Dec. 23, 1941. P. T. McILVRIED 2,266,979

FILLING MACHINE

Filed Jan. 22, 1940 4 Sheets-Sheet 1

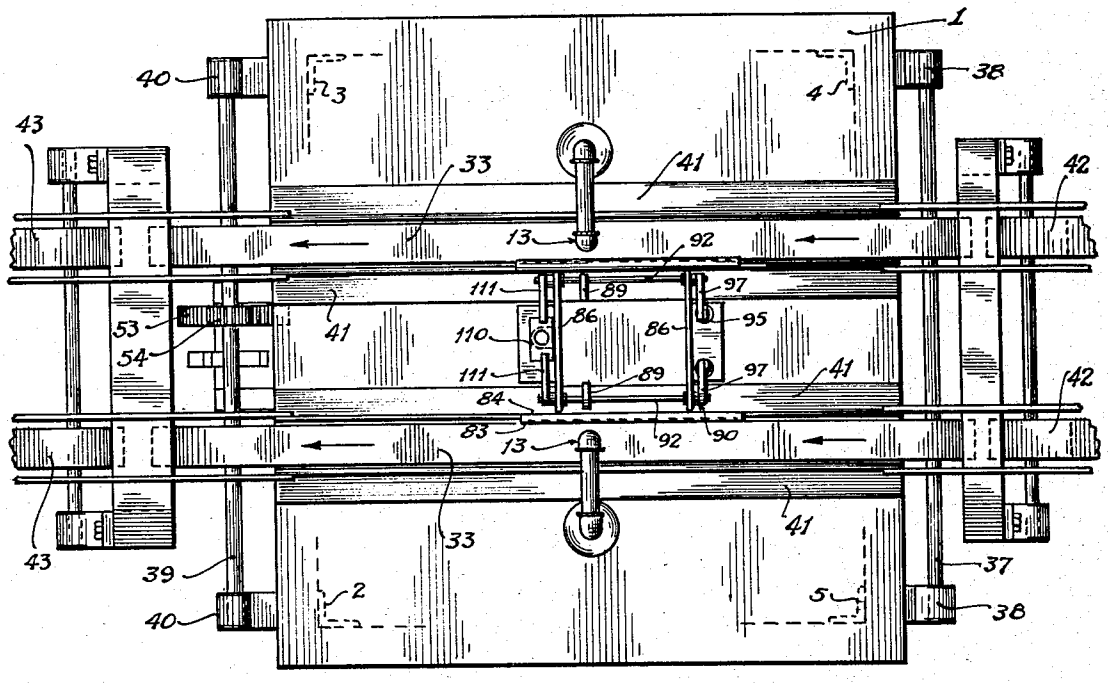

Fig. 1

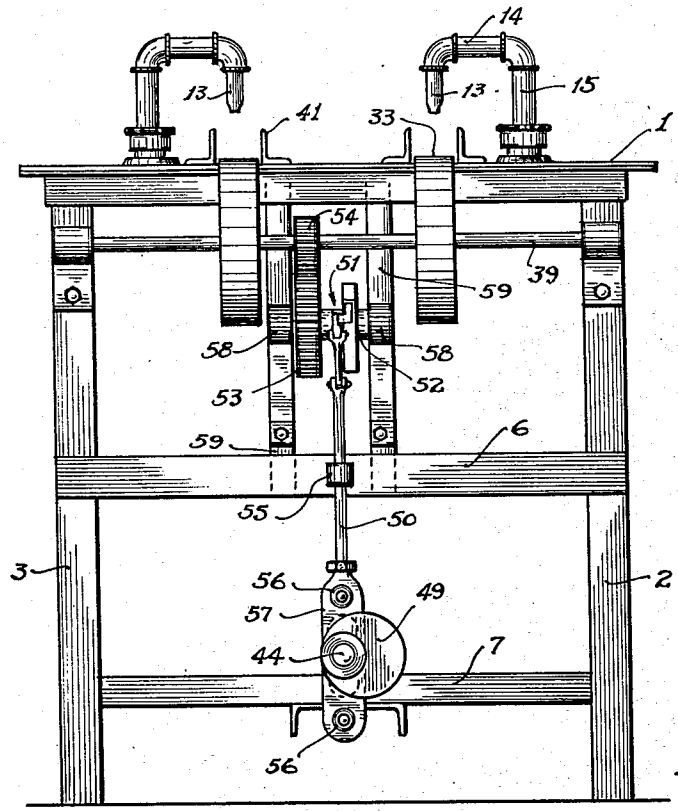

Fig. 4

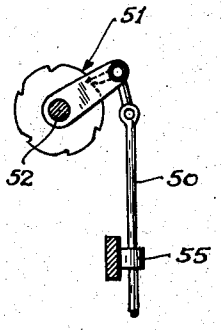

Fig. 8

ATTEST-

Wm C. Meiser

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FILLING MACHINE

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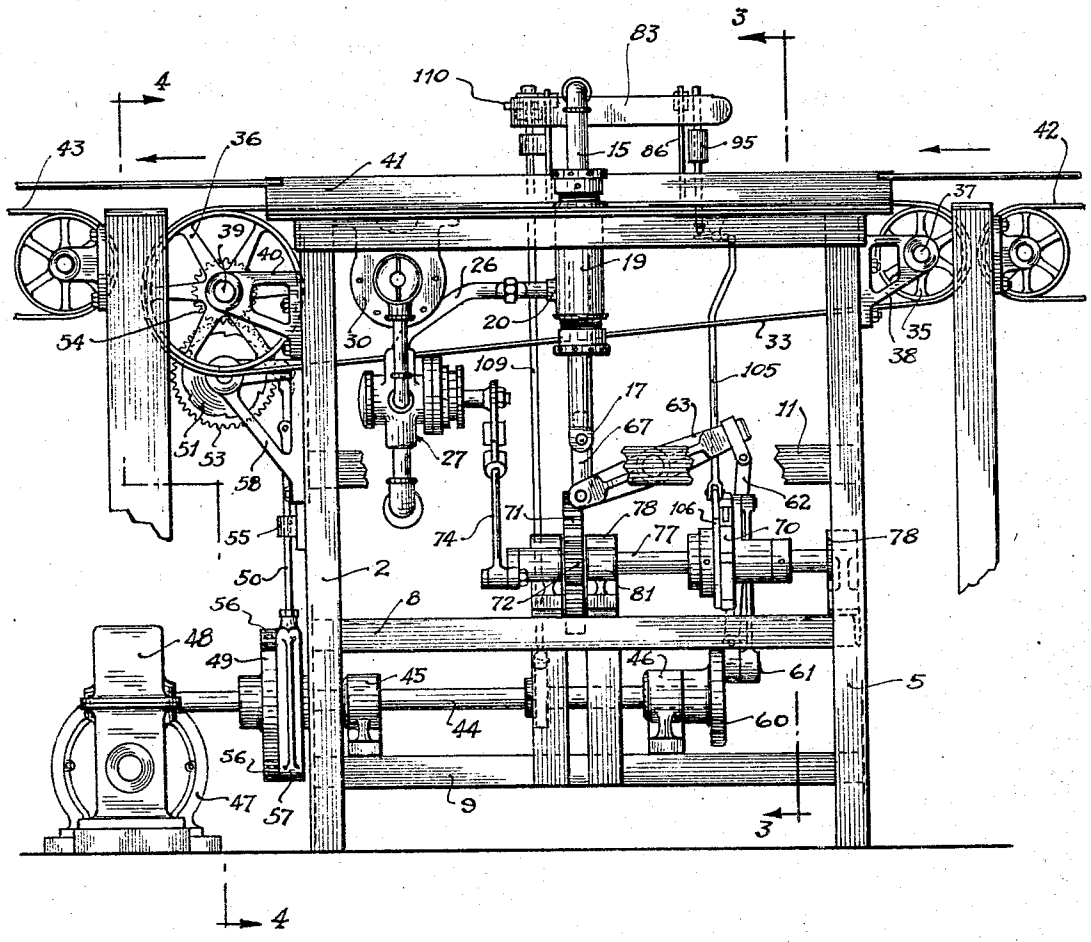

Fig. 2

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FILLING MACHINE

Filed Jan. 22, 1940 4 Sheets-Sheet 3

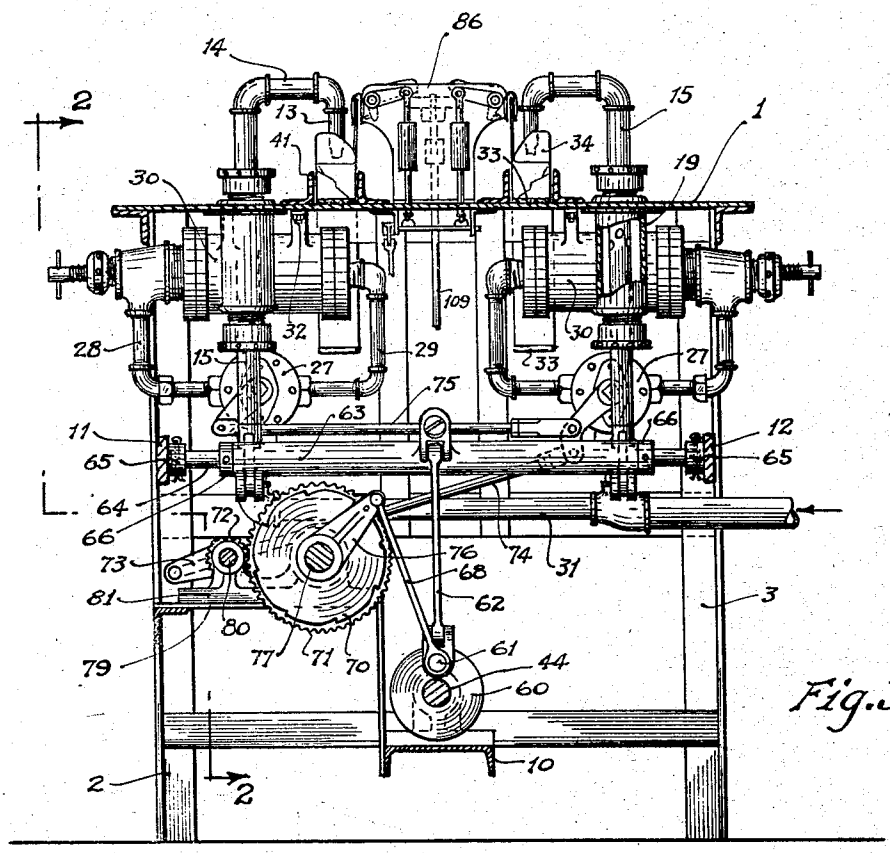

Fig. 3

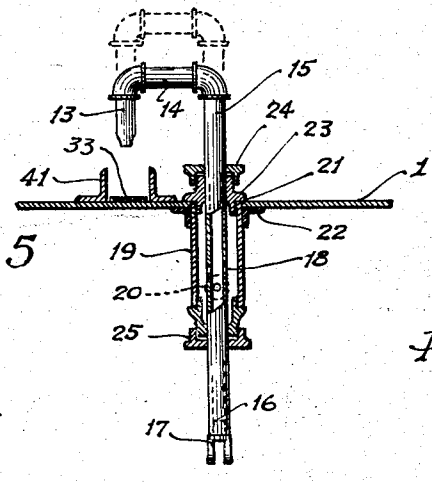

Fig. 5

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FILLING MACHINE

Filed Jan. 22, 1940 4 Sheets-Sheet 4

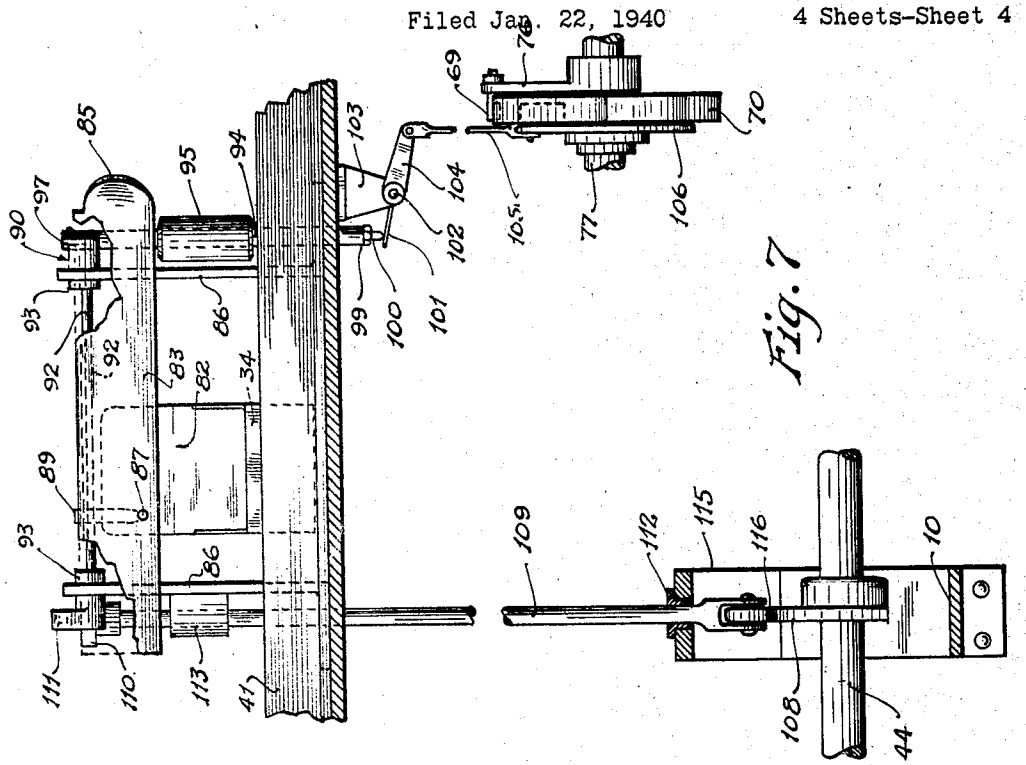

Fig. 7

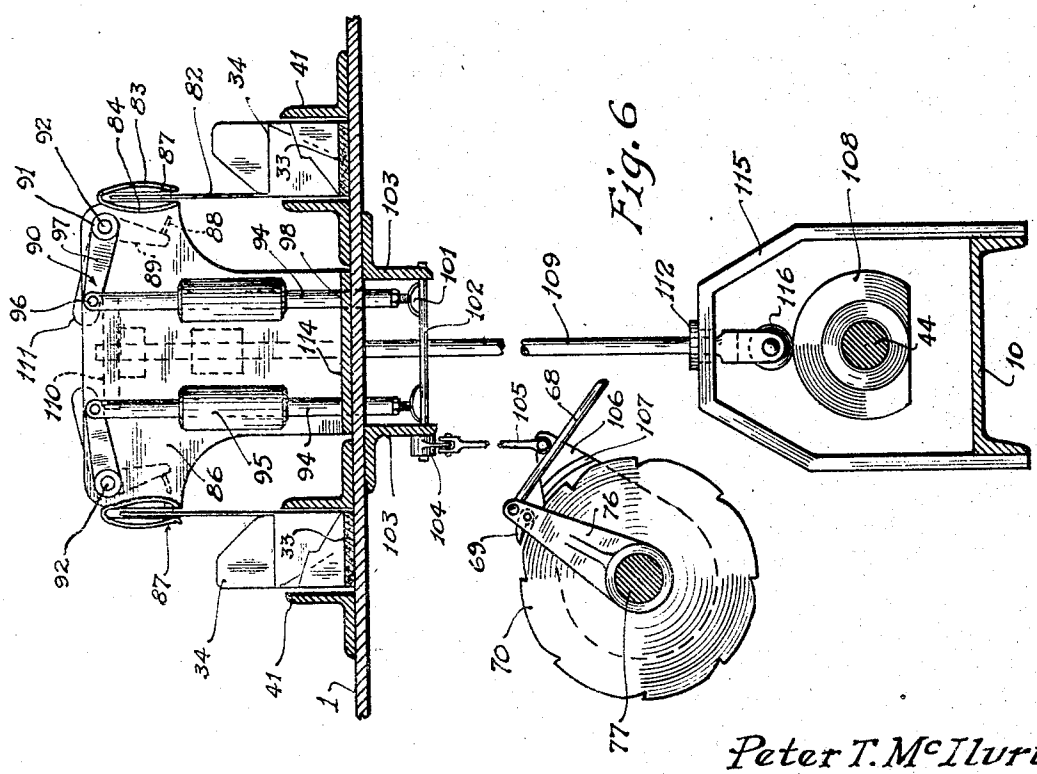

Fig. 6

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Patented Dec. 23, 1941 2,266,979

UNITED STATES PATENT OFFICE

2,266,979

FILLING MACHINE

Peter Theodore McIlvried, Woodridge, N. J., assignor to Industrial Patents Corporation, Chicago, Ill., a corporation of Delaware

Application January 22, 1940, Serial No. 315,086

10 Claims. (Cl. 226—99)

The invention relates to a measuring and filling apparatus for dispensing predetermined amounts of liquid and semiliquid materials, such as, for example, oils and fats and more particularly, to means for preventing operation of the filling means in the event a container fails of carriage relative to the filling spout.

One of the objects of the invention is to provide improvements in machines for dispensing predetermined amounts of liquid and semiliquid materials for the filling of packaging containers.

Another object of the invention is to provide improved means for preventing operation of a filling means in the event the packaging container fails of carriage relative to the filling spout.

In the drawings, like characters of reference are used to designate similar elements.

Figure 1 is a plan view of the measuring and filling device constructed in accordance with the present invention.

Figure 2 is a side view taken substantially on line 2—2 of Figure 3.

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 2.

Figure 4 is a view taken substantially on line 4—4 of Figure 2, the means for preventing operation of the filling means in the event a packaging container fails of carriage relative to the filling spout, being omitted.

Figure 5 is an enlarged detail view, partly in section, of the filling nozzle.

Figure 6 is an enlarged detail, partly in section, showing one side view of the means for preventing operation of the filling means in the event a packaging container fails of carriage relative to the filling spout.

Figure 7 is another side view, partly in section, of the means shown in Figure 6.

Figure 8 is a detail of the conveyor drive means.

The device comprises platform or table top 1 rigidly supported upon standards 2, 3, 4 and 5, the standards being reinforced with suitable cross members, for example, cross members 6, 7, 8, 9, 10, 11 and 12.

The device as shown in the drawings utilizes two measuring and filling apparatuses. Inasmuch as both apparatuses employ identical elements, it is deemed necessary to describe but one in detail.

In Figure 5, filling nozzle 13 communicates through conduit 14 with pipe line 15. Pipe line 15 is closed at its free end 16 as by threaded shackle 17 and intermediate its ends is provided with a plurality of relatively small inlet openings 18. Pipe line 15 is reciprocally mounted through relatively large, radially spaced, annular chamber 19, the openings 18 at all times being within the limits of chamber 19.

Chamber 19 is provided with inlet opening 20 and is rigidly affixed through opening 21 in table 1 as by integral flange 22 and threaded fitting 23. Leakage between chamber 19 and pipe line 15 is prevented through couplings 24 and 25. The filling material is forcibly fed within chamber 19 but is materially reduced in pressure in its passage through openings 18, so much so that spattering of the material as it issues from nozzle 13 is practically nil.

Opening 20 communicates through conduit 26 with four-way valve 27 which in turn communicates through lines 28 and 29 with measuring cylinder 30 and through line 31 with a source of material not shown. Measuring cylinder 30 is rigidly affixed as by bolts 32 to the undersurface of table 1. Valve 27 and measuring cylinder 30 are of the conventional type and since each of these elements is well known in the art, it is deemed unnecessary to describe either of them in further detail.

Belt conveyor 33 travels over the upper surface of table 1 and immediately beneath filling spout 13 and serves to carry filling containers 34 relative to filling spout 13. Conveyor 33 travels over rollers 35 and 36. Roller 35 is pinioned to shaft 37, journaled within bearings 38 rigidly affixed to standards 4 and 5. Roller 36 is pinioned to shaft 39 journaled within bearings 40 rigidly secured to standards 2 and 3. Suitable guides comprising angles 41 are rigidly secured to table 1 to either side of conveyor 33. As shown in Figure 2, conveyor 33 suitably connects with carton delivery conveyor 42 and take-away conveyor 43.

The filling spout 13 is reciprocated and the valve 27 through which the measuring cylinder 30 is controlled and conveyor 33 are operated in unison and essentially from a common drive shaft 44. Shaft 44 is journaled within bearings 45 and 46, rigidly secured to cross member 10 and receives its power from motor 47 through the medium of gear box 48.

As shown in Figures 2, 4 and 8, cam 49 is pinioned to shaft 44 and controls the movement of conveyor 33 through the medium of rod 50, ratchet and pawl mechanism 51, shaft 52 and gears 53 and 54. Rod 50 is slidably mounted through bearing 55 rigidly secured to cross member 6, and engages cam 49 through the medium of spaced rollers 56 mounted upon link 57.

Ratchet mechanism 51 and gear 53 are pinioned to shaft 52, which shaft is journaled in bearings 58 rigidly secured to supports 59. Gear 53 engages gear 54 which is pinioned to shaft 39. It will be seen, therefore, that drive shaft 44 serves to continuously operate conveyor 33 intermittently to successively carry containers 34 in a step by step movement relative to nozzle 13.

Crank 60, provided with arm 61, is pinioned to shaft 44 and through the medium of link 62, operates rocker 63 which in turn controls reciprocation of nozzle 13. Rocker 63 is rotatably mounted upon shaft 64 which in turn is mounted within keepers 65 rigidly secured to cross members 11 and 12. Collars 66 prevent longitudinal movement of rocker 63 on shaft 64. Rocker 63 connects with pipe line 15 and thus the nozzle 13, through the medium of link 67. Nozzle 13 is reciprocated downwardly relatively to a packaging container 34 following each movement of a packaging container 34 therebeneath and again upwardly following filling of the container.

As shown in Figures 3, 6 and 7, crank arm 61 also controls the operation of valves 27 through the medium of link 68, pawl 69, ratchet wheel 70, gear wheels 71 and 72, crank arm 73 and links 74 and 75. Pawl 69 is spring tensioned against ratchet wheel 70 and its circumferential movement relative to ratchet wheel 70 is controlled by arm 76 mounted for free movement on shaft 77. Ratchet wheel 70 and gear wheel 71 are pinioned to shaft 77. Shaft 77 is journaled within bearings 78 rigidly secured against base plate 79. Gear wheel 72 is driven by gear wheel 71 and together with crank arm 73 is rigidly secured to shaft 80. Shaft 80 is journaled within bearings 81 also rigidly secured to base 79. Link 74 connects crank arm 73 with one of the valves 27, and link 75 connects the two valves 27, whence it is seen that both of the valves are operated simultaneously from a common source of power.

Reference is now had to Figures 6 and 7 in which is shown in detail the means for preventing operation of valves 27 and consequently the force feed of material through nozzle 13 in the event a container 34 fails of carriage beneath one of the nozzles 13. It will be seen in these figures that each of the cartons 34 is provided with an upstanding cover portion 82 adapted for passage between spaced guide members 83 and 84. Guide members 83 and 84 are rigidly mounted opposite nozzle 13 adjacent one side edge of conveyor 33 and in longitudinal alignment with conveyor 33 and at their entrance end 85 are provided with outwardly flared lips to assure positive reception of cover portion 82 therebetween. Guide members 83 and 84 are rigidly mounted on risers 86 which in turn are rigidly secured to table 1. Guides 83 and 84 are provided with corresponding openings 87 for the free passage therethrough of pin 88 in the absence of a cover portion 82 therebetween. Pin 88 is rigidly secured to arm 89 of bell crank 90 pinioned as at 91 on shaft 92. Shaft 92 is rotatably mounted within suitable keepers 93 which in turn are rigidly secured through risers 86. Rod 94 provided with integral weight member 95 is pinioned at one end as at 96 to arm 97 of bell crank 90 and adjacent its opposite end as at 98 is slidably mounted through a suitable opening provided in table 1. Rod 94, at its free end 99 and through the medium of adjustment bolt 100, contactably engages trip lever 101, rigidly secured to shaft 102. Shaft 102 is journaled within suitable bearings provided within keepers 103 rigidly secured to the undersurface of table 1.

Crank arm 104 is pinioned to shaft 102 in opposed relationship with trip lever 101 and through the medium of link 105 engages crank member 106 mounted for free movement on shaft 77. Crank member 106 is provided with flange member 107 adapted for movement circumferentially of ratchet wheel 70 and intermediate pawl 69 and ratchet wheel 70 to force pawl 69 out of engagement with ratchet wheel 70 for one complete movement. Extreme downward movement of rod 94 serves to move flange 107 intermediate pawl 69 and ratchet wheel 70.

Cam 108 is pinioned to drive shaft 44 and through the medium of rod 109, pusher plate 110 and crank 111, serves intermittently to withhold bell crank 90 and thus the movement of pin 88 through openings 87, from against the gravity action of rod 94 and weight 95. Rod 109 is slidably mounted through bearings 112 and 113, and opening 114 provided in table 1. Bearing 112 is suitably mounted within frame support 115 which in turn is rigidly secured to cross member 10. Bearing 113 is rigidly secured to one of the risers 86. Rod 109 at one end engages cam 108 through the medium of roller 116. Pusher plate 110 is rigidly secured adjacent the opposite end of rod 109 and is adapted to engage crank arm 111 which in turn is pinioned to shaft 92.

Each movement of conveyor 33 normally delivers a new container 34 beneath nozzle 13 and simultaneously with each movement of the conveyor 33, cam 108 moves rod 109 to the extreme of its uppermost movement whence pin 88 is withheld from openings 87. Following each movement of conveyor 33, cam 108 serves to permit downward movement of rod 109 and thus gravity movement of rod 94 and weight 95 against bell crank 90. In the event a container 34 is carried by conveyor 33 beneath nozzle 13, movement of pin 88 through openings 87 is resisted by cover portion 82 between guide members 83 and 84 and thus movement of flange 107 intermediate pawl 69 and ratchet wheel 70 is prevented. This being the case, valve 27 is brought into operation and filling of the container 34 is completed. However, should container 34 fail of carriage beneath nozzle 13 it is seen that passage of pin 88 through openings 87 will be permitted and that gravity movement of rod 94 will continue to the extreme of its downwardmost position. As hereinbefore described, this latter movement of rod 94 will cause flange 107 to be moved intermediate pawl 69 and ratchet wheel 70 and thus it will be seen that operation of ratchet wheel 70 and valves 27 for one filling cycle will be prevented.

I claim:

1. In combination with a measuring and filling machine comprising a filling spout, a feed means communicating with the spout, a mechanism including a normally inactive member and a positively driven member alternately engageably and disengageably associated with the inactive member to periodically operate the feed means and a conveyor means operable intermittently to carry a container provided with an upstanding cover portion beneath the filling spout in synchronism with the operation of the feed means; a holding means associated with the positively driven means, a guide member to receive said upstanding cover portion and a feeler member operatively connected with the holding means and adapted for free movement through

the guide member in the absence of a cover portion and in the absence of a cover portion being adapted to actuate the holding means to prevent engagement of the driven member with the inactive member.

2. In combination with a measuring and filling machine comprising a filling spout, a feed means communicating with the spout, a mechanism including a normally inactive member and a positively driven member alternately engageably and disengageably associated with the inactive member to periodically operate the feed means and a conveyor means operable intermittently to carry a container provided with an upstanding cover portion beneath the filling spout in synchronism with the operation of the feed means; a holding means associated with the positively driven means, a guide member to receive said upstanding cover portion and a feeler member operatively connected with the holding means and adapted for free movement through the guide member in the absence of a cover portion and in the absence of a cover portion being adapted to actuate the holding means to prevent engagement of the driven member with the inactive member, the feeler member comprising a pivoted arm provided with weight means continuously urging its movement in the direction of a container carried beneath the filling spout.

3. In combination with a measuring and filling machine comprising a filling spout, a feed means communicating with the spout, a mechanism including a normally inactive ratchet wheel operatively associated with the feed means and a positively driven pawl alternately engageably and disengageably associated with the inactive member to periodically operate the feed means and a conveyor means operable intermittently to carry a container beneath the filling spout in synchronism with the operation of the feed means; a holding means mounted for movement intermediate the ratchet wheel and pawl and a feeler member operatively connected with the holding means and adapted for free movement against a container beneath the filling spout, continued movement of the feeler member in the absence of a container beneath the filling spout being adapted to actuate the holding means to prevent engagement of the driven member with the inactive member, the feeler member comprising a pivoted arm provided with weight means continuously urging its movement in the direction of a container carried beneath the filling spout, and means operable in synchronism with the conveyor to periodically withhold movement of the arm during carriage of a container beneath the filling spout and to permit free movement of the arm following normal carriage of a container beneath the filling spout.

4. In combination with a measuring and filling machine comprising a filling spout, a feed means communicating with the spout, a mechanism including a normally inactive ratchet wheel operatively associated with the feed means and a positively driven pawl alternately engageably and disengageably associated with the ratchet wheel to periodically operate the feed means and a conveyor means operable intermittently to carry a container provided with an upstanding cover portion beneath the filling spout in synchronism with the operation of the feed means; a holding member mounted for movement intermediate the ratchet wheel and pawl, and means comprising a pair of spaced guide members mounted relative to the conveyor and filling spout and adapted to receive the upstanding cover portion of a carton carried beneath the spout, corresponding openings through each of the guide members and a feeler finger operatively connected with the holding means and adapted periodically for free movement through the openings and in the absence of a cover portion between the guide members to actuate the holding means to prevent engagement of the pawl with the ratchet wheel.

5. In combination with a measuring and filling machine comprising a filling spout, a feed means communicating with the spout, a mechanism including a normally inactive ratchet wheel operatively associated with the feed means and a positively driven pawl alternately engageably and disengageably associated with the ratchet wheel to periodically operate the feed means and a conveyor means operable intermittently to carry a container provided with an upstanding cover portion beneath the filling spout in synchronism with the operation of the feed means; a holding member mounted for movement intermediate the ratchet wheel and pawl, and means comprising a pair of spaced guide members mounted relative to the conveyor and filling spout and adapted to receive the upstanding cover portion of a carton carried beneath the spout, corresponding openings through each of the guide members, a pivoted arm provided with a feeler finger adapted for movement through the openings, means tensioning movement of the arm and finger in the direction through the openings, means operatively connecting the arm and finger with the holding means whereby movement of the arm and finger is reflected to the holding means, and means operable in synchronism with the conveyor to periodically withhold movement of the arm and finger during normal carriage of a carton beneath the spout and to permit free movement of the arm and finger following normal carriage of a carton beneath the spout, continued movement of the finger through openings in the absence of a cover portion between the guide members being adapted to actuate the holding means to prevent engagement of the pawl with the ratchet wheel.

6. In combination with a device comprising a platform, a filling spout mounted on the platform, a feed means communicating with the spout, a main drive shaft, a second shaft, a ratchet wheel on the second shaft adapted to actuate the feed means, a crank means on the drive shaft operatively connected with a pawl means adapted alternately to engage and disengage the ratchet wheel to intermittently operate the feed means, a conveyor means adapted to carry a carton provided with an upstanding cover portion beneath the filling spout and means connecting the drive shaft with the conveyor means to operate the conveyor means intermittently in synchronism with the feed means; a holding means comprising a crank member on the second shaft providing an axial flange member adapted for movement circumferentially of the ratchet wheel and intermediate the ratchet wheel and pawl means, a third shaft provided with laterally opposite crank levers, one of the crank levers being operatively connected with the holding member, and feeler means comprising a pair of spaced guide members mounted

side by side relative to the spout and conveyor means and in longitudinal alignment with the conveyor means to receive the upstanding cover portion of a carton carried on the conveyor means, corresponding openings through each of the guide means, an arm pivoted for free movement on one of the guide means and provided with a feeler finger adapted for movement through the openings, a rod and weight member pivotally connected with the feeler arm and finger and engageably connected with the other of the crank levers of the third shaft, the rod and weight member being adapted to tension movement of the feeler finger through the openings and to transmit movement to the holding means, a cam on the drive shaft and a rod connecting the cam with the feeler arm and finger, the cam and rod being operable to withhold movement of the feeler arm and finger against the action of the weight and rod member during normal carriage of a carton beneath the spout and to permit free movement of the arm and finger following normal carriage of a carton beneath the spout, continued movement of the finger through the openings in the absence of a carton cover portion between the guide members being adapted to actuate the holding means to prevent engagement of the pawl with the ratchet wheel.

7. In combination with a machine for filling containers, a filling spout, valve means for the spout, a conveyor to position a receptacle to be filled under the spout, drive means for each of said conveyor and valve means, said drive means being interconnected to synchronize the operation of said valve and conveying means whereby feeding of material through the spout takes place when the conveyor moves a receptacle into position, said container having a relatively flexible outwardly extending flap fixedly secured thereto, a feeler means coacting with said flap, a means for supporting said flap when said feeler is in engagement therewith, and said feeler including means to control said valve means whereby feeding takes place only when the feeler is coacting with said flap, and said flap supporting means serving to provide a rigid backing for the flap so that said relatively flexible flap element will positively actuate the feeler when a container is present.

8. In combination with a machine for filling containers, a filling spout, valve means for the spout, a conveyor to position a receptacle to be filled under the spout, drive means for each of said conveyor and valve means, said drive means being interconnected to synchronize the operation of said valve and conveying means whereby feeding of material through the spout takes place when the conveyor moves a receptacle into position, said container having a relatively flexible outwardly extending flap fixedly secured thereto, a feeler means coacting with said flap, a means for supporting said flap when said feeler is in engagement therewith, said feeler comprising a member to reciprocate into and out of the path of said flap, means to withhold said member from said path while a flap is moved into position, means to release said member for reciprocation into said path whereby to detect the presence of said flap, and said feeler including means to control said valve means whereby feeding takes place only when the feeler is coacting with said flap, and said flap supporting means serving to provide a rigid backing for the flap so that said relatively flexible flap element will positively actuate the feeler when a container is present.

9. In combination with a machine for filling containers, a filling means, means for controlling the filling means, a conveyor to position a receptacle to be filled under the filling means, drive means for each of said conveyor and controlling means, said drive means being interconnected to synchronize the operation of said controlling and conveying means whereby feeding of material through the filling means takes place when the conveyor moves a receptacle into position, said container having a relatively flexible outwardly extending flap fixedly secured thereto, a feeler means coacting with said flap, a means for supporting said flap when said feeler is in engagement therewith, and said feeler including means to actuate said controlling means whereby feeding takes place only when the feeler is coacting with said flap, and said flap supporting means serving to provide a rigid backing for the flap so that said relatively flexible flap element will positively actuate the feeler when a container is present.

10. In combination with a machine for filling containers, a filling means, means for controlling the filling means, a conveyor to position a receptacle to be filled under the filling means, drive means for each of said conveyor and controlling means, said drive means being interconnected to synchronize the operation of said controlling and conveying means whereby feeding of material through the filling means takes place when the conveyor moves a receptacle into position, said container having a relatively flexible outwardly extending flap fixedly secured thereto, a feeler means coacting with said flap, a means for supporting said flap when said feeler is in engagement therewith, said feeler comprising a member to reciprocate into and out of the path of said flap, means to withhold said member from said path while a flap is moved into position, means to release said member for reciprocation into said path whereby to detect the presence of said flap, and said feeler including means to actuate said controlling means whereby feeding takes place only when the feeler is coacting with said flap, and said flap supporting means serving to provide a rigid backing for the flap so that said relatively flexible flap element will positively actuate the feeler when a container is present.

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