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CAN FILLING MACHINE

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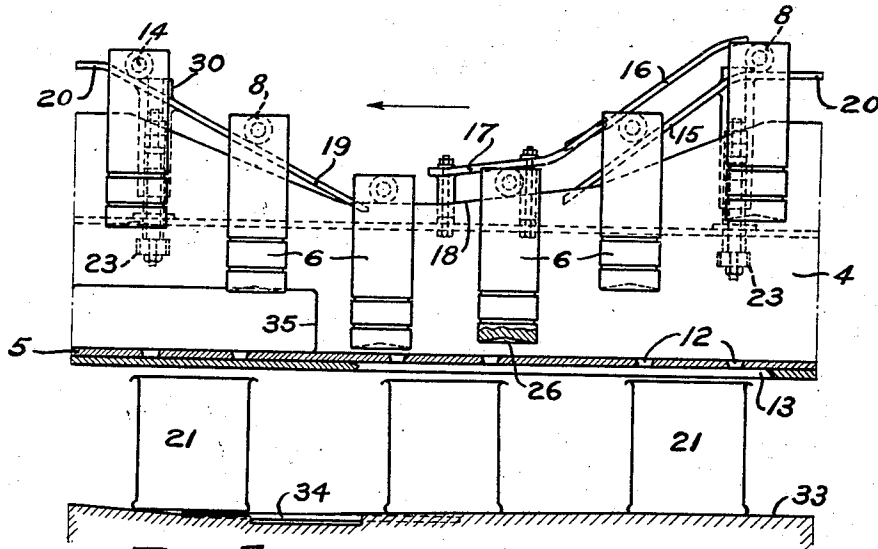


FIG. 3.

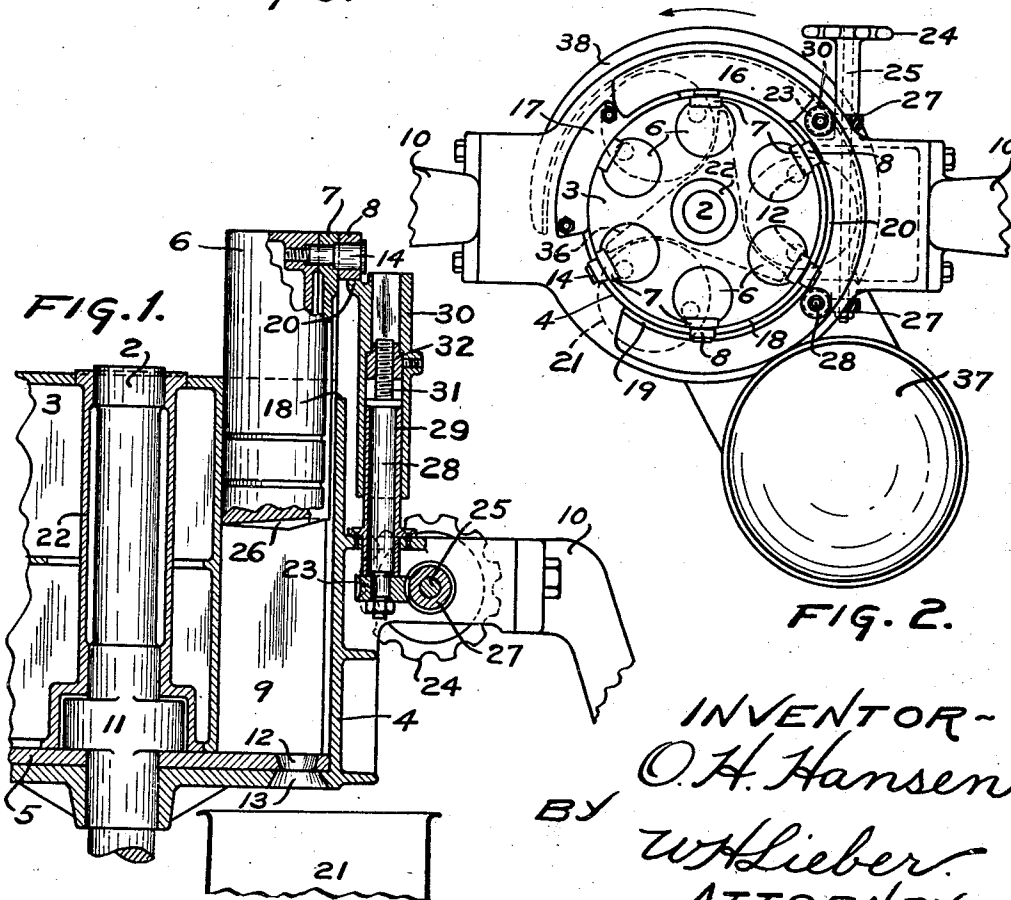


FIG. 2.

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CAN-FILLING MACHINE

Application filed August 9, 1926. Serial No. 127,986.

This invention relates to improvements in the construction and operation of machines for automatically measuring and for placing measured batches of fluent substances into successive receptacles while they are transported in series through the machine.

An object of the invention is to provide an improved can filling machine which is simple in construction and efficient in operation. Another object of the invention is to provide a new and useful machine especially adapted to automatically fill or partially fill receptacles having relatively large volume, such as gallon cans. A further object of the invention is to provide improvements in can filling machines of the type disclosed in copending application Serial Number 68,511, filed November 12, 1925, whereby such machines may be utilized to effectively pack materials into cans of the larger sizes. Still another object of the invention is to provide an extremely compact gallon can filler or similar structure, having maximum capacity and occupying minimum floor space. These and other objects and advantages of the invention will appear from the following description.

Some of the novel features of can filling machinery, illustrated but not specifically claimed herein, form the subject matter of copending applications Serial No. 634,196, filed April 23, 1923; Serial No. 9,466, filed February 16, 1925; and Serial No. 68,511, filed November 12, 1925.

A clear conception of an embodiment of the invention and of the mode of operation of devices constructed in accordance therewith, may be had by referring to the drawing accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a fragmentary central vertical section through an improved can filling machine which is especially adapted to fill or partially fill cans with measured batches of fluent material or substances.

Fig. 2 is a top view of the material supply and measuring mechanism of the improved can filling machine shown in Fig. 1.

Fig. 3 is a development of the material measuring mechanism showing the measuring and discharge plungers in various positions of adjustment.

The improved gallon filler specifically illustrated in the drawing, comprises in general a stationary hopper 37 constituting a source of material supply; a stationary cup-shaped casing 4 having a side inlet opening 35 and a bottom discharge opening 13 therein; a pocket element 3 rotatably supported within the casing 4 and forming an annular series of six vertical substantially cylindrical measuring pockets 9; a displacement plunger 6 vertically reciprocable within each of the measuring pockets 9; a central vertical rotary drive shaft 2 for simultaneously revolving all of the pockets 9 and the plungers 6 about the central vertical axis of the casing 4; suitable can supply mechanism of well known construction for delivering the empty gallon cans 21 to the machine; a series of three can hooks 36 operable by the shaft 2 and a can guide 38 cooperating therewith to transport the cans 21 successively through the machine beneath the pockets 9; a can discharge disk 34 for delivering the filled cans 21 from the machine; driving mechanism of well known construction for rotating the shaft 2 and for simultaneously actuating the can supply and discharge mechanisms; and stationary frames 10, 33 for supporting the material measuring and feeding devices and the can transferring mechanisms.

The supply hopper 37 may be located laterally adjacent to the casing 4 and above the measuring chambers of the pockets 9 so that the fluent material will be delivered by gravity through the side inlet opening 35 to each of the successive pockets 9 without introducing air into the measuring chambers. The stationary casing 4 provides a support for the drive shaft 2 and has a continuous annular outer wall the upper extremity of which constitutes a fixed roller track 18. The rotary pocket element 3 comprises an annular outer portion forming the measuring pockets 9, a central sleeve member 22 rigidly attached to the outer portion and having a lower recess directly engaging an elongated

driving block 11 formed integral with the shaft 2, and a cut-off plate 5 rigidly attached to the lower end of the outer portion and of the sleeve member 22 and having an annular series of discharge orifices 12 disposed beneath the outermost portions of the pockets 9. The orifices 12 are adapted to travel in succession over the discharge opening 13, and the pockets 9 have open sides successively communicable with the common inlet opening 35.

Each of the plungers 6 comprises a body snugly fitting the corresponding pocket 9, and a removable slide 7 fitting the inner cylindrical surface of the casing 4 and coacting with the opposite sides of the lateral openings in the pocket 9 to prevent the plunger body from rotating in the pocket. The slides 7 are detachably associated with the plunger bodies by means of pins 14 which rotatably support the plunger actuating rollers 8. The lower extremities of the plungers 6 may be provided with depressions 26 providing concavities above the discharge orifices 12 which tend to force all of the confined material directly toward the outlets.

Cooperating with the fixed track 18 at the top of the casing 4, are vertically adjustable tracks 15, 16, 19, 20 and a removable but normally stationary guide rail 17. The lower horizontal and inclined track sections 20, 15, 19 are formed integral and cooperate with portions of the fixed track 18 to gradually conduct the successive rollers 8 thereon and therefrom irrespective of the position of adjustment of the movable tracks. The upper inclined track section 16 is adjustable simultaneously with the lower adjustable sections, and cooperates with the rail 17 to urge the successive plungers 6 downwardly within the pockets 9. The track sections 15, 16, 19, 20 are secured to vertically movable sleeves 30 which embrace stationary sleeves 29 rigidly attached to the frame 10. Threaded blocks 32 secured within the movable sleeves 30, coact with the screw threaded upper ends 31 of upright rods 28 which are rotatably supported within and upon the fixed sleeves 29 by means of integral flanges coacting with the upper extremities of the sleeves 29. A gear 23 secured to the lower end of each rod 28, meshes with a cooperating gear 27 secured to a cross-shaft 25 journaled in the frame 10. The cross-shaft 25 is rotatable by means of a hand wheel 24 to simultaneously rotate the two sets of gears 27, 23 and to vertically adjust both sleeves 30.

The can hooks 36 are rotatably supported by the vertical main shaft 2, beneath the pockets 9 and above the can supporting frame 33. The number of can hooks 36 is only one half of the number of pockets 9, and each can hook is so disposed that it will always transport one can beneath and in vertical alinement with two of the discharge orifices 12 as shown in Figs. 2

and 3. The can supply, discharge and the driving mechanisms are of well known construction and form no specific part of the present invention.

During normal operation of the filler, the supply hopper 37 is provided with fluent material and the machine is set in motion to cause the pocket element 3 to rotate and to simultaneously cause the can hooks 36 to transport the successive cans 21 beneath the revolving pockets 9. As the pockets 9 advance, they are successively placed in communication with the supply hopper 37 through the side inlet opening 35 of the casing 4 whereupon the rising plunger 6 therein draw material into the measuring chambers. When the successive pockets 9 have been thus filled with measured batches of the material, they are cut off from the source of supply and are subsequently brought into communication through their discharge orifices 12, with the delivery opening 13 of the casing 4. The plungers 6 are then forced downwardly by the track 16 and the rail 17 and the measured batches of material from two of the successive pockets 9 are delivered into each of the successive cans 21. By manipulation of the hand wheel 24 and consequent adjustment of the stroke of the plungers 6, the sum of the volumes of two measured batches of the material may be made exactly equal to the volume of the portion of each can 21 which it is desired to fill. This adjustment may be effected without interrupting the normal operation of the machine.

By utilizing more than one measuring pocket 9 and plunger 6 to fill each of the successive cans 21, the pockets 9 may be made of relatively small diameter and may be brought close to the axis of revolution, thereby eliminating detrimental effects due to the action of centrifugal force upon the material when operating at high speed, reducing to a minimum the floor space occupied by the machine and producing an extremely compact structure. The use of relatively small pockets also permits reduction of the can circle to minimum diameter while maintaining the delivery openings at the portions of the pockets which are farthest from the axis of the filler, thereby permitting operation of the machine at maximum speed. With the smaller pockets 9 and plungers 6 the overhang of the rollers 8 is also reduced to a minimum, thereby permitting more effective reciprocation of the plungers without buckling due to tilting thereof within the pockets. The smaller plungers 6 also enable the manufacturer to use the same size plunger in machines for filling small and large cans, thereby reducing the cost of manufacture, and devices constructed in accordance with the present invention have proven highly successful in commercial operation.

It should be understood that it is not desired to limit the invention to the exact details

of construction and operation herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:—

1. In combination, means forming a single annular series of measuring pockets each having an outlet, means for revolving said pockets about an axis, means for supplying the same kind of material to all of said pockets, means for transporting receptacles in succession about the same axis so that each receptacle is exposed directly to the outlet of several of said pockets, and means for delivering the contents of said pockets to said receptacles through said outlets.

2. In combination, means forming a single annular series of measuring pockets each having an outlet at the lower end thereof, means for supplying like material to all of said pockets, means for revolving said pockets about a vertical axis, means for simultaneously revolving a series of receptacles beneath said pockets so that each receptacle is communicable directly with the outlets of several of said pockets, and means for delivering the contents of said pockets to said receptacles through said outlets.

3. In combination, means forming a single series of measuring pockets each having an outlet, means for supplying like material to all of said pockets, means for positioning a series of receptacles so that each receptacle has its filling opening alined with the outlets of several of said pockets, means for simultaneously moving said pockets and said receptacles at the same speed, and means for delivering the contents of said pockets to said receptacles through said outlets.

4. In combination, means forming a single annular series of measuring pockets each having an outlet, means for supplying like material to all of said pockets, means for positioning a series of receptacles so that each receptacle has its filling opening alined with the outlets of two adjacent pockets of said series, means for revolving said pockets and said receptacles about a common axis and at the same speed, and means for delivering the contents of said pockets to said receptacles through said outlets while in motion.

5. In combination, means forming a single annular series of measuring pockets each having an outlet at the lower end thereof, means for supplying like material to all of said pockets, means for positioning a series of open ended receptacles beneath said pockets so that the opening of each receptacle spans the outlets of two adjacent pockets of said series, means for simultaneously revolving said pockets and said receptacles about a common vertical axis, and means for delivering the contents of two of said pockets to each receptacle through said outlets.

6. In combination, means forming a single series of substantially cylindrical measuring pockets each having an outlet at an end thereof disposed eccentrically with respect to the pocket axis, means for supplying like material to all of said pockets, means for positioning open ended receptacles so that the opening of each receptacle spans the outlets of at least two adjacent pockets of said series, and means for delivering the contents of at least two of said pockets to each of said receptacles through said outlets.

7. In combination, means forming a single annular series of substantially cylindrical measuring pockets each having an outlet at an end thereof disposed eccentrically with respect to the pocket axis and on the side of said axis remote from the axis of annularity of said series, means for supplying like material to all of said pockets, means for positioning open ended receptacles so that the opening of each is communicable with at least two of said pocket outlets, and means for delivering the contents of at least two of said pockets to each of said receptacles through said outlets.

8. In combination, means forming a single annular series of substantially cylindrical measuring pockets each having an outlet disposed eccentrically relative to the pocket axis, all of said outlets being located outside of the common circle of the pocket axes, means for supplying like material to all of said pockets, means for positioning receptacles so that each receptacle has its filling opening communicable with at least two of said outlets, and means for delivering the contents of at least two of said pockets to each of the successive receptacles through said outlets.

In testimony whereof, the signature of the inventor is affixed hereto.

OSWALD H. HANSEN.