March 12, 1957 S. M. SILVER 2,784,746

PACKAGE FILLING APPARATUS AND METHOD

Filed Nov. 22, 1952 2 Sheets-Sheet 1

FIG. 1

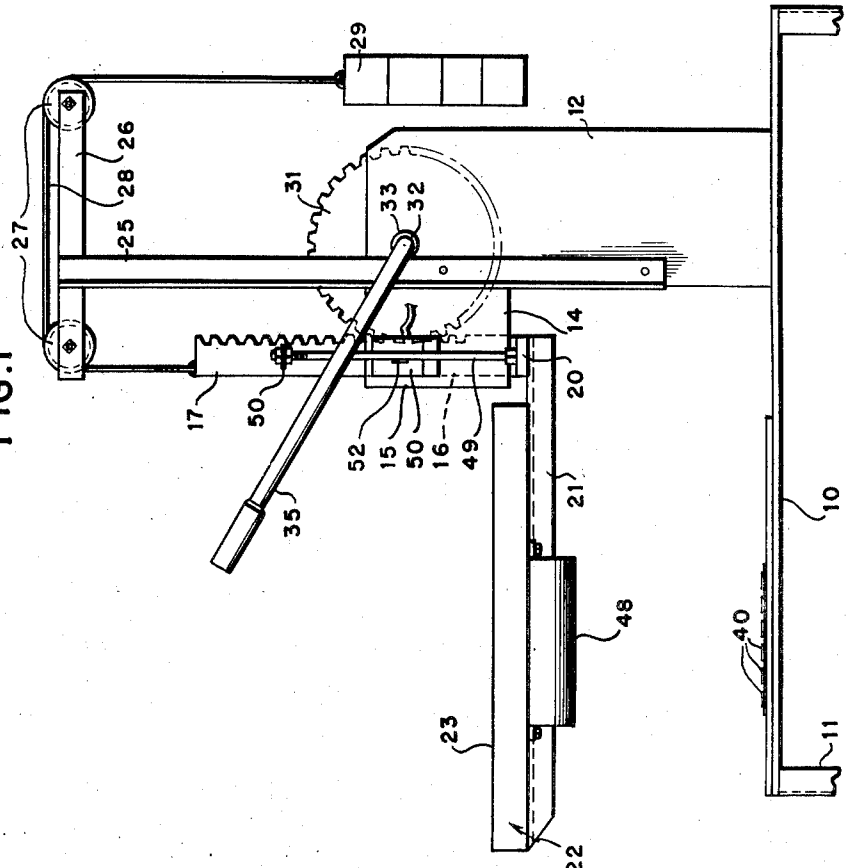
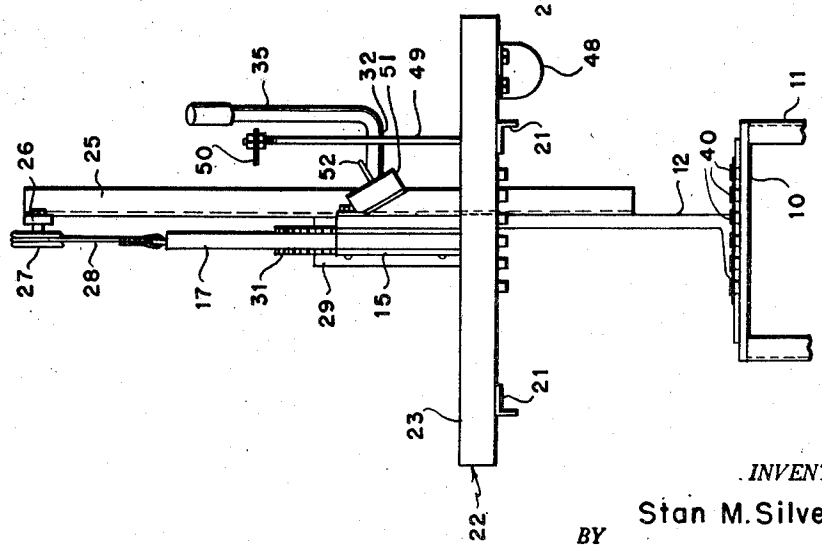


FIG. 2



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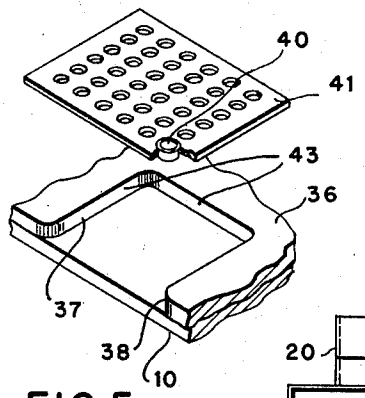


FIG.5

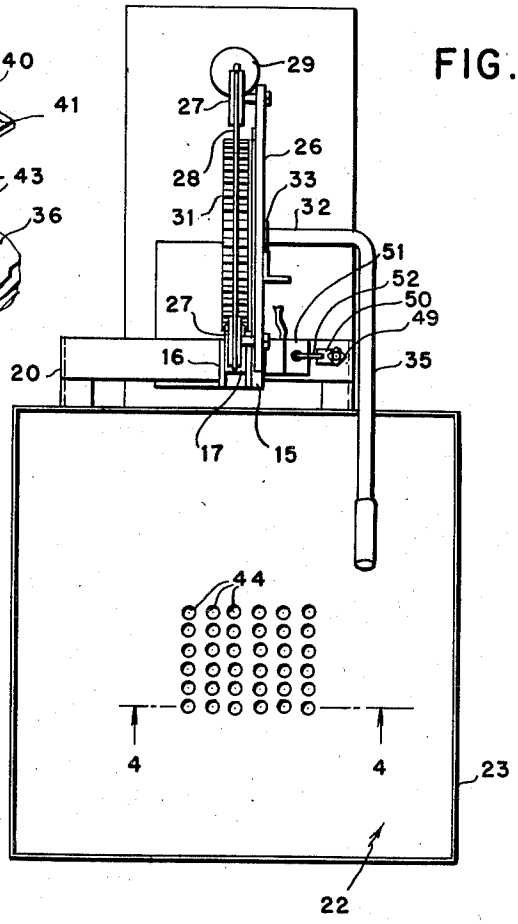
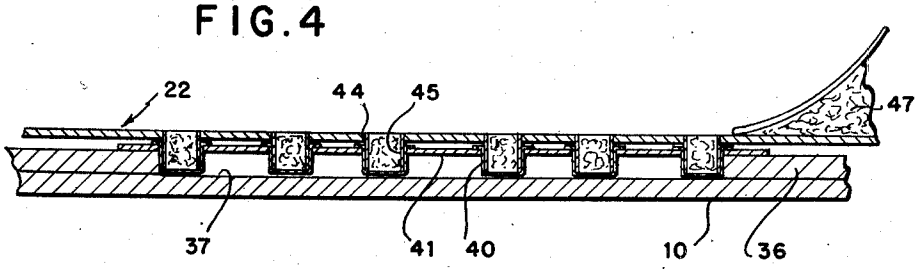


FIG.3

FIG.4



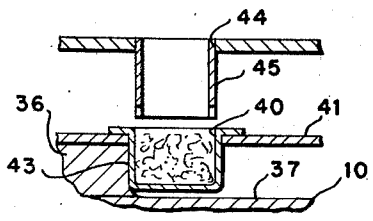


FIG.6

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PACKAGE FILLING APPARATUS AND METHOD

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Application November 22, 1952, Serial No. 322,005

12 Claims. (Cl. 141—1)

The present invention relates to apparatus for filling small measured quantities of highly viscous substance simultaneously into a plurality of receptacles and more particularly to apparatus which is especially adapted for use in the process of making the oil paint packages described and claimed in my co-pending application Serial No. 305,435, filed August 20, 1952.

In said application I have described and claimed a novel type of a package for small quantities of oil paint or like viscous substances, which is capable of preserving its contents indefinitely and is also conveniently capable of a number of repeated uses and is economically expendable.

In said application I have described such package as consisting of a flat-bottomed cylindrical cup or receptacle which is formed with a flange that may have continuous with it an enlargement to form a table-like top on which a pressure tape may be secured to open and close the receptacle, or which cup may be set into an opening formed into a relatively large section of rigid sheet material, such as cardboard, which similarly serves as a surface for the adhesion of the pressure tape closure for the receptacle.

In my said application I have described a method for making these packages which includes the step of arranging a plurality of such cups in regularly spaced relation in a continuous, rigid supporting sheet member substantially flush with the cup openings, filling the cups with the necessary material, simultaneously applying pressure tape over all or a plurality of such cups, and then die-cutting the continuous sheet along the spaces intermediate the cups to provide a plurality of severed packages of the invention from the same sheet.

The present invention is directed to apparatus for simultaneously filling all of the cups set or formed in a single supporting sheet, preliminary to the application of pressure tape thereover and to the severance of the sheet to provide separate individual packages.

Because of the high viscosity of the oil paints that are generally placed into the packages, no method or apparatus has heretofore been found suitable to simultaneously fill more than one of the cups at a time and each cup formed or set into the sheet prior to the severance step had to be separately individually filled, as through a pressure gun, with the desired amount of contents. The filling operation, therefore, has heretofore been laborious, slow and messy and relatively costly. The slowness of operation was enhanced by the frequent need for the taking apart and the putting together of the pressure gun for refilling.

The present invention is directed to the provision of apparatus which will quickly as well as easily, accurately and simultaneously fill all of the cups in any one supporting sheet, in one operation, to thereby make the filling operation time, labor, as well as material saving, and therefore making the packages of the present invention more economical to produce and more readily expendable.

The specific advantages and superiorities of the apparatus of the present invention will become more readily comprehensible to those skilled in the art from the one embodiment of the apparatus shown in the accompanying drawing and from the description following. It is to be understood, however, that such embodiment is shown by way of illustration only, to make the principles and practices of the invention more readily comprehensible and that any intent to limit the invention to the specific details therein shown.

In the drawings:

Fig. 1 is a view, in side elevation, of one embodiment of the apparatus of the present invention, shown in non-filling position;

Fig. 2 is a front elevational view of the same;

Fig. 3 is a top plan view of the apparatus;

Fig. 4 is an enlarged fragmentary sectional view taken on line 4—4 of Fig. 3, and showing the apparatus in filling position;

Fig. 5 is an exploded, fragmentary, perspective view showing a plurality of connected receptacles and a portion of the base of the apparatus, including the receptacle positioning recess; and

Fig. 6 is a fragmentary, enlarged, exploded sectional view showing details of the arrangement of a receptacle, with the receptacle positioning means and feed tube, immediately prior to the filling position.

Generally stated, the invention resides in the provision of apparatus by which there is simultaneously inserted a feed tube into each of a plurality of integrally supported receptacles with each feed tube being of a size to hold a measured quantity of viscous material that may be swabbed or pressed thereinto and of means for expelling the material from the feed tubes into the receptacles as the former are gradually simultaneously removed from the latter.

More specifically, the invention consists of a tray having a plurality of openings along a central portion thereof, such openings being spaced from one another in correspondence to the spacing of the receptacles from one another in their integrally supporting member, each of said tray openings having a dependent feed tube of a size that will hold a quantity of material that will not exceed the volume of a receptacle and which is adapted to rest on the bottom of the receptacle when the tray is positioned thereabove, and of tray vibrating means, preferably of the electrical type, which may be put into operation as the tray is lifted from the cups, preferably mechanically, to thereby shake the contents of the feed tubes into the cups.

Referring in greater detail to the apparatus of the present invention, the same may comprise a table, **10**, preferably supported on standards, **11**, and having rising therefrom an upright plate, **12**, disposed longitudinally at a rear central point thereof.

A horizontal plate, **14**, extends forwardly from the plate, **12**, and may carry on its end a vertical guide block, **15**, having a preferably rectangular guideway, **16**, therein, in which is supported, in vertically reciprocable position, a rack, **17**.

The lower end of the rack **17** supports, in any desired manner, a horizontally disposed bar, **20**, extending transversely of the table **10**, from which are supported, in turn, forwardly and longitudinally extending angle bars, **21**, on which is supported in horizontal position a tray, **22**, preferably having upstanding side walls, **23**.

The plate **12** carries a vertical angle bar, **25**, extending thereabove, at the top of which is supported a cross bar, **26**, preferably extending longitudinally of the table **10**, and carrying a pulley, **27**, at each of its ends, across which there is disposed a cable, **28**, one end of which is connected to the upper end of the rack **17** and the other

end of which supports weights, 29, for counterbalancing the weight of the rack 17 and the tray 22 supported therefrom.

Also supported on the plate 12 is a gear wheel, 31, of suitable size and in position to mesh with the rack 17, to move the rack and supported tray as the gear 31 is turned. The gear wheel 31 is supported at the end of a shaft, 32, which is journalled in a bearing, 33, set into an opening in the plate 12. The other end of the shaft 32, to the other side of the plate 12 from the gear wheel, may have, preferably integrally formed, as by offsetting the end thereof, an operating arm, 35, having a hand grip at its end.

It will be apparent that by this arrangement, the tray 32 may be moved up and down to lower the same on the table 10 and to raise it therefrom with great facility and with a minimum of effort.

Mounted on the table 10 below the tray 22 is a plate, 36, having a recess, 37, of preferably rectangular shape, formed therein which recess 37 opens into the forward end of the plate 36 preferably with rounded corners, 38.

The recess 37 is of a size to encompass therein in snug fit, all of the flat-bottomed receptacles or cups, 40, which are set in regular predetermined spaced relation in a rigid sheet or board, 41, which has been die cut to size and shape and to be provided with openings in predetermined arrangement and location for receiving the cups 41, so that the outermost of the receptacles 40 rest against the side walls, 43, of the recess 37 and the marginal edge portion of the board 41 overlie the marginal edge portion of the recess 37, as more clearly shown in Figs. 4 and 6. The depth of the recess 37 may be sufficient to accommodate the height of the receptacles 40 projecting from the underside of the board 41.

Formed in the bottom of the tray 22 are a plurality of openings, 44, spaced from one another to register with the receptacles 40 arranged in any board 41 that fitted into the recess 37. Each of the openings 44 is formed with a dependent cylindrical feed tube, 45, of a diameter that will fit within a receptacle and of a height which will reach to the bottom of the receptacle when the tray is lowered and of the combined height and diameter to have a volume not exceeding the volume of a receptacle.

In operation a board or sheet 41 of receptacles 40 is fitted into the recess 37, as by sliding thereinto. The tray 22 is then lowered by movement of the arm 35 in the proper direction until the bottoms of the feed tubes 45 rest on the bottoms of the receptacles 40. A quantity of the viscous oil paint, 47, or the like which may have previously been deposited in the tray 22 to one side of the openings 44 is then passed once or twice back and forth across the opening by means of a suitable swab or scraper to thereby fill the feed tubes 45, the main body of the paint being left to one side of the apertured area of the tray at the end of the operation. The tray 22 is then slowly and gradually lifted while some force is applied to discharge the contents of the feed tubes 45 into the receptacles 40 as such feed tubes are removed therefrom. In the form of the invention illustrated in the drawings such expulsion means comprises a vibrator, 48, preferably of the electrical type and preferably of the vertically operating type which is supported on the bottom of the tray 22. The particular construction of the vibrator 48 is not illustrated, as numerous such vibrators are readily available on the market and their construction does not constitute any part of this invention.

The vibrator 48 may be suitably connected to a source of electric current and may be put into operation by the operator, by the throwing of a switch suitably arranged in the circuit of the vibrator (not shown) immediately prior to his raising of the tray from the receptacles.

It has been found that the vibration of the tray 22 during the gradual removal thereof from the receptacles 40 effectively and completely empties the contents of the feed tubes 45 into their respective receptacles 40 thus

enabling the simultaneous filling of all the receptacles at one and the same time.

Means may be provided for automatically breaking the circuit through the vibrator 48 as the tray is raised in position. This means may include an upright post 49, supported on the cross bar 20, having at its upper end an adjustably supported bar 50, and a toggle switch 51 having a toggle arm 52, which is arranged in position to be tripped into circuit breaking position by the bar 50 as the tray is moved upwardly.

It will be understood, of course, that the making and breaking of the vibrator circuit may be entirely manual, and entirely performed by the operator at the proper time or may be entirely or in part automatic; as may be desired. As many circuits and mechanisms for their automatic or semi-automatic control being available or capable of being devised, they do not constitute any part of this invention.

After all of cups 40 in a sheet 41 have been simultaneously filled as described above, the sheet is removed from the apparatus and strip or strips of tab material are placed between each pair of rows of cups in the sheet, so that each row of cups has tape strip on one side thereof. Pressure tape is then simultaneously applied over each row of cups or over several or all of the rows of cups; such pressure tape also overlying the cup flanges and at least part of the sheet area surrounding each cup and wholly or partly overlying the tab strips. The supporting sheet 41 is then die-cut to simultaneously sever each cup and a surrounding portion of the sheet material and a portion of the tab strip from the sheet 41, to thereby simultaneously form a plurality of individual, separate packages of the invention.

This completes the description of the apparatus and method for the simultaneous filling of receptacles of the character described with viscous fluids. It will be readily apparent that the apparatus of the present invention, while highly efficient for its purpose, is of relatively simple construction and simple and easy to operate and that the methods for using the same are simple to practice, certain in their results and do not require the services of a skilled or trained operator.

It will also be apparent that the apparatus comprises few and simple operating parts that are strong and sturdy and are not likely to get out of order and will remain in efficient working condition for long periods of time. It will likewise be apparent that the apparatus of the present invention is compact and occupies but little space.

It will further be apparent that numerous variations and modifications in the apparatus of the present invention may be made by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth and without the use of any inventive ingenuity. I desire, therefore, to be protected for any and all such modifications and variations that may be made within the spirit of the present invention and the scope of the claims hereto appended.

What I claim is:

1. Apparatus for filling open top receptacles with a viscous fluid, including an open ended feed tube adapted to fit into the receptacle, means mounting said feed tube for vertical reciprocation, means positioning said receptacle in upright position below said feed tube and means associated with the feed tube for vibrating the same as it is moved out of the receptacle.

2. Apparatus for filling an open top receptacle with a viscous fluid, comprising a feed tube adapted to fit within the receptacle and to rest on the bottom thereof, means mounting said feed tube for vertical reciprocation, means positioning said receptacle in upright position below said feed tube and means associated with said feed tube for vibrating the same as it is moved out of the receptacle.

3. Apparatus for filling an open top receptacle with a viscous fluid, comprising a feed tube open at both ends

and adapted to be filled with the viscous fluid, said feed tube adapted to fit within the receptacle and to rest on the bottom thereof, means mounting said feed tube for vertical reciprocation, means positioning said receptacle in upright position below said feed tube and means associated with said feed tube to vibrate the same as it is moved out of the receptacle.

4. Apparatus for filling a receptacle having an opening in the top thereof with a viscous fluid, comprising an open ended feed tube adapted to fit into and rest on the bottom of the receptacle and of a volume not exceeding the volume of the receptacle, means mounting said feed tube for vertical reciprocation, means positioning said receptacle in upright position below said feed tube and means associated with said feed tube for vibrating the same as it is moved out of the receptacle.

5. Apparatus for filling a receptacle having a top opening with a viscous fluid, including an open ended feed tube adapted to have the fluid pressed thereinto, said feed tube adapted to fit within said top opening and to rest on the bottom of said receptacle and of a volume not to exceed the volume of said receptacle, means mounting said feed tube for vertical reciprocation, means positioning said receptacle in upright position below said feed tube and electrically operated vibrating means associated with said feed tube and adapted to vibrate the same as it is removed from said receptacle.

6. Apparatus for filling a receptacle having an opening in the top thereof with a viscous fluid, comprising means for positioning said receptacle in upright position, a tray supported above said receptacle positioning means for vertical reciprocation thereover, said tray having an opening formed in the bottom thereof in register with the opening of a receptacle arranged in said positioning means, a feed tube depending from the bottom of said tray around said opening, said feed tube of a size adapted to fit into said receptacle opening and to rest on the bottom of said receptacle and vibrating means associated with said tray adapted to vibrate the same as it is moved upwardly to remove the feed tube from the receptacle.

7. Apparatus for filling a receptacle having an opening in the top thereof with a viscous fluid, comprising means for positioning a receptacle in upright position, a tray mounted for vertical reciprocation above said positioning means, mechanism for vertically reciprocating said tray, an opening formed in the bottom of said tray in register with the opening of a receptacle disposed within said positioning means, a feed tube depending from the bottom of said tray around said opening, said feed tube of a size adapted to fit into said receptacle opening and to rest on the bottom thereof as said tray is lowered over said receptacle and of a volume not exceeding the volume of said receptacle, and electrically operated means for vibrating said tray as it is moved to remove the feed tube from the receptacle.

8. Apparatus for filling simultaneously a plurality of receptacles each having an opening in its top with a viscous fluid, comprising means for positioning said receptacles in upright position, a tray supported for vertical reciprocation over said positioning means, said tray having a plurality of openings formed in the bottom thereof along a central portion thereof, each of said openings arranged to register with the opening of one of the receptacles arranged in said positioning means, said tray having a plurality of open ended feed tubes depending from the bottom thereof, each around one of said openings, each of said feed tubes of a volume not exceeding the volume of a receptacle and of a size adapted to fit into a receptacle opening and rest on the bottom thereof as said tray is lowered in position, and means associated with said tray for vibrating the same as it is raised to remove said feed tubes from said receptacles.

9. Apparatus for simultaneously filling a plurality of

receptacles having a top opening and secured in spaced relation to one another in a unitary flat board, comprising a tray, means for supporting said tray in vertically reciprocable position, mechanism for selectively moving said tray upwardly and downwardly, including a counterbalance, means for positioning said receptacles below said tray, a plurality of apertures formed in the bottom of said tray at a distance from opposed edges thereof, each of said apertures arranged to register with the opening of one of the receptacles arranged in said positioning means, an open ended feed tube depending from the underside of said tray around each of said openings, each of said feed tubes of a volume not exceeding the volume of a receptacle and of a size to fit within the opening thereof and to rest on the bottom thereof as said tray is lowered into position, and electrically operated vibrating means connected in an electric surface supported on said tray and adapted to vibrate the same as it is raised in position to remove said feed tubes from said receptacles.

10. Apparatus for simultaneously filling a plurality of receptacles each having an opening in the top thereof and supported in spaced relation to one another in a unitary flat plate, comprising a base, an upright on said base, a guideway on said upright for a vertically reciprocable rack, a rack slidably arranged in said guideway, a horizontally disposed tray supported on said rack in position to extend over said base, counterbalancing means for said rack and said tray supported on said upright, a shaft journalled on said upright, said shaft having a gear wheel secured thereto engaging said rack and a handle for rotating said shaft to selectively reciprocate said rack upwardly and downwardly, said tray having a plurality of apertures formed in its bottom along a central portion thereof, each of said apertures having a feed tube continuous therewith depending from the underside of said tray, each of said feed tubes adapted to fit into and rest upon the bottom of a receptacle disposed below said tray, means on said base for positioning said receptacles in said plate each in register with one of said feed tubes, and vibrating means secured on said tray for vibrating the same as it is moved upwardly for removing said feed tubes from said receptacles.

11. The method for filling an open top receptacle with a viscous fluid which comprises the steps of arranging said receptacle in upright position, arranging an open ended feed tube within said receptacle with its bottom resting on the bottom of said receptacle, filling said feed tube with the viscous fluid, gradually withdrawing said feed tube from said receptacle and simultaneously vibrating said feed tube as it is withdrawn from said receptacle.

12. The method for simultaneously filling a plurality of receptacles having a top opening with a viscous substance which comprises the steps of positioning a tray having a plurality of spaced openings formed in its bottom and having feed tubes extending downwardly from said openings with each of its feed tubes extending into the opening of a receptacle and resting on the bottom thereof, moving a mass of the viscous material in the tray across said openings and pressing the same into said feed tubes, and then removing said feed tubes from said receptacles and simultaneously vibrating the tray to thereby expel the viscous material from the feed tubes into the receptacles.

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