Jan. 31, 1928. 1,657,782

G. A. BERG

MILK BOTTLE DECAPPER

Filed May 18, 1925 2 Sheets-Sheet 1

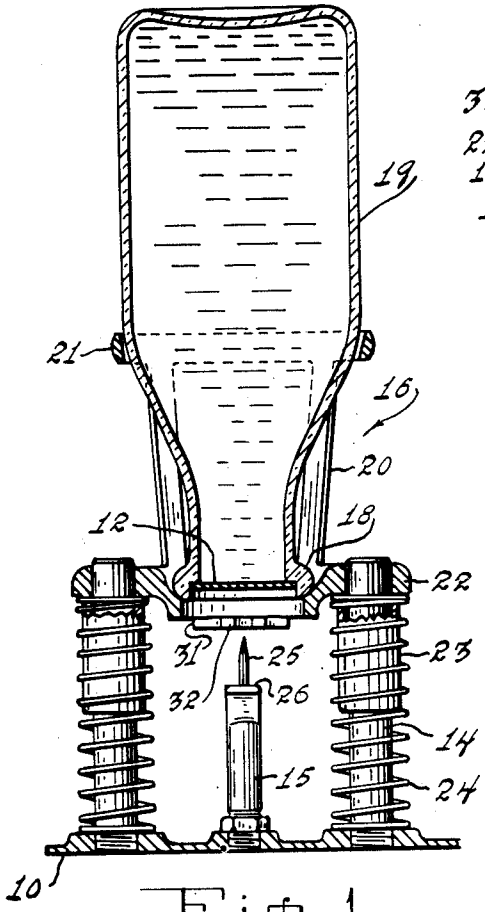

Fig. 1.

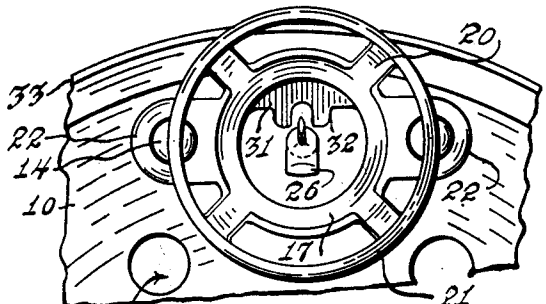

Fig. 2.

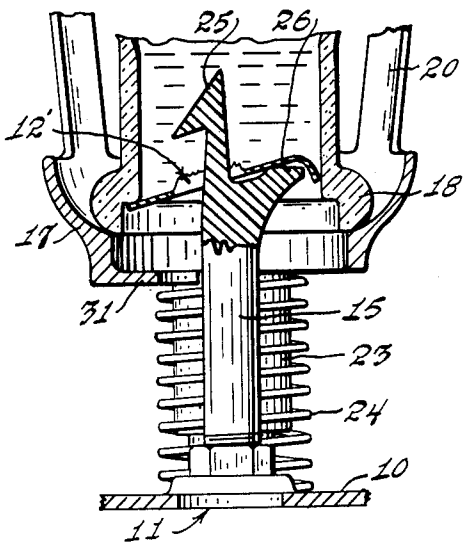

Fig. 3.

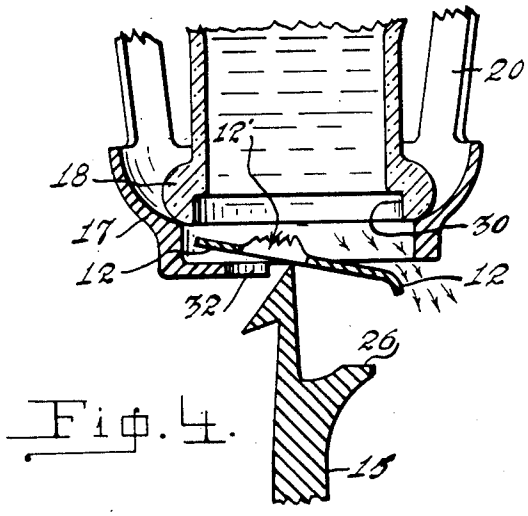

Fig. 4.

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MILK BOTTLE DECAPPER

Filed May 18, 1925 2 Sheets-Sheet 2

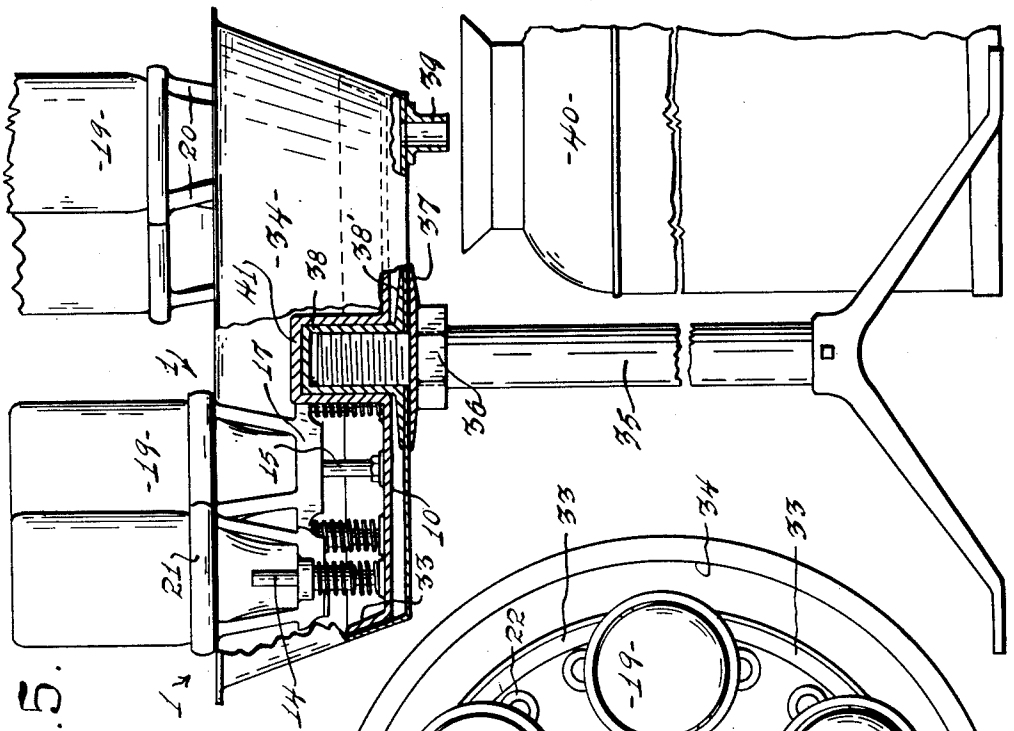

Fig. 5.

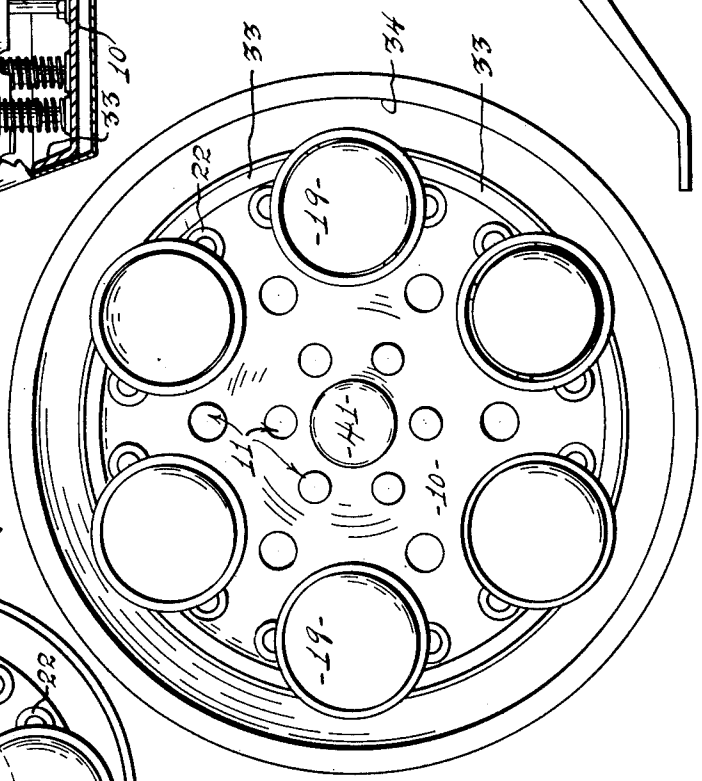

Fig. 6.

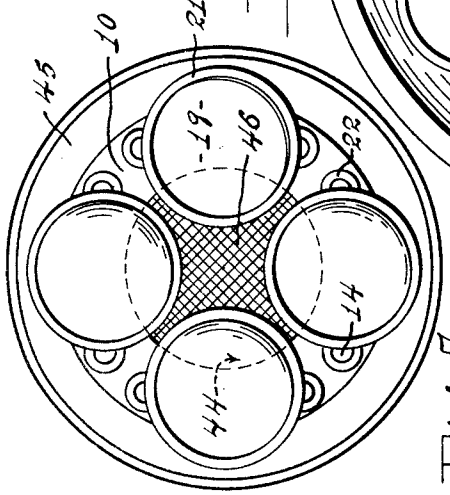

Fig. 7.

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Patented Jan. 31, 1928. 1,657,782

UNITED STATES PATENT OFFICE.

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MILK-BOTTLE DECAPPER.

Application filed May 18, 1925. Serial No. 31,122.

The present invention relates to method and means for pulling the stoppers from filled milk bottles to retrieve the contents thereof, and pertains more particularly to improvements in the machine set forth in the co-pending application of Berg and Howard, Serial No. 724,615, filed July 7, 1924.

One of the objects of this invention is to provide a simple and effective stopper pulling and bottle draining unit which is manually operable and such as may be grouped in multiples to provide machines of any desired capacity.

Another object of the invention is to provide more effective means for engaging and pulling a paper stopper from an inverted milk bottle.

Another object of the invention is to provide a multiple machine of the above described character which may be sold at a lower price to meet the demand for same in small dairies

In the machine set forth in the above mentioned application of Berg and Howard, the capacity is one complete case of bottles, whereas in many small dairies the total of returned milk bottles required to be emptied is so small comparatively as not to warrant the installation of such a machine. In the said machine a barbed spear is employed which upon being retracted withdraws the stopper with it. The force required to pull a stopper directly outward is such that occasionally a spear may tear through the paper without removing the stopper from the bottle. In a hand operated machine the said required force is objectionable, and it is therefore another object of the invention to provide means whereby less effort is required and whereby tendency of a spear head to pull through a stopper, without retracting it, is practically eliminated.

Another object of the invention is to provide a manually operated machine in which a single hand operation will serve to retract a stopper; whereas in the machine of Berg and Howard above mentioned, one stroke of the machine forces the spear through the stopper while another motion is required to retract the stopper.

Still another object of the invention is to provide a machine which can be taken apart hurriedly so that all parts may be separately sterilized.

Another object of the invention is to provide an improved spear which will function easily and efficiently so that the minimum of energy is required to empty a bottle.

Still other objects and advantages of the present invention will appear hereinafter and will be better understood because of the order in which they appear.

I have illustrated by the accompanying drawings a preferred embodiment of my invention and a modification thereof.

In the said drawings:—

Figure 1 is a view mainly in vertical section of a part of said embodiment; said part being hereinafter known as a unit and comprising all the parts necessary to unstopper and drain a single bottle at one time.

Figure 2 is a plan view of the parts shown in Fig. 1.

Figure 3 is a vertical section, full scale, of the principal parts of the unit shown in Figs. 1 and 2; the view being taken on a line at right angle to that on which Fig. 1 is seen and showing the parts in operation just before the stopper is withdrawn.

Figure 4 is an analogous view showing the parts in operative position just after a stopper has been withdrawn.

Figure 5 is a view mainly in elevation of a complete machine embodying several units.

Figure 6 is a plan view thereof.

Figure 7 is a plan view of a modified form of machine of lesser capacity.

More specifically, in carrying out the invention in any usual embodiment there is provided a base 10, which is of such character as to hold the respective parts about to be described, while being of such nature that the fluid falling thereon will readily drain therefrom. In this embodiment said base is accordingly provided with a plurality of openings or perforations 11, so that stoppers, such as 12, will be retained while the contents of the bottle may drain through; the act of holding the stoppers so that they are washed by the flowing milk being in conformance with the invention claimed in the said co-pending application. In the present invention it will be seen that still further provision is made for washing the stoppers.

A complete unit 1 also includes a pair of spaced studs 14, a central spear 15, and a bottle holding frame 16. The frame includes a bell-mouthed portion 17 adapted to receive the lip 18 of a milk bottle 19. In-

tegral with said portion a plurality of substantially vertical arms 20 are provided connecting with the upper bottle retaining ring 21. It will be seen that a bottle will become substantially centered in the holder and will be held loosely but permanently in upright position so that it may be drained of its entire contents.

The bottle holder includes two integral lugs 22, and from each lug a sleeve 23 depends. The lugs and sleeves are arranged so that they are slidable over respective studs. Springs 24, one for each sleeve, are placed between the base and the lug, encompassing the sleeve and stud. Thus the bottle holder is resiliently held above the spear, but is depressible to bring the lip or stopper of a closed bottle below the head 25 of the spear. When a bottle is placed in the holder and depressed, the springs are compressed, and thus energy is stored up to return the bottle to original position with sufficient force to accomplish the required results, as will be more clearly pointed out hereinafter.

One of the salient features of the invention resides in the spear. The head of the spear may be of any suitable design, but preferably it is so arranged that while it will penetrate the stopper, it will offer sufficient engagement with the stopper that an appreciable effort is required to withdraw it from the stopper, although it will be apparent hereinafter that such engagement is not depended upon, except in part, to pull the stopper out of the bottle.

Below the head of the spear, and to one side of the center thereof, there is provided a heel 26. Said heel is so arranged that it is non-coaxial of the bottle holder. The heel may be of any suitable construction, but for convenience it is an integral part of the spear. Its sole purpose is to poke the stopper into the bottle in substantially the manner depicted in Fig. 2, so that the edges of the stopper break engagement with the surface 30 of the bottle neck. Obviously, when a stopper is in a position shown in Fig. 3 it is more easily withdrawn, vertically downward, than would be the case of a stopper in the position in which it is shown in Fig. 1.

The bottle holder is provided with a stripper plate 31, having spaced tongues 32, arranged one to either side of the center so that when the holder is depressed the spear head may pass between the said spaced tongues.

Referring to Figs. 5 and 6, in conjunction with Figs. 1, 2. 3, and 4, the base, a part of which is shown in Figs. 1 and 2, is a circular perforated member surrounded by an upwardly ranging flange 33. Said base is shown as provided with a plurality of the units 1, arranged in an annular series. A non-perforated receptacle 34 is provided in which the base is adapted to revolve; said base in this case forming a revoluble perforated false bottom for the receptacle. The receptacle is in the form of a large milk pan and is supported by a standard 35. The standard is provided with a nut 36, having an integral flange 37 on which the receptacle rests. A cylindrical cap or bearing member 38 screws on to the standard above the pan and coacts with the flanged nut to hold the pan in fluid tight assembly on said standard. The pan is provided with a drain 39 whereby milk may flow from it into a milk can, such as 40.

The base includes an integral inverted cup 41 at the center, fitting over the bearing and revolving freely thereon. It will be seen now that the entire assembly of units, together with the base, may be revolved freely in the pan.

The operation of the parts will now be described, the operation of a single unit being first to be considered, and subsequently the operation of the complete embodiment shown in Fig. 5. To empty a bottle it is placed in the holder in which it becomes automatically centered with sufficient accuracy. By pressing down on the bottom of the bottle the bottle holder is depressed and the springs are compressed.

The act of placing a bottle in the holder and depressing same is all done in a single stroke. The bottle holder must be depressed to about the position shown in Fig. 3. As a result of such movement of the bottle relative to the spear, the latter is caused to penetrate the stopper, and the heel is caused to push the stopper in the oblique position shown in Fig. 3. It is a well known fact that when a bottle stopper is forced inwardly by a blunt object, such as the heel, applied to one side of the center, the engagement between the bottle and the stopper is quite effectively broken; in fact in some instances the outrush of milk will cause the stopper to be carried out of the bottle. However, even more frequently the stopper becomes slightly wedged in the position shown.

It is found, however, that the effort required to withdraw the stopper from the position in which it is shown in Fig. 3, is only a fractional part of the energy required to withdraw the stopper from the position in which it is shown in Fig. 1. Any normal friction between the spear and stopper will usually suffice to withdraw the stopper after it has been dislodged by the heel, but as an added assurance of efficient operation the spear is barbed as shown, or otherwise suitably shaped, so that it will quite positively engage the stopper.

Immediately the bottle is depressed it is released. The springs then act to return the

bottle holder to almost normal elevation. In raising the bottle, the relative retrograde movement of spear to bottle causes the stopper to be pulled from the neck of the bottle. The action of the stripper plate is to allow the spear head to pass while intercepting the stopper. Thus the stopper is stripped off and falls on to the perforated base.

Considering the operation of the machine as a whole, a bottle is placed in the holder and same is depressed and subsequently released, whereupon the stopper is removed as described, and the bottle is free to drain. The base is then turned a partial revolution to the right or left and a second bottle is placed in the next holder. The second bottle is accordingly unstoppered. One after another the bottles are inserted and unstoppered by succeeding units until the base has been turned a complete revolution. The more units contained on a base the longer it will take before the first bottle is reached. When the complete revolution is effected the first bottle will be found to be quite well drained. As the stoppers are stripped from the spears they fall on the base and are washed by the flow of milk draining from the bottles. As the base is turned there is a slight washing action of the base and stoppers through the milk and further agitation and rearrangement of the fallen stoppers is effected.

The machine is operable continuously, one drained bottle being removed and a filled bottle being placed in each successive unit as long as the machine is in use.

In the form of the invention shown in Fig. 7, the base is in the form of a large ring having a central large aperture 44. Said ring will hold a few of the units, but in the case of a few units, where one is as readily reached as another, the base need not be revoluble. In the embodiment now being described, the base is not revoluble, but fits removably in a common dairy type of milk strainer 45, having a fine meshed sieve bottom 46. Such strainers are adapted to fit over a large milk can of the type shown in Fig. 5. In the operation of this form, all the holders are filled and operated successively, and by the time the last bottle holder is used the bottle in the first one may be withdrawn.

In carrying out the invention the bases may be made either stationary or revoluble, as described, or any other suitable arrangement may be employed for progressively moving successive units away from the operator of the machine while simultaneously bringing the emptied bottles back to him; such arrangements including traveling conveyors and the like. The machines may of course be employed in conjunction with progressive bottle steaming, bottle washing and like apparatus, and while I have shown and described a specific embodiment of my invention, I do not limit myself to any specific construction or arrangement of parts, and I may alter the construction and use other arrangements of parts as I desire without enlarging the scope of my invention within the appended claims.

I claim:

1. In a device of the class described, a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, and a fixed stripper carried by said holder and aligned with said spear; said holder being depressible.

2. In a device of the class described, a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, a fixed stripper carried by said holder and aligned with said spear; said holder being depressible, and a spring to said depressible bottle holder to urge same upwardly from depressed position.

3. In a device of the class described, a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, a fixed stripper carried by said holder and aligned with said spear; said holder being depressible, and a blunt instrument fixed with regard to said spear and disposed to one side thereof whereby upon depression of said holder a stopper of a bottle carried by said holder will be abutted by said instrument after the spear has penetrated said stopper.

4. In a device of the class described, a perforated base and a plurality of bottle decapping units carried by said perforated base; each unit comprising a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, and a fixed stripper carried by said holder and aligned with said spear; said holder being depressible.

5. In a device of the class described, a perforated base and a plurality of bottle decapping units carried by said perforated base; each unit comprising a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, a fixed stripper carried by said holder and aligned with said spear; said holder being depressible, and a spring to said depressible bottle holder to urge same upwardly from depressed position.

6. In a device of the class described, a perforated base and a plurality of bottle decapping units carried by said perforated base; each unit comprising a holder for holding a bottle in inverted position, a fixed spear below said holder and aligned therewith, a fixed stripper carried by said holder and aligned with said spear; said holder being depressible, and a blunt instrument fixed with regard to said spear and disposed to one side thereof whereby upon depression of

said holder a stopper of a bottle carried by said holder will be abutted by said instrument after the spear has penetrated said stopper.

7. The device as in claim 4 and including a standard; said perforated base being revolubly mounted on said standard.

8. The device as in claim 5 and including a standard; said perforated base being revolubly mounted on said standard.

9. The device as in claim 6 and including a standard; said perforated base being revolubly mounted on said standard.

10. In a bottle decapping unit for machines of the class described, a bottle holder to retain a bottle in inverted position; said bottle holder having an upper open end for receipt of a bottle and a lower opening through which a stopper for such bottle may be retracted downwardly, a base plate; said bottle holder depressible relative to said base, means for guiding said depressible bottle holder, spring means to urge said holder from depressed position to normal position, and a spear carried by said base and disposed to pass relatively through the lower opening of said base when said holder is depressed.

11. The unit as in claim 10 and further including a spear stripper fixed to said holder adjacent to and below the center of said lower opening of said bottle holder.

12. In a device of the class described, a receptacle, a traveling member in said receptacle, a plurality of bottle decapping units fixed to said member; each unit including a bottle holder arranged to hold a bottle in inverted position, and further including means for withdrawing a stopper from such bottle while same is within the holder.

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