an overhanging upper part 11 which projects forwardly from the upper end of said lower part, this frame being preferably provided with means for detachably mounting the same on the edge of a table 12 or similar support.

These means may consist of an upper jaw 13 adapted to engage with the upper side of the table, a movable lower clamping jaw 14 adapted to engage with the underside of the table, and a clamping screw 15 connected with the lower jaw 14 and working in a screw nut 16 mounted on the rear side of the main frame, as shown in Figs. 1, 2 and 3.

The upright lower part of the main frame is preferably constructed in the form of two upright channels 17 which face each other and form a guideway for a vertically movable carriage 18, which latter is arranged between these guideways and is provided on opposite sides with guide rollers 19 projecting into these guideways, as best shown in Figs. 2, 3 and 5.

Upon the front side of this carriage is mounted a support for the container from which the contents, such as ice-cream or the like, is adapted to be ejected or discharged. This support in the preferred construction has the form of a ring 9 which is connected at its rear edge with the carriage 18 and has its axis arranged vertically. On the upper side of this supporting ring the same is provided with an annular shelf or shoulder 20 and around this shoulder this ring is provided with an annular upwardly projecting retaining rim or flange 21, so that this flange together with the shoulder 20 forms a rabbeted annular seat on the upper side of this ring, around the central opening 25 of the same.

The container from which the ice-cream or other contents are to be removed is preferably constructed of paper or similar material and the same is provided with a downwardly tapering conical body 22, an annular external flange 23 projecting laterally from the upper or free edge of the same, and a bottom 24 closing the lower end of the body.

For the purpose of discharging the contents from this container the latter is inverted and placed with its flange 23 on the shelf or shoulder 20 of the support 9, on which it is retained against lateral displacement by means of the retaining flange 21, as shown in Fig. 1, and while thus supported the bottom of the container is pushed downwardly toward the open end of the container into the position shown by full lines in Fig. 2, whereby the contents of the container are ejected downwardly into any suitable receptacle provided for this purpose.

In the preferred construction the diameter

of the opening 25 in the supporting ring 9 is equal to and preferably somewhat larger than the internal diameter of the container at the outlet end thereof, as shown in Fig. 2, so that when the contents of the container issue from the open end thereof the same will pass through the ring without practically any engagement therewith.

Means are provided for pushing the bottom of the container downwardly for ejecting the contents therefrom and means are also provided for holding the container against displacement on its support while such removal of the contents is accomplished, these means being preferably constructed as follows:—

The numeral 26 represents a vertically movable plunger arranged axially in line with the supporting ring 9 and adapted to engage with the bottom of the container on the exterior thereof. This plunger is mounted on the lower end of a vertically movable shifting rod 27 which latter is mounted on the overhanging upper head 11 of the main frame so as to guide the plunger in its movements toward and from the container support 9.

This vertical motion of the plunger and its shifting rod 27 may be accomplished by various means but in the preferred construction these means comprise a horizontal transverse rock shaft 28 which is journaled in a suitable bearing 29 on one wall of the frame head 11 which is made hollow, a front rock arm 30 projecting forwardly from the rock shaft and through an opening 31 in the front side of the frame head 11 and into a vertical slot or opening 32 in the adjacent part of the plunger shifting rod 27, and a handle or crank 33 secured to the rock shaft 28 on the exterior of the frame and adapted to be manipulated by hand. In the elevated position of the plunger, as shown in Fig. 1, the hand crank 33 is arranged in a substantially upright position and upon moving this crank forwardly and downwardly the front rock arm 30 of the rock shaft 28 causes the plunger 26 to be shifted from the position shown in Fig. 1 to the depressed position shown in Fig. 2.

At the same time that the plunger is depressed the carriage 18, upon which the container support 9 is mounted, is raised so as to permit of ejecting the contents from the container more rapidly and also reducing the extent of throw of the operating handle or crank 33 for this purpose. This is preferably accomplished by providing the rock shaft 28 with a rearwardly projecting rock arm 34 which is connected by means of a link 35 with the upper part of the carriage 18, as best shown in Fig. 2. It will be apparent that upon turning the rock shaft 28 so that its front arm 30 will depress the plunger 26, the rear rock arm 34 at this time will rise and thereby carry the container support 9 upwardly, thereby materially reducing the extent of throw of the hand lever or crank 33 for operating the machine and expediting the discharge of the contents from the container accordingly.

A reverse movement of the hand lever 33 will of course operate the parts so that the plunger 26 will be raised and the container support 9 will be lowered into the position shown in Fig. 1, thereby leaving the empty container exposed so that the same can be conveniently removed from the support 9, leaving the machine clear for the next operation.

The means whereby the container is held against displacement on the support 9 consists of a jaw 36 which is preferably of skeleton or open-work form and provided with a lower clamping ring 37 adapted to surround the body of the container and engage with the underside of the flange 23 of the reversed container, a shifting tube 7 surrounding the shifting rod 27 and guided in a vertical guideway 38 on the front part of the frame head 11 and connected at its lower end with the clamping jaw 36, and a spring 39 surrounding the upper part of the shifting rod 27 and bearing at its lower end against a shoulder 40 formed by the upper end of the shifting tube or hollow rod 7, while its upper end bears against a shoulder on the plunger shifting rod 27 which is formed thereon by means of a pin 41 passing therethrough.

The shifting tube is provided with a slot 42 in line with the slot 32 in the shifting rod 27, which slot 42 is traversed by the front arm 30 of the rock shaft 28. When the parts of the machine are open or retracted and in a position to receive a filled container from which the contents are to be discharged, the plunger and corresponding jaw are both elevated, as shown in Fig. 1, and the clamping jaw 36 bears with the shoulder or disk 43 at the lower end of the rod against the upper side of the plunger 26, the gripper being resiliently held in this position by the spring 39 which pushes downwardly on the upper end of the gripper shifting tube 7.

During the first part of the downward motion of the plunger, the clamping jaw 36 moves downwardly in unison therewith and the parts are so constructed that the lower edge of this gripping jaw engages with the upper side of the flange 23 on the container before the plunger 26 engages with the bottom thereof. After the gripper 36 has been engaged with the flange 23 of the container in this manner the plunger 26 continues its downward movement independently of the gripping jaw 36 while the latter remains at rest.

During the initial part of the downward motion of the plunger and container clamping jaw 36, the shifting rod 27 and shifting tube 7 are practically integral inasmuch as the spring 39 is subjected to an initial compression when the same is inserted between the shoulders 40 and 41. When, however, the

downward motion of the clamping jaw 36 is arrested by engagement with the flange 23 of the container and the plunger 26 continues its downward movement independently of the jaw 36, then the jaw 36 is pressed firmly against this flange of the container due to the increase of compression in the spring 39 which occurs at this time, whereby the flange of the container is firmly gripped at its open or normally upper end and held reliably in place so that the outlet of the container will not collapse or become displaced in any way, and thereby permit of subsequently discharging the contents of the container freely and completely therefrom through the opening in the support 9. The plunger 26 engages with the bottom of the container on the exterior thereof immediately after the flange of the container has been gripped by the jaw 36, which downward movement of the plunger is effected by the continued downward motion of the front rock arm 30 at this time.

The extent of this movement is such that the plunger 26 pushes the bottom of the container downwardly toward the open top thereof a sufficient distance to buckle or reverse the lower part of the container the required extent as will insure complete discharge of the contents from the container. The extent of such buckling, reversing or telescopic action of the plunger on the bottom and lower part of the wall or body of the container is represented by full lines in Fig. 2.

After the container has been thus emptied, a reverse motion of the rock shaft 28 will cause the plunger and gripper 36 to be raised to their elevated inoperative position and the container support 9 to be lowered so as to leave the crumpled or telescoped container freely exposed and permit the same to be easily removed and replaced by another full container.

This apparatus is very simple and compact in construction, the same can be very easily and quickly operated for discharging ice-cream and the like from cup-shaped containers of the kind now in common use for dispensing ice-cream and the like, and the several parts are capable of being easily cleaned so as to maintain the apparatus in a sanitary condition.

I claim as my invention:—

1. An apparatus of the character described, comprising a support adapted to be engaged by the upper side of a flange of the top edge of a cup shaped container, a gripper adapted to engage the under side of said flange, and a plunger adapted to engage the under side of the bottom of said container and push the same toward the top thereof for ejecting the contents of the container.

2. An apparatus of the character described, comprising a support adapted to be engaged by the upper side of a flange of the top edge of a cup shaped container, a gripper adapted to engage the under side of said flange, a plunger adapted to engage the under side of the bottom of said container and push the same toward the top thereof for ejecting the contents of the container, and means for moving support, gripper, and plunger axially relatively to one another.

3. An apparatus of the character described, comprising a support adapted to be engaged by the upper side of a flange of the top edge of a cup shaped container, a gripper adapted to engage the under side of said flange, a plunger adapted to engage the under side of the bottom of said container and push the same toward the top thereof for ejecting the contents of the container, and means for moving support, gripper, and plunger axially relatively to one another, comprising an inner shifting rod connected with said plunger, an outer shifting tube in which said inner rod slides and which is connected with said gripper, a slide carrying said support, and means operatively connecting said rod, tube and slide and causing said slide to rise while said rod and tube descend, and vice versa.

4. An apparatus of the character described, comprising a support for a cup-shaped container; and means for pushing the bottom of the container toward the top thereof including a plunger adapted to engage the exterior of said bottom; and means for moving said plunger axially of said container, comprising a shifting rod carrying said plunger, a rock-shaft, a rock arm arranged on said rock shaft and engaging said rod, and a handle connected with said rock shaft.

5. An apparatus of the character described, comprising supporting means adapted to engage with the open top of a cup-shaped container; a plunger adapted to engage the exterior of the bottom of the container; and means for moving said support and plunger toward and from each other.

6. An apparatus of the character described, comprising supporting means adapted to engage with the open top of a cup-shaped container; a plunger adapted to engage the exterior of the bottom of the container; and means for moving said support and plunger toward and from each other comprising a carriage on which said support is arranged, a shifting rod on which said plunger is arranged, a rock shaft, rock arms projecting from opposite sides of said rock shaft and one of them engaging said shifting rod, and a link connecting the other rock arm with said carriage

7. An apparatus of the character described, comprising a frame provided on its lower part with a vertical guideway and on its upper part with an overhanging head; a carriage sliding in said guideway; a supporting ring arranged on said carriage and adapted to be engaged by the open end of a cup-shaped container; a plunger adapted to engage the ex-

terior of the bottom of said container and push the same toward the top thereof; a vertically movable shifting rod carrying on its lower end said plunger and having its upper part slidable vertically on said head; a rock shaft journaled on said head; front and rear rock arms arranged on said shaft, said front arm being connected with said rod; and a link connecting said rear rock arm with said carriage.

8. An apparatus of the character described, comprising a support for engaging the externally flanged upper edge of a cup-shaped container; holding means for gripping said flange against said support; and plunger means for pushing the bottom of the container toward the open top thereof.

9. An apparatus of the character described, comprising a support for engaging the externally flanged, upper edge of a cup-shaped container; holding means for gripping said flange against said support; and plunger means for pushing the bottom of the container toward the open top thereof; said holding means including a gripping jaw adapted to surround said container and movable toward and from said support.

10. An apparatus of the character described, comprising a support for engaging the externally flanged, upper edge of a cup-shaped container; holding means for gripping said flange against said support; and plunger means for pushing the bottom of the container toward the open top thereof; said holding means including a gripping jaw movable toward and from said support, and a yielding connection between said holding means and said plunger means.

11. An apparatus of the character described, comprising a support for engaging the upper externally flanged edge of a cup-shaped container; a plunger for engaging the exterior of the bottom of said container and moving the same toward the open top thereof; a shifting rod carrying said plunger; a gripping jaw adapted to move toward and from said support for gripping said flange; a shifting tube connected with said jaw and receiving said rod; and means for moving said plunger and jaw together part of the time and moving said plunger independently of said jaw part of the time.

12. An apparatus of the character described, comprising a support for engaging the upper externally flanged edge of a cup-shaped container; a plunger for engaging the exterior of the bottom of said container and moving the same toward the open top thereof; a shifting rod carrying said plunger; a gripping jaw adapted to move toward and from said support for gripping said flange; a shifting tube connected with said jaw and receiving said rod; and means for moving said plunger and jaw together part of the time and moving said plunger independently of said jaw part of the time, comprising a rock arm extending through said shifting rod and shifting tube; and a spring interposed between shoulders on said rod and tube.

13. An apparatus of the character described, comprising a support for engaging the upper externally flanged edge of a cup-shaped container; a jaw movable toward and from said support for gripping and releasing said flange; a plunger for engaging the exterior of the bottom of said container and moving the same toward the open top thereof; a reciprocating shifting rod carrying said plunger; a reciprocating shifting tube surrounding the rod and carrying said jaw; and means for moving said rod and tube together part of the time and moving said rod independently of the tube part of the time.

In testimony whereof I hereby affix my signature.

WILLIAM J. BAYNES.