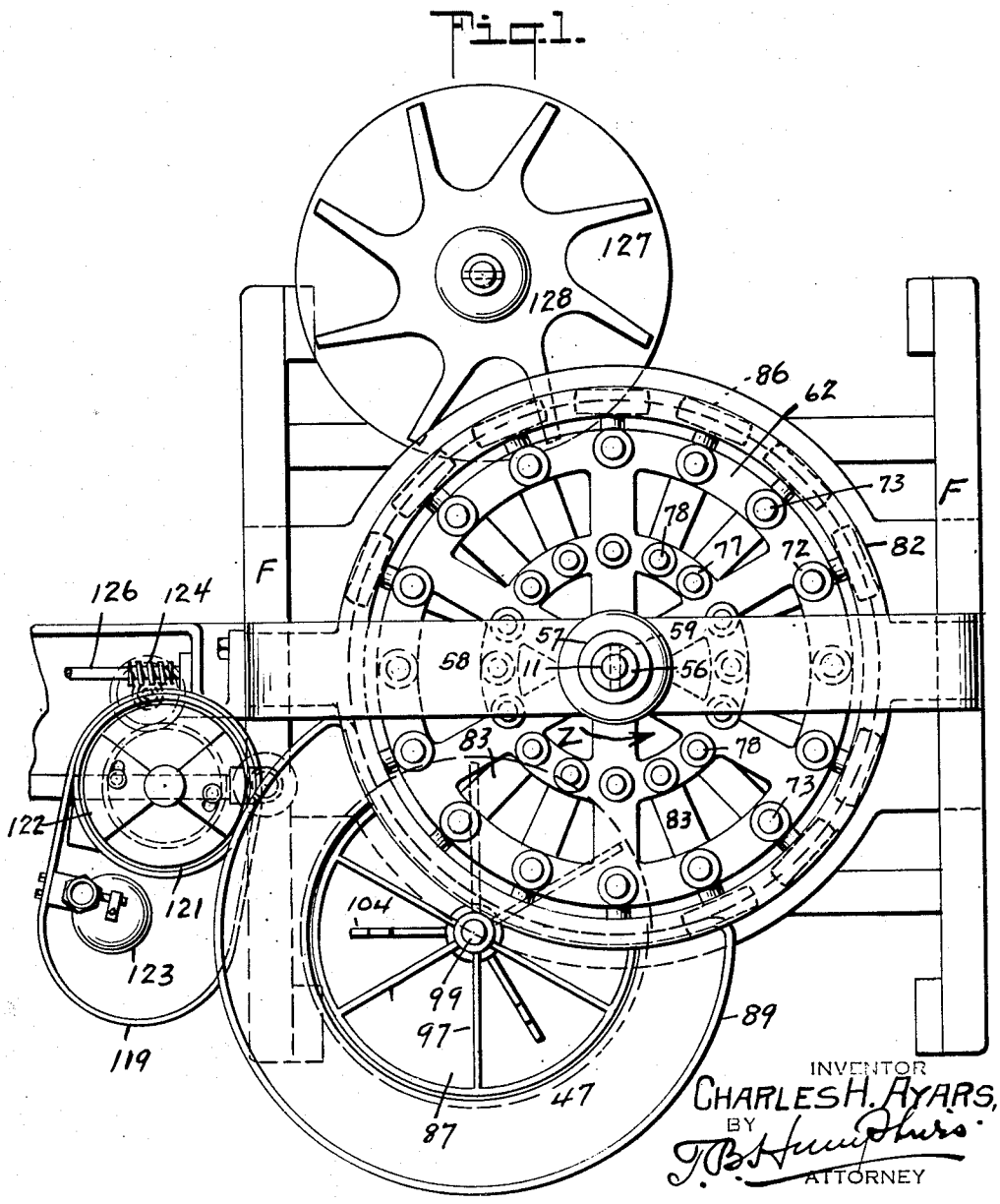
Oct. 17, 1939. C. H. AYARS 2,176,449

CAN FILLING MACHINE

Filed Aug. 1, 1938 4 Sheets-Sheet 1

Fig. 1.



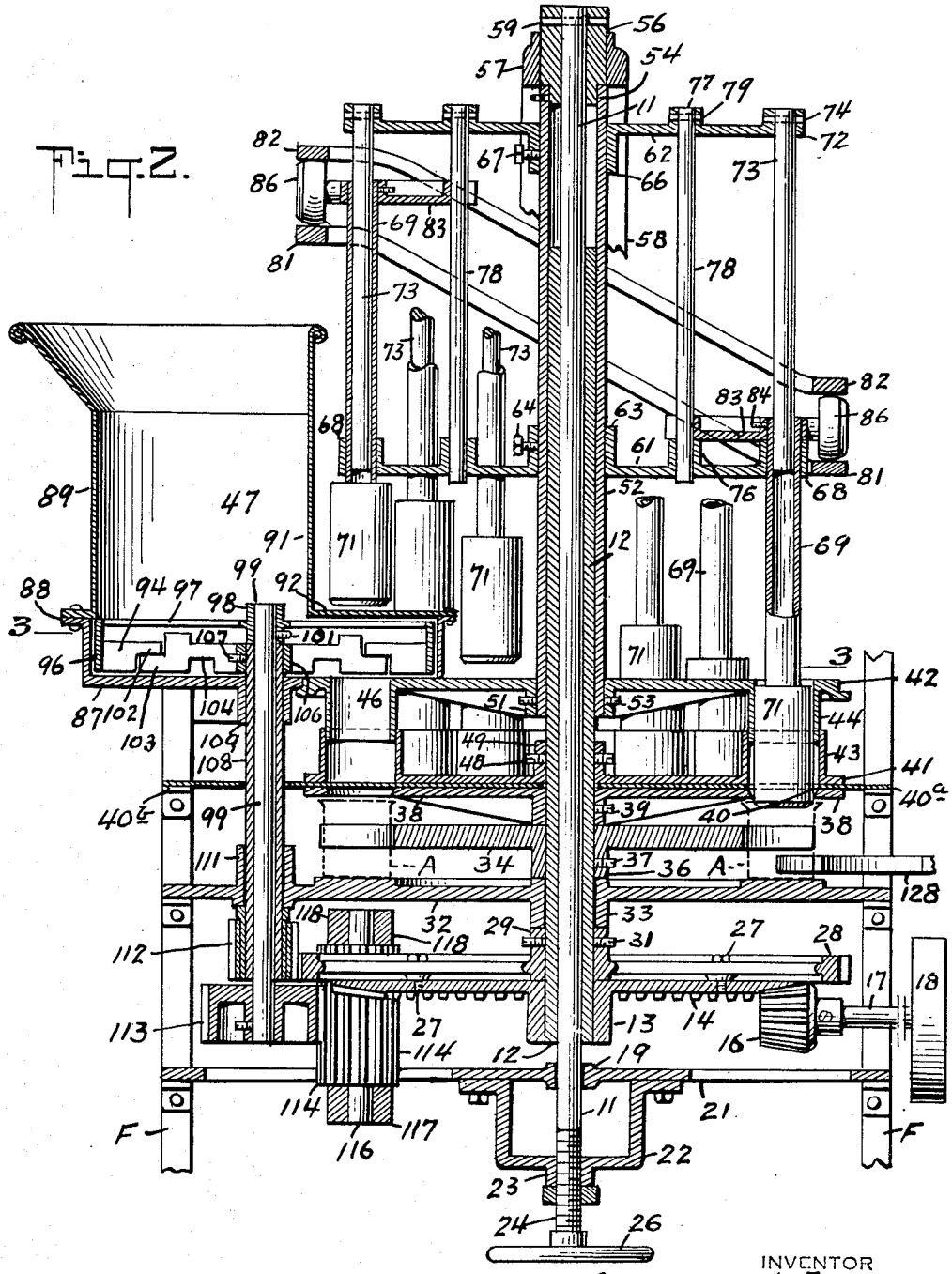

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CAN FILLING MACHINE

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Fig. 2.



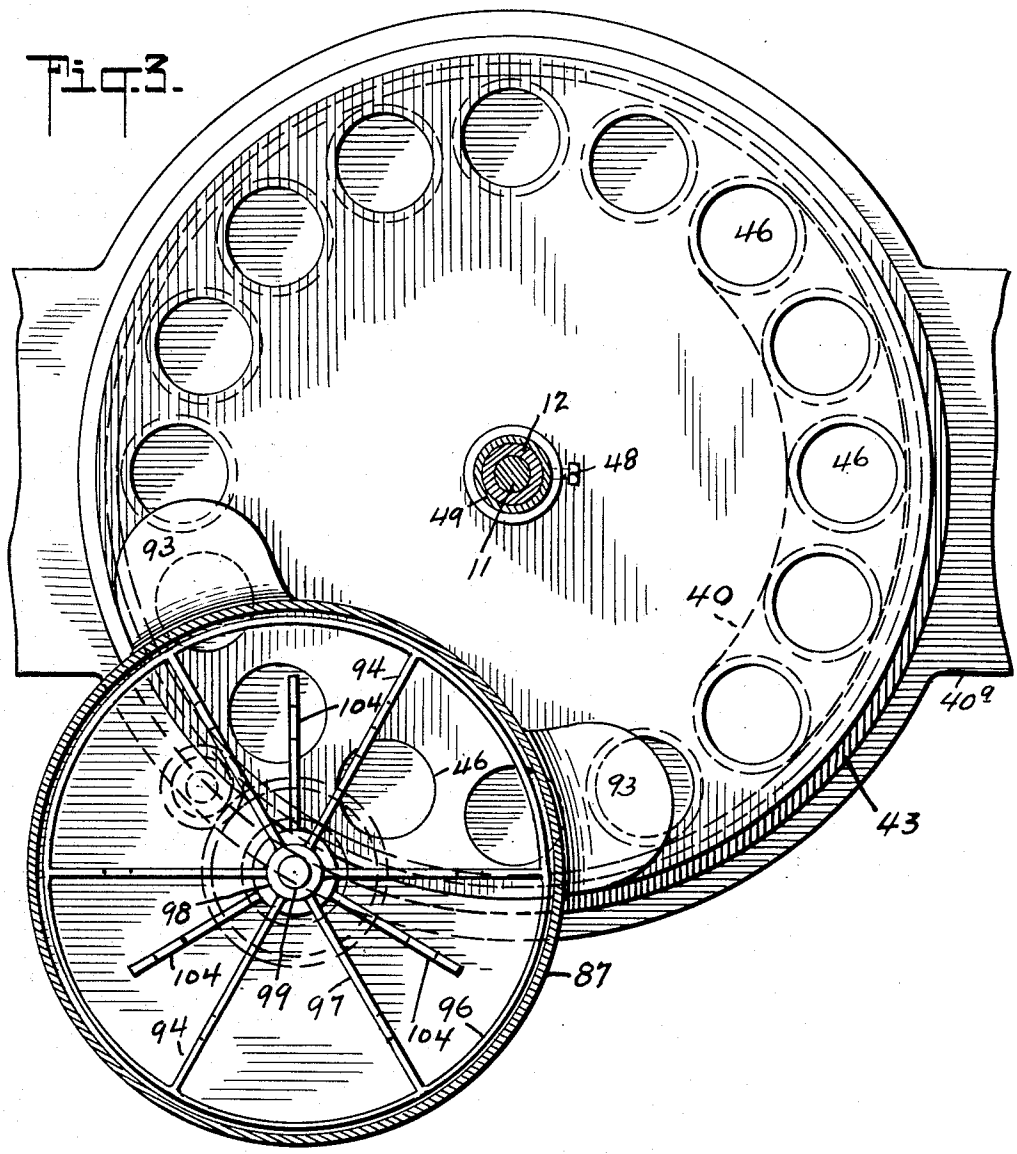

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Fig. 3.




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CAN FILLING MACHINE

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Fig-4.

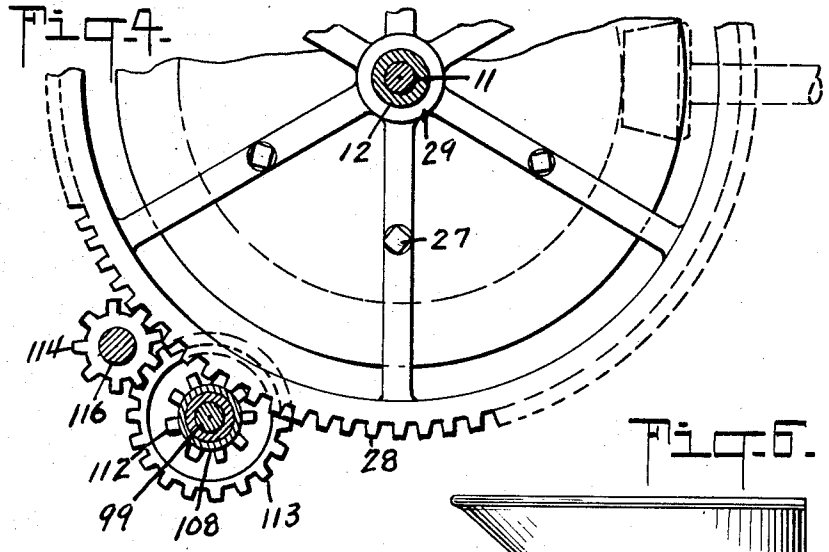



Fig-6.

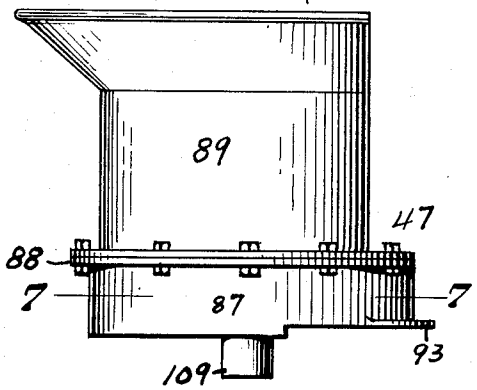



Fig-5.

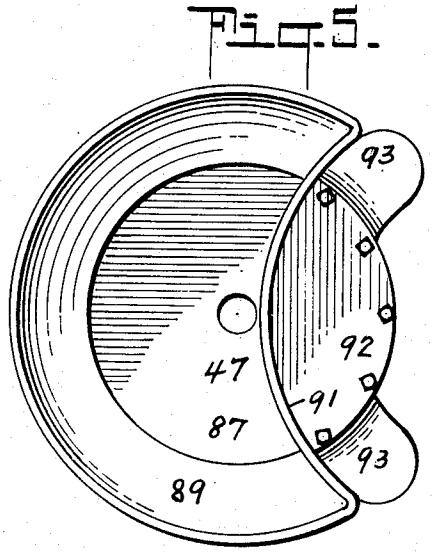
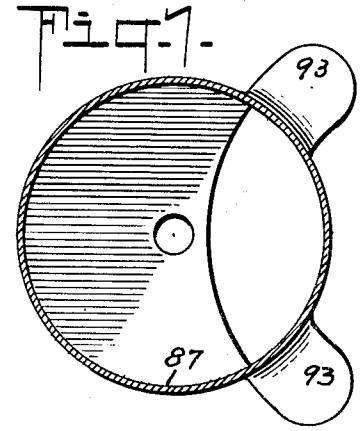



Fig-7.




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Patented Oct. 17, 1939 2,176,449

# UNITED STATES PATENT OFFICE

2,176,449

## CAN FILLING MACHINE

Charles H. Ayars, Salem, N. J., assignor to Ayars Machine Company, Salem, N. J., a corporation of New Jersey

Application August 1, 1938, Serial No. 222,426

30 Claims. (Cl. 226—96)

This invention relates to can filling machines, and has particular reference to a machine for filling cans with vegetables and the like of such consistency that the material does not readily fall by gravity from the cups into the cans, but must be mechanically assisted.

The object of the present invention is to provide a machine for filling cans with cut vegetables, broken grain corn and the like, which requires assistance from the source of supply into the measuring cups and from said measuring cups into the cans to be filled therefrom.

A further object of the invention is to provide a machine of the above type in which the cups are readily adjustable as to capacity, and in which cans of different size may be accurately filled.

According to the invention, the can filling machine is provided with a central rotating shaft, an upper and lower turret having telescoping members providing adjustable cups for measuring the material to be deposited in cans, a circular hopper member extending over a plurality of said open topped cups, and communicating therewith, means in said circular hopper member for wiping the material from said hopper into said cups, and plungers adapted to pass through said cups to eject the material from said cups into said cans, said plungers being adapted to be raised from said cups and to pass over said circular hopper member when their respective cups are being filled with material to be deposited. The plungers are provided with means for insuring alignment with their respective cups. The circular hopper member has a crescent shaped hopper body whose inner concave wall is of substantially the same radius as the peripheries of the turrets. The members for wiping the material from the circular hopper member into the adjustable pockets may comprise oppositely rotating blades operating at different speeds, and may be driven by gear mechanism associated with the mechanism for driving the shaft. The machine may be provided with means for elevating the cups, plungers and hopper without disturbing the lower part of the machine.

The drawings illustrate an embodiment of the invention, and the views therein are as follows:

Figure 1 is a top plan view of the machine with the can feeding mechanism broken away,

Figure 2 is a vertical sectional view of the same,

Figure 3 is a cross-sectional view on the line 3—3 of Figure 2,

Figure 4 is a small detail view showing the gear arrangement for driving the blades in the circular hopper member.

Figure 5 is a top plan view of the hopper showing the extensions for sealing the cups against excessive fill,

Figure 6 is an end view of the hopper, and

Figure 7 is a cross-sectional view taken on the line 7—7 of Figure 6.

As illustrated, the central shaft 11 has a lower sleeve 12, and to the lower part of this lower sleeve is a fixed hub 13 of a bevel gear 14. This bevel gear is meshed by a bevel pinion 16 on the shaft 17, which said shaft is provided with a pulley 18 belt driving the machine, but the shaft 17 may be driven by any other means desired. The bottom end of this shaft extends through a bearing 19 of a bracket 21, while affixed to this bracket is a stirrup 22 having a screw threaded hole 23 through which the screw 24 extends and abuts the lower end of said shaft 11. The screw 24 is provided with a hand wheel 26, the purpose of which is later explained.

The bevel gear 14 has affixed thereto by bolts 27 a ring gear 28 and the hub 29 of this ring gear is fastened to the sleeve 12 by set screws 31. Above the hub of the ring gear 28 is a table 32 for supporting cans "A" for filling, and this table may be held in the frame "F" either fixedly or adjustably. This table 32 has a hub member 33 surrounding the sleeve 12 and slidable thereon. Above the table 33 is a star wheel 34, which has a hub 36 secured to the sleeve 12 by set screws 37. Above the star wheel 34 is the pocket or turret plate 38, which is secured to the sleeve 12 by set screws 39, so that this plate also rotates with the star wheel 34, and with the cooperating lower and upper turret members 41 and 42 respectively.

These members have upward and downward depending circular flange members 43 and 44 respectively, the upper being adapted to slidably fit within the lower, so as to provide telescopic measuring cups 46 for receiving and measuring material from the hopper 47. The lower turret member 41 has set screws 48 in its upwardly extending central flange member 49, which said set screws engage the sleeve 12, whereby the said lower turret will rotate with said sleeve, and since the depending circular flange members 44 of the upper turret 42 are engaged within the upwardly extending flange members 43 of the lower turret 41, said upper turret will ipso facto rotate with the lower turret. The upper turret 42 has a depending flange 51 which is fastened to an outer sleeve 52 by set screws 53. This outer sleeve 52 extends upward to a point above the inner sleeve 12 and nearly to the top of the shaft 11, and fits over the reduced shoulder 54 of the plug

56 mounted in the bearing 57 of the arch 58 of the frame. The shaft 11 is secured to the plug 56 by means of the pin 59, so that said shaft, when rotated, will in turn rotate the sleeve 52.

Between the turret plate 38 and lower turret 41 is a sealing plate 40a which is secured to the frame "F" at 40b. This sealing plate has the usual elongated arcuate discharge slot 40, located at a position removed from where the circular hopper member 87 extends over the upper turret 42 for the purpose of permitting the descending plungers 71 to eject the material from the pockets 46 into the cans "A".

The sleeve 52 is provided with a lower bearing plate 61 and upper bearing plate 62, the former of which has its upwardly extending sleeve 63 secured to the sleeve 52 by set screws 64, while the upper plate has its depending sleeve 66 secured to the sleeve 52 by set screws 67, so that said bearing plates rotate with the shaft 11 and sleeve 52. The lower bearing plate has a series of concentrically located bearings 68 which house hollow plunger rods 69 secured to and extending up from the plungers 71. These bearings 68, hollow rods 69 and plungers 71 are, of course, equal in number to the measuring pockets 46, and are located accurately above the same.

The upper bearing bracket 62 has a plurality of outer housings 72 for securing the upper ends of rods 73 by means of pins 74. The lower ends of these rods extend within the hollow plunger rods 69, and in depth the full length of the bearings 68. The bearing plates 61 and 62 have inner rings of housings 76 and 77 which house rods 78 secured by means of pins 79. Mounted on the frame "F" is a track 81 which has a complementary depressing rail 82. Each radial pair of rods 78 and 69 has a bracket 83 which is slidably mounted on the rod 78 and secured to the upper end of the hollow plunger rod 69 by the set screw 84. Each of these brackets carry a roller 86 which operates between the track 81 and below the complementary depressing rail 82. These brackets, maintained positively radial by virtue of the rods 78 and 73 insure the plunger entering the pocket 46 on its downward stroke. The upper turret member 42 has a circular hopper member 87 cooperating therewith at one side of the machine. This circular hopper member is so arranged that it extends in part over a plurality of the open topped measuring cups 46. This hopper member is provided with an upper flange 88 to which is secured the hopper body 89. The hopper body here shown is substantially crescent shaped, and is provided with a concave wall 91 whose radius is substantially the same as the peripheral radius of the turret casting 42; the lower part of the wall 91 extending at right angles to form a cover 92 for that part of the circular hopper member 87 which extends over the turret. At each end of that part of the hopper member which extends over the open topped cups 46, are flat extensions 93 which cover the opening of the cups as the same pass thereunder to prevent material from the circular hopper member passing into the cups and out through the outside of said member. The circular hopper member 87 has a series of blades 94 mounted on an annular collar 96, the collar having ribs 97 fastened to a hub 98 which is secured to a shaft 99 by set screw 101. Figure 3 shows six of the blades 94. The blade has an upper overhanging part 102 under which the underslung parts 103 of the blades 104 pass, and these latter blades are secured on a collar 106, and fastened by a set screw 107 to a sleeve 108 fitting slidably around the shaft 99. The bottom of the circular hopper member 87 provides a bearing 109 for the shaft 99 and sleeve 108, while a bearing 111 in the can supporting plate 32 also houses these members which extend downwardly therefrom, the sleeve 108 being provided with an elongated gear 112 meshing with the gear 28.

The bottom of the shaft 99 is provided with a gear 113 which meshes with an elongated gear 114 mounted on a shaft 116 in brackets 117 and 118, and secured by any suitable means to the frame of the machine. The gear 114 also meshes with the gear 28 so that motion is imparted from the gear 28 through the gear 114 to the gear 113 fastened to the shaft 99 whereby the outer blades 94 are rotated. The inner blades 104 secured to the sleeve 108 are rotated by virtue of the ring gear 28 meshing with the gear 112 secured on said sleeve 108. By this means, the blades 104 which, as shown in Figure 3, are three in number, will rotate in a direction opposite to the direction of rotation of the blades 94 and at considerable greater speed.

In Figure 1 there is shown a liquid dispensing device 119, the pot 121 having the rotating part 122 is identical with the liquid dispensing device shown and described in my co-pending United States application Serial No. 110,053, filed November 10, 1936. In the machine herein, this device has been placed in a larger tank equipped with a float valve 123. The rotary measuring element 122 is rotated from a worm 124 on the feed shaft 126.

In this machine, I have deemed it unnecessary to show a can feeding device, but a can feeding device, such as that shown in my co-pending United States application Serial No. 188,825, filed February 5, 1938, may be employed.

It is also my intention to equip this machine with a "no can, no fill" device, and this device may be incorporated to switch the roller 86 at its high position, such as shown to the right in Figure 2, when the can which is to be filled by the plunger cooperating with the particular roller is missing from the feed device. This will require slight modification from the design which is explained in the co-pending application last referred to.

In the operation of the apparatus herein described, the shaft 17, being rotated from any suitable source of power, such for instance as the pulley 18, the bevel gear 16 will drive the bevel faced gear 14, and since the ring gear 28 is fastened to said face gear, and also fastened to the sleeve 12, the bevel gear 28 and sleeve 12 will be rotated. The rotation of the sleeve 12 rotates the star wheel 34 which moves the cans on the table 32 keeping them aligned with the bottoms of the pockets 46.

Assuming that the turrets 41 and 42 have been adjusted to provide the proper capacity in the cups 46, these pockets pass under the circular hopper member 87 which has the oppositely rotating blades 94 and 104 therein, so that the material from said hopper is swept or wiped into the pockets 46 by virtue of these blades. The turret members, of course, move in unison with the star wheel 34, and the turret base plate 38, so that the outer sleeve 52 is rotated, and the rollers 86 on the track 81 and depressing rail 82 operate the plungers to raise them above the extension on the circular hopper member 87 when passing over the same, and are lowered to eject the material from the pockets through the dis-

charge opennig 40 in the sealing plate 40a and into the cans "A".

The machine operates in the direction of the arrow "Z", Figure 1, and the cans are removed from beneath the turrets onto the table 127 by means of the star wheel 128 from which table they are taken to be capped.

Of course the filling machine illustrated and described herein may be modified in various ways without departing from the invention herein set forth and hereafter claimed.

The invention is hereby claimed as follows:

1. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, and means in said chamber for wiping material from said hopper into said cups.

2. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, means in said chamber for wiping material from said hopper into said cups, and means for expelling the material from said cups into receptacles.

3. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, and rotary means in said chamber for wiping material from said hopper into said cups.

4. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, rotary means in said chamber for wiping material from said hopper into said cups, and means for expelling the material from said cups into receptacles.

5. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, and rotary means having its axis parallel with the axis of rotation of said cups in said chamber for wiping material from said hopper into said cups.

6. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, rotary means having its axis parallel with the axis of rotation of said cups in said chamber for wiping material from said hopper into said cups, and means for expelling the material from said cups into receptacles.

7. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a chamber extending in part over a plurality of said open top cups, rotary means in said chamber for wiping material from said hopper into said cups, and means for expelling said material from said cups into cans.

8. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a chamber extending in part over a plurality of said open top cups, rotary means in said chamber for wiping material from said hopper into said cups, and reciprocating plungers for expelling said material from said cups into cans.

9. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, and oppositely rotating blades in said chamber for wiping material from said hopper into said cups.

10. A receptacle filling machine having rotary open top measuring cups, a hopper for supplying material to said cups for deposit into receptacles, said hopper having a chamber extending in part over a plurality of said cups, oppositely rotating blades in said chamber for wiping material from said hopper into said cups, and means for expelling the material from said cups into receptacles.

11. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, rotary means in said circular chamber for wiping material from said hopper into said cups, and means for expelling said material from said cups into cans.

12. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, rotary means in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers for expelling said material from said cups into cans.

13. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, oppositely rotating means in said circular chamber for wiping material from said hopper into said cups, and means for expelling said material from said cups into cans.

14. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, oppositely rotating means in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers for expelling said material from said cups into cans.

15. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, oppositely rotating blades in said circular chamber for wiping material from said hopper into said cups, and means for expelling said material from said cups into cans.

16. A can filling machine having a central shaft, turrets having open top telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, oppositely rotating blades in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers for expelling said material from said cups into cans.

17. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

18. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, means rotating in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

19. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, blades rotating in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

20. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, blades rotating in opposite directions in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

21. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans, and means for keeping said plungers aligned with their respective cups.

22. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, means rotating in said circular chamber for wiping material from said hopper into said cans, reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans, and means for keeping said plungers aligned with their respective cups.

23. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, blades rotating at different speeds in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

24. A can filling machine having a central shaft, turrets having telescoping cups, means associated with said shaft for regulating the capacity of said cups, a hopper for material to be deposited into cans, said hopper having a circular bottom chamber extending in part over a plurality of said open top cups, said extended part having a cover, blades rotating in opposite directions and at different speeds in said circular chamber for wiping material from said hopper into said cups, and reciprocating plungers adapted to be raised to pass over said extended part of said circular chamber and lowered to expel said material from said cups into cans.

25. A can filling machine comprising a turret having a plurality of open top measuring cups, a hopper having a part extending over a plurality of said cups for taking charges of material to be deposited in cans, plungers adapted to eject the material from said cups, and to pass over said extended part when said cups are being filled, and means for keeping said plungers aligned with their respective cups.

26. A can filling machine comprising a turret having a plurality of open top measuring cups, a hopper having a part extending over a plurality of said cups for taking charges of material to be deposited in cans, plungers adapted to eject the material from said cups, and to pass over said extended part when said cups are being filled, and a bracket for each plunger slidably mounted on a pair of rods for keeping said plungers aligned with their respective cups.

27. A can filling machine comprising a turret having a plurality of open top measuring cups, a hopper having a part extending over a plurality of said cups for taking charges of material to be deposited in cans, plungers adapted to eject the material from said cups, and to pass over said extended part when said cups are being filled, said plungers each having a sleeve slidably mounted on a rod, and a bracket fixed on said sleeve and slidably mounted on another rod for keeping the plungers aligned with their respective cups.

28. In a can filling machine having a turret

with adjustable measuring cups and means for revolving same, a stationary hopper having a circular bottom chamber extending over a plurality of said cups, blades in said circular chamber for wiping material into said cups, and gear mechanism driven by said turret revolving means for driving said blades in opposite directions.

29. In a can filling machine having a turret with adjustable measuring cups and means for revolving same, a stationary hopper having a circular bottom chamber extending over a plurality of said cups, blades in said circular chamber for wiping material into said cups, and gear mechanism driven by said turret revolving means for driving said blades in opposite directions, said hopper and blades being movable vertically without disconnecting said blade driving mechanism.

30. A can filling machine comprising a rotary turret having open top measuring cups, a stationary circular hopper member extending in part over a plurality of said cups for filling same, means for ejecting the material from said cups, and a wing extending outward from each side of said hopper for covering the cup passing to and the cup passing from said hopper to prevent material from the hopper from overflowing said cups.

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