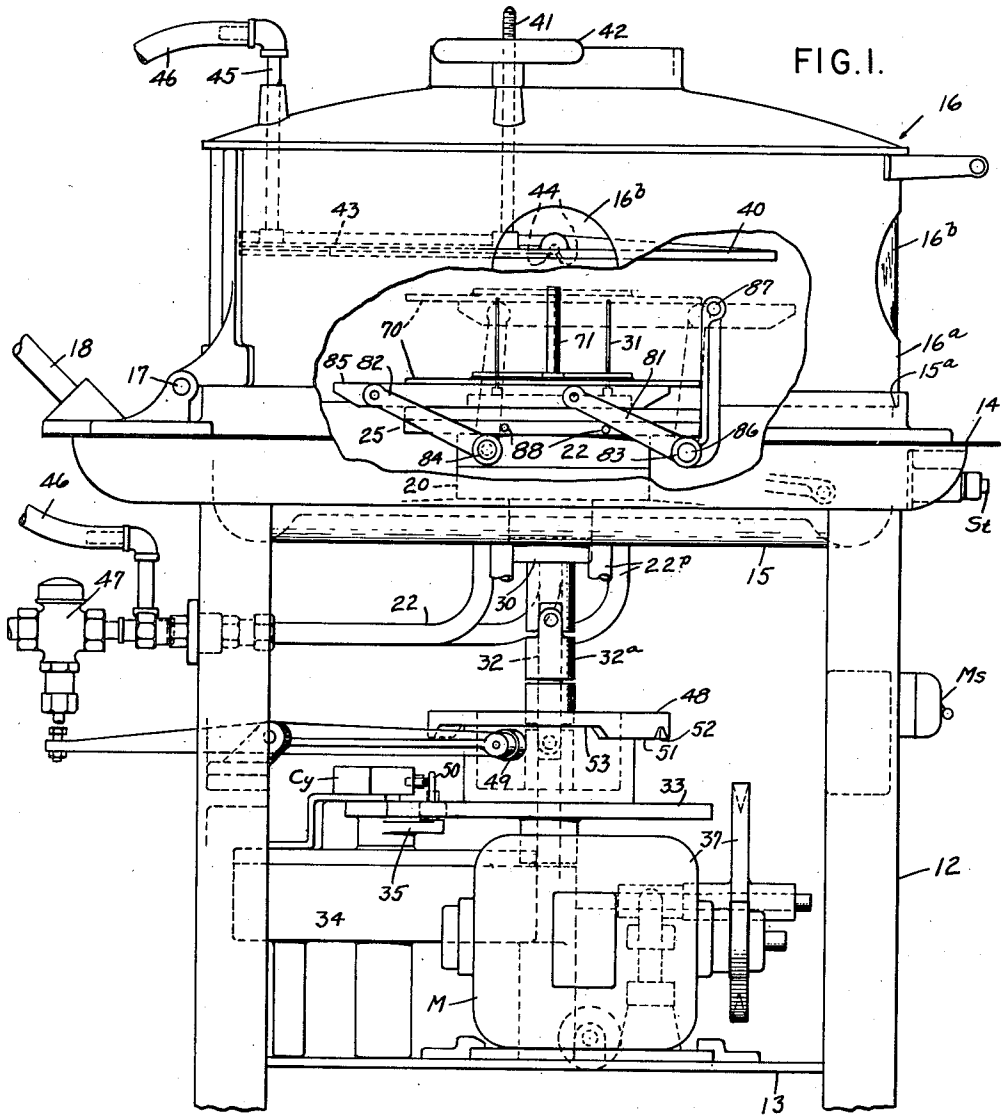
March 9, 1954 F. J. COZZOLI 2,671,457

MACHINE FOR WASHING BULK LOTS OF AMPOULES, VIALS, TUBES, AND THE LIKE

Filed Dec. 23, 1949 3 Sheets-Sheet 1

FIG. I.



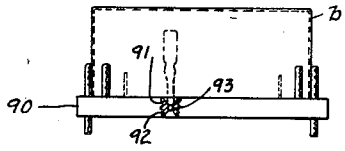


FIG. 9.

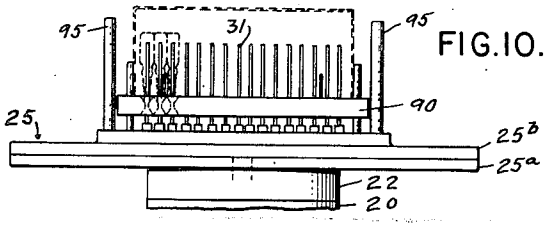


FIG. 10.

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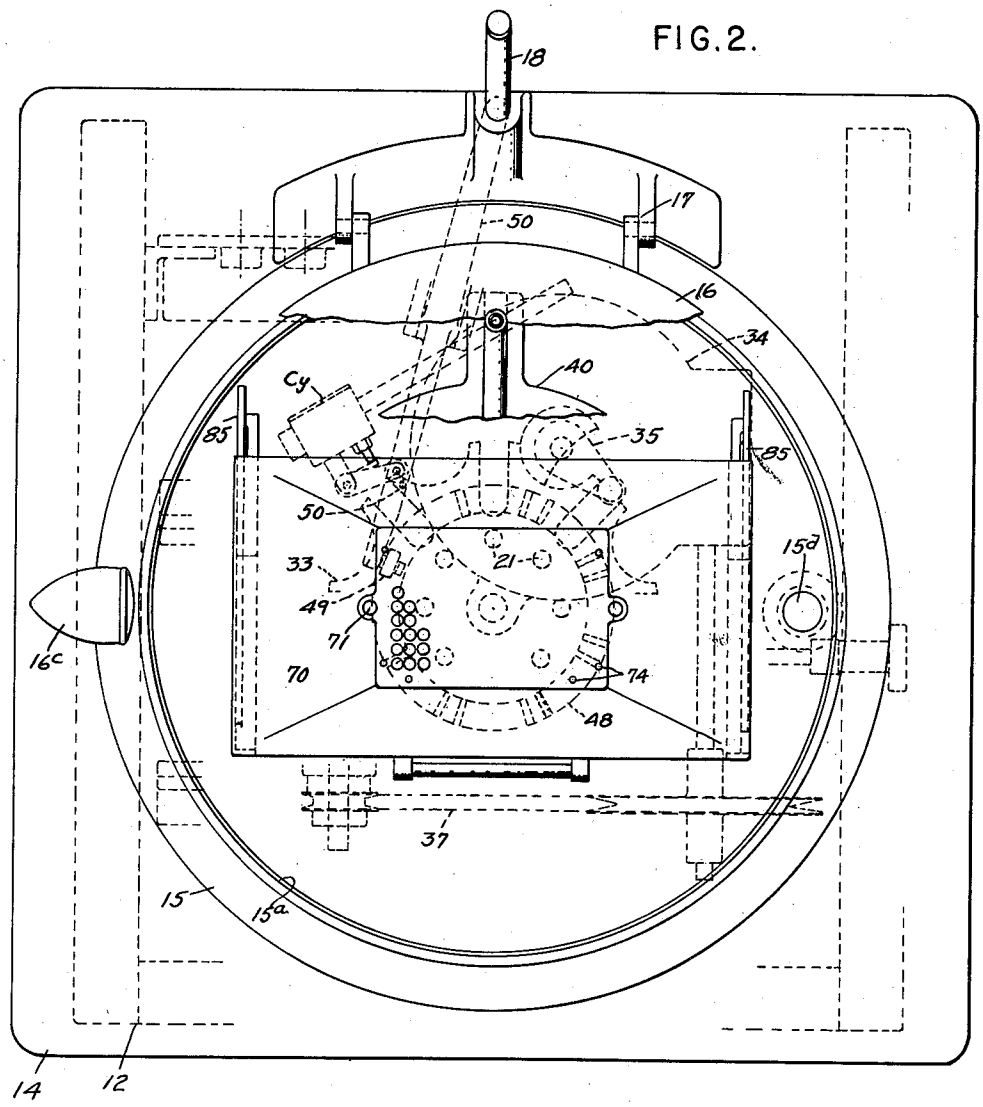
2,671,457

MACHINE FOR WASHING BULK LOTS OF AMPOULES, VIALS, TUBES, AND THE LIKE

Filed Dec. 23, 1949

3 Sheets-Sheet 2

FIG. 2.



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MACHINE FOR WASHING BULK LOTS OF AMPOULES, VIALS, TUBES, AND THE LIKE

Filed Dec. 23, 1949 3 Sheets-Sheet 3

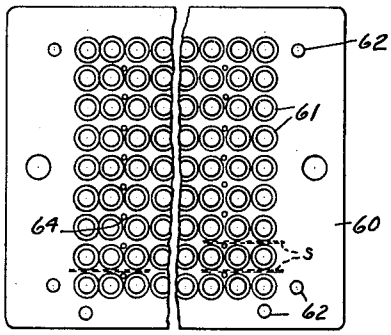


FIG.7.

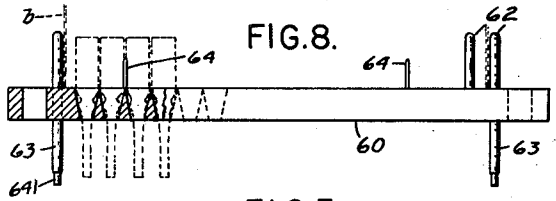


FIG.8.

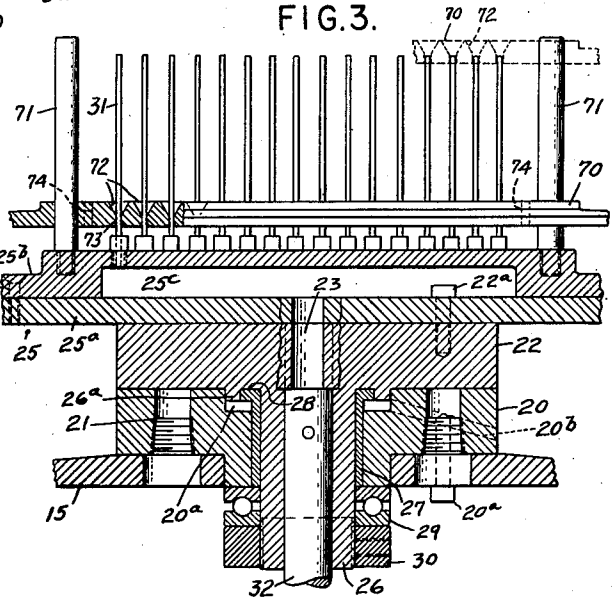
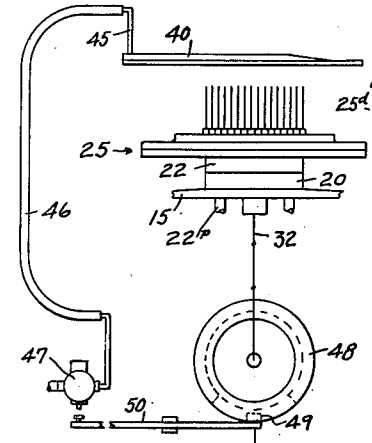


FIG.3.



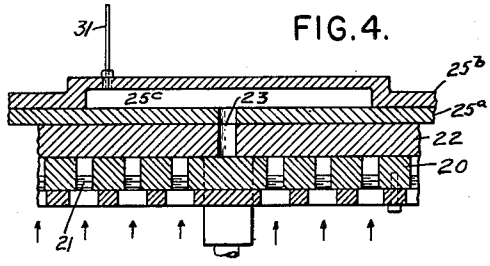


FIG.4.

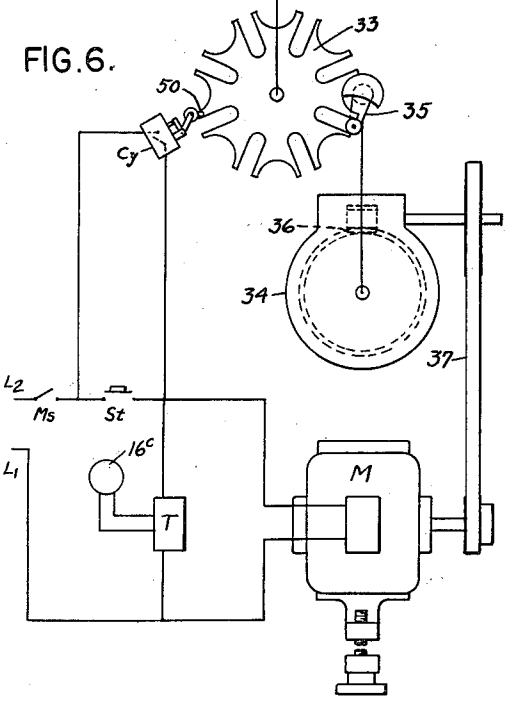


FIG.6.

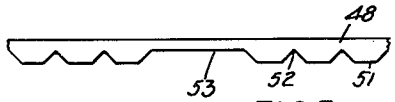


FIG.5.

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Patented Mar. 9, 1954 2,671,457

UNITED STATES PATENT OFFICE

2,671,457

MACHINE FOR WASHING BULK LOTS OF AMPOULES, VIALS, TUBES, AND THE LIKE

Frank J. Cozzoli, Plainfield, N. J.

Application December 23, 1949, Serial No. 134,687

7 Claims. (Cl. 134—134)

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The present invention relates to washing machines and is concerned more particularly with an apparatus operative to process ampuls, tubes, vials and like containers in bulk lots. The invention aims to render available structure and mechanisms adapted to carry out improved methods of processing ampuls, including for example the method disclosed in my earlier filed application Serial No. 106,903, filed July 26, 1949, as well as other methods. In some respects this application is a continuation of my aforesaid application, and in additional respects is a continuation in part of my aforesaid application.

The primary purpose of the instant invention is to provide apparatus for effectively processing small containers, such as ampuls, in bulk whereby not only to dispense with individual handling of the containers but to effect their processing expeditiously, and efficiently.

A further aim of the invention is to provide a washing apparatus with a combined manifold and valve means operative with a minimum leakage to admit one or more different processing agents selectively to the interiors of the containers during a processing cycle, and additional means operable automatically to flush the exteriors of the containers during the washing cycle, preferably in alternation with the respective processing operations on the interiors of the containers.

Still a further objective of the invention is the construction of a simple apparatus and control means therefor, in which loading and starting steps are accomplished manually and the valving operations are performed automatically and in prearranged sequence for one complete cycle of processing operations, after which the mechanism automatically stops, with all processing lines closed pending the removal of the processed containers and the loading of another lot.

Another aim of the invention is to provide convenient means for removing in orderly arranged fashion a plurality of containers, e. g. in lots of a gross, from their original shipping cartons, and thereafter handling, treating, or processing, the lot as a single unit.

In carrying out the aims of the invention it is proposed to construct a box plate with a plurality of cone-shaped apertures therein arranged as to number and disposition in substantial correspondence with the number and location of the individual containers as packed in an original carton or box. When the apertures in the plate are brought in registry with the containers, e. g. ampuls, in the box, the box and plate are together inverted whereupon the tips of the ampuls are caused to fall into the respective apertures. In one embodiment of the invention the cone-shaped apertures permit the ampuls to pass partly through the plate and are steadied thereby so that the box and spacers may be removed. The projecting ends of the ampuls are then brought into concentric relation with respective needles of the bank of processing needles and thereafter telescoped therewith. According to another embodiment of the invention, the box-plate is fashioned with cone-shaped apertures in one side to center the open ends of the containers when plate and box are inverted, without their passing completely through. Upon unitary inversion of the plate and box the inverted box and plate are then brought into washing relation with the processing jets after which the box and spacers are removed.

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When using either type of box plate, box plate remains upon the bank of needles or jets during the processing operations. Preferably the bank of needles receive the processing agents from a single manifold that has one inlet port adapted to be brought into registry, at intervals, with each of a plurality of ports delivering a processing agent. Thus the bank of needles and their manifold are caused to function in part as a valve, and may be periodically indexed from station to station by suitable means such as power operated Geneva index mechanism. Preferably a variable speed drive is provided and a coordinated system of controls for the outside washing instrumentalities and electrical controls including a master switch, a cycle start switch, and a cycle stop switch for the carrier. If desired means may be provided for illuminating the interior of a covered housing that may be provided to contain the bank of needles and ampuls during the processing operations.

Other objects and advantages will be in part indicated in the following description and in part rendered apparent therefrom in connection with the annexed drawings.

To enable others skilled in the art so fully to apprehend the underlying features hereof that they may embody the same in the various ways contemplated by this invention, drawings depicting a preferred typical construction have been annexed as a part of this disclosure and, in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:

Figure 1 of the drawings is a side elevation of a machine embodying the invention with parts broken away better to illustrate interior parts.

Figure 2 of the drawings is a plan view of the machine of Fig. 1, with portions of the cover broken away.

Fig. 3 is a sectional view of a distributing valve and needle manifold.

Fig. 4 is a diagrammatic developed view of the valve of Fig. 3.

Fig. 5 is a diagrammatic view of a control cam for the outside processing.

Fig. 6 is a line diagram of the transmission and a preferred form of control circuit therefor.

Fig. 7 is a form of box-plate and Fig. 8 a side view thereof.

Fig. 9 is a side view of another form of box-plate, and Fig. 10 is a view of the box-plate of Fig. 9 assembled upon the washing needles.

The machine illustrated in Figs. 1 and 2 comprises essentially a main frame 12 consisting of four legs connected by a lower shelf 13, and a top 14, a large basin 15 that is recessed into the top 14, and which normally is enclosed by a shell-like hood or cover 16 that confines the vapors during the processing operations. The hood is hinged as at 17 to the machine top and when lifted and swung back is supported upon a post 18 projecting from one of the hinge castings. When the cover is closed the lower marginal positions of the shell 16*a* fit within and upon an internal ledge 15*a* formed in the basin 15, and any processing fluid that may collect upon the inside thereof drains into the basin. Preferably the cover and shell should be metal so as to withstand the processing temperatures but may of course be constructed of transparent materials capable of withstanding the temperatures employed for a given washing process. When constructed of metal the shell may be provided with one or more windows 16*b* to permit examination and inspection of the interior during the processing. A light 16*c* may also be provided and arranged to focus through one of the windows to illuminate the interior.

The basin 15 is formed with a drain opening 15*d* in its marginal portion and with a finished surface centrally thereof for the mounting of one plate 20 of a distributing valve. The plate 20 is secured to the basin as by screws 20*a* (see Fig. 3) and is ported and tapped as at 21 to receive the fittings for a plurality of process lines 22*p*. The upper surface of the valve plate 20 is finished smooth and flat and is adapted to support a second valve plate 22, in which but one port 23 is formed on the same radius as the ports in the stationary plate 20. Plate 22 is secured as by screws 22*a* (only one shown) to a jet carrier and manifold 25 and both move together. The carrier 25 is formed preferably in two parts, namely a lower plate 25*a* and a removable jet plate 25*b*, the latter being fastened to the former by screws so as to be capable of interchange with others. The valve plate 22 is provided with a depending drive stem 26 that extends through the plate 20 and rotatively through a flanged bushing 27 that is tight in the plate 20. The bushing 27 projects upwardly from the plate 20 and into an annular recess 28 provided in the plate 22 around the drive stem. The plate 22 is also formed with a depending step or shoulder 26*a* that interfits a recess 20*a* in the stationary plate 20 whereby to form a seal. Hence pressure fluid that may travel inwardly laterally

from between the finished faces of the valve plates 20 and 22 first encounters the exterior wall of the projection 26*a* then falls into the annular recess 20*a*. In this manner pressure liquid is prevented from reaching and running down the drive stem to the drive mechanisms beneath. Fluid that may find its way into the recess 20*a* is lead into the basin via one or more radial ports 20*b*. By so interdigitating the complementary parts and providing ample relief passages, interior leakage is avoided without need of packing glands.

As indicated above, the drive stem 26 of the valve plate 22 projects through the valve plate 20 and carries an antifriction thrust bearing 29 backed up by an adjustable jam nut 30. By properly adjusting the nut 30, the engaging faces of the two valve plates may be urged together with adequate pressure to provide rotary movement therebetween without undue leakage even at relatively high line pressures.

As illustrated more particularly in Fig. 3 one of the carrier plates 25*a* or *b* is recessed as at 25*c* over an area slightly larger than the area of a group of jets whereby fluid pressure entering the manifold reaches all the jets somewhat uniformly. The respective jets 31 are carried by the removable cover plate 25*b* and their spacing in both directions is substantially that of the spacing of the ampuls or vials in the box packages. Different sizes of ampuls or vials require their respective matching jet plates as will be understood. By removing the clamp screws 25*d* of which there are a number placed around the margins of the manifold, the cover plate 25*b* and its assembly of jets is readily removed and replaced by another size. It will be observed also that the removal and replacement of one jet-plate for another, has no distorting effect upon the seating surfaces between the valve plates 20 and 22, these elements being inherently separate elements from the parts to which they are secured. Also their separate construction permits use of a wide selection of materials, for example cast aluminum for the basin 15, stainless steel for valve plate 20, bronze for valve plate 22, and bronze for the jet manifold 25, so as to assure long and trouble free wearing characteristics as well as compatibility with respect to the processing agents employed.

Main drive

A drive shaft 32 is pinned or otherwise secured to the drive stem 26 of the needle carrier assembly, and extends downwardly and is operatively connected with a Geneva star wheel 33. For convenience in manufacturing and assembling, the drive shaft may incorporate universal joint 32*a*. The star wheel is journaled in bearings provided in a gear housing 34, and is intermittently actuated by a Geneva crank 35 also journaled in the housing 34. The crank is driven by a worm and gear reduction mechanism 36, contained within the housing 34, and which is powered by a variable speed drive means indicated generally at 37. In the instant embodiment, the Geneva star wheel and crank are constructed to yield eight indexes and eight stops per revolution of the carrier 25, one stop or dwell interval being regarded as a loading station, and the other seven stops being processing stations. At the loading station there is a large gap between the process ports 21 in the plate 20 (see diagrammatic Fig. 4) at which zone the port 23 leading into the manifold is blanked off. When the machine is in

operation, the carrier assembly 25 indexes intermittently from station to station and the port 23 thereof is brought successively into the registry with the process ports in the valve member 20 and remain in registry therewith during the periods the Geneva crank is traversing idly and the Geneva star wheel is locked. The respective processing periods may be varied by varying the speed of the drive means 37 as will be understood.

Outside wash

Flushing of the exteriors of the containers is also envisaged by the provision of a ported hold down plate 40, adjustably suspended from the cover 16 by means of threaded screws and hand wheels 41, 42 (but one shown). The hold down plate is large enough to span the diagonals of a group of containers and is drilled as at 43 and 44 to deliver a spray that cascades over the group of containers during the indexing operations. An outside washing agent is conducted to the ports within the hold-down plate through piping 45, hose 46, and a normally closed valve 47, from a suitable source. It has been found that it is preferable to effect the rinsing of the exteriors during the indexing motions of the carrier, as better dispersion of the fluid about the sides of the containers is obtained when the containers are in motion. To that end a step-cam 48 is mounted upon the Geneva star wheel, and which is arranged to be tracked by a follower roll 49 carried upon a pivoted valve actuating lever 50. The cam 48 is fashioned with a series of "high" portions 51 and a series of low portions 52 and 53. The low portions corresponding to the "off" position of the valve 47 and the "high" portions to the "on" position of the valve. These high portions as shown herein (Figs. 4 and 5) being located in phase relation with the gaps between ports in the valve plate 20. Accordingly as the port 23 in the carrier is traversing a blank portion of the valve plate 20, the outside wash valve 47, is "on." When the carrier is at rest and process fluid is being injected into the containers by the needle jets 31, the outside wash valve 47 is closed. The extended low portion 53 of the valve cam 48 is related to coincide with the location of the loading station of the machine so that the outside wash is also shut off when the carrier is loaded and unloaded.

Control system

A control circuit affording cyclic operation of the carrier through one revolution is illustrated diagrammatically in Fig. 6. In this diagram one of the power lines L_1 leads to the motor M. The other line L_2 also leads to the motor but incorporates a main switch *Ms*, a normally open start switch *St* and a normally closed cycle switch *Cy*, the latter two being connected in parallel. The cycle switch is actuated to open position by a pin 50 carried by one of the fingers of the Geneva star wheel 33, and in the position shown in Fig. 6 the circuit to the motor is dead. To start the machine the main switch is first closed and the push button switch *St* actuated to closed position whereupon the circuit to the motor is completed and the Geneva crank starts to revolve. As the follower roll of the Geneva crank enters the next slot in the star wheel and begins to move same, the pin 50 moves away from the switch *Cy* and the latter closes. The motor circuit is then completed through the cycle switch and the operator may release his pressure on the starting switch *St*. Power indexing of the carrier continues from station to station until one complete revolution is made at which time the pin 50 on the star wheel again actuates the switch *Cy* to open position and the motor circuit is interrupted. The light circuit including a transformer T and light 16*c* may be connected across the motor lines to not only illuminate the interior of the hood 16 but also provide a visual signal indicative that processing operations are in progress.

Loading and unloading

Containers, such as ampuls, are frequently packaged in boxes containing 144, by the manufacturer. Heretofore it has been customary to empty the box on a tray and then pick up the ampuls individually and place them upon the washing needles. In the method disclosed in my prior application Serial No. 106,903, the box of ampuls is handled as a unit, and 144 are processed at one time. Figs. 1, 3, 7 and 8 hereof illustrate structural features of one form of apparatus designed and adapted for handling containers in bulk lots, and which comprises essentially a box-plate locating 60 and a needle centering plate 70.

The box-plate 60 is generally rectangular and of an area slightly larger than a box of ampuls of a given size. The plate is provided with a plurality of conical openings 61 spaced substantially in conformity with the spacing of the ampuls in the box. The plate is also provided with a series of box locating pins 62 spaced outside the conical holes and on three sides thereof, which when inverted and placed upon an open box of ampuls, locate the box and the ampuls in substantial alignment with the conical holes in the plate. When so placed upon a box of ampuls, the larger ends of the conical openings are disposed toward the stem ends of the ampuls. Both box and assembled box-plate are then inverted as a unit and the ampuls fall by gravity into the conical recesses 61. Leg elements 63, which may be extensions of the box pins 62, are provided on the other side of the plate upon which the plate and its load of projecting ampuls may rest while the operator removes the box *b* per se and the spacers *s* that are customarily inserted to divide the ampuls in rows within the box. Ordinarily, the ampuls in a full box of ampuls are rather tightly compacted and to induce free falling out when inverted, one or more of the spacers or filler sheets around the margins of the ampuls should first be removed. In removing the marginal filler sheets the ampuls are free to move laterally, and while the lateral shift is small per ampul, it is large in the aggregate, and the spacing of the conical recesses in the box-plate must be proportioned accordingly. Also when a box of ampuls, having the marginal fillers removed is turned on its side, or nearly so, the rows of ampuls and their intervening spacers tend to settle and tip to one side so that the stem ends no longer register with the openings in the plate, on completion of the act of inverting. Therefore to insure registry, the box-plate 60 is furnished with additional pins 64 so located as to project into the rectangular space defined by four adjacent ampuls and to one side of the ampul row spacer sheets *s*. At least two such pins are provided for each row spacer, making 16 in all for a box containing 9 rows of ampuls. As the box-plate is placed upon an open and relieved box of ampuls, the box pins 62 first locate the box and then the spacer pins 64, by means of a downward and slightly lateral movement imparted to the plate, engage the sides of

the spacers and effectively support the spacers as the box and plate are revolved in space and the ampuls remain aligned and slide freely into the cone recesses 61 in the plate 60.

When the ampuls have fallen into the recesses, their body portions being slightly larger than the cones, are confined therein in substantially parallel alignment. The original box *b* and remaining spacer sheets *s* are then removed. The plate with its charge of inverted ampuls is next placed upon the washing needles of the carrier 25. In order to facilitate that operation, the needle plate 70 is provided. Plate 70 is mounted for vertical movement relative to the carrier and is guided by guide rods 71 located outside of the margins of the group of washing needles. The needle plate is formed with plurality of upwardly facing conical recesses 72 that merge into cylindrical needle guide bores 73 disposed toward the lower side of the plate. Plate elevating means, later to be explained, are provided to raise and lower the plate along the needles. When the needle plate is in its elevated position the ends of the needles (31) are still within the cylindrical guide holes 73 of the plate but below the cones 72 as indicated by dotted lines in Figs. 1 and 3.

The box-plate 60 is placed upon the plate 70 and gently lowered until the projecting stem ends of the respective ampuls bottom in cones 72 in the plate 70 and become centered thereby with the needles 31. The leg elements 63 of the box-plate 60, are shouldered (641) at their lower ends, for a distance approximately the depth of the cones 72, and enter guide holes 74 formed in the needle plate, whereby the box-plate is located and comes to rest at a fixed distance from the needle plate with the weight of each ampul resting on the conical sides of its respective recess in the needle plate.

With the parts in the position explained, the needle plate is lowered on the guide posts 71, and the guided ends of the 144 needles 31 are caused to enter the stems of the concentrically positioned ampuls simultaneously. When the plate has been lowered the full distance, the hood 16 is swung to closed position and processing cycle instituted by pressing the switch St.

Raising and lowering of plates 60 and 70 may be accomplished conveniently by means illustrated in Fig. 1 which includes a pair of levers 81, 82 each pivoted at one end to the carrier as at 83, 84 and to each other at their free ends through the medium of a rail 85. The rail 85 is thus caused to partake of the action of a parallel bar when the levers 81, 82, are swung about the fixed pivots. A similar rail and pair of levers is provided at both ends of the carrier and is overlaid by the ends of the needle plate 70. To actuate the two rails 85 in unison, one of the levers at each end of the carrier is pinned to a cross-shaft 86, and the actuating handle 87 is pinned to the cross-shaft. In the position illustrated in Fig. 1 the handle is up and the plate down. When the handle is moved forward and down, the levers 81, 82, are rocked and the rails 85 move upwardly and forwardly. Stop pins 88 projecting from the carrier limit the extremes of movement of the levers and consequently the upper and lower limits of plate elevation.

The apparatus illustrated in Figs. 9 and 10, utilizes centering principles disclosed in my prior patents, for example Patent No. 2,381,436. In the instant embodiment, however, the box-plate 90 of Fig. 9, is fashioned as a single plate with conical recesses 91, 92 in both sides with a connecting needle guide bore 93 disposed substantially mid-way the plate. The plate 90 is also provided with box-locating pins and spacer supporting means as previously described in connection with the plate 60. In using this form of box-plate 90, the plate is placed over an open box of ampuls, in the manner previously described, and both plate and box are inverted as a unit. The stems of the ampuls fall into their respective cones (but not through them) and the plate 90, ampuls and box are placed over the bank of needles and gently lowered thereon. The cone recesses 92 in the needle side of the plate center the respective needles with the ampuls that are centered in the cones 91 in the opposite side. The plate 90 is brought into registry with the bank of needles by guide means as by posts 95 which function to guide the margins of the plate, preferably on all sides, e. g. left, right, front and rear. The guide posts 95 should be taller than the needles to insure proper alignment vertically before the plate is lowered into engagement with the needles. Similarly when the plate is removed the operator will be obliged to lift the plate vertically clear of the needles before lateral movement can be achieved.

After the plate had been lowered its full distance and the ampuls telescoped with the individual needles, the box and ampul row spacers are removed from the machine, the cover 16 is closed and the processing cycle instituted.

On completion of the processing operation, the ampuls may be removed from the needles by first placing a box or sterilizing tray over the bank of ampuls so as to confine same, and then raise the box-plate 90, ampuls and tray, as a unit off the needles. When they have been lifted off the needles, they may be stored or inverted and the box-plate made ready for use on a new lot of ampuls. The washed ampuls may then be sent as a group to a sterilizer or other processing apparatus, e. g. filling.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can, by applying current knowledge, readily adapt it for various utilizations by retaining one or more of the features that, from the standpoint of the prior art, fairly constitute essential characteristics of either the generic or specific aspects of this invention and, therefore, such adaptations should be, and are intended to be, comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of the United States:

1. In a washing machine adapted to wash a plurality of containers simultaneously, said machine having a plurality of washing jets which the respective containers are to be associated during the washing operation, the combination of a main support for the jets, means for positioning the containers in washing relation with the respective jets comprising a perforated plate member adapted to be placed upon and in substantially axial alignment with the containers of a group to be washed with the perforations of the plate in registry with the mouths of the containers operative when the plate and group of containers is inverted as a unit to receive the mouths of containers, a second perforated plate member mounted upon the washing jets for relative movement axially thereof from an operating position adjacent the base of the jets to a receiv-

ing position adjacent the outlet ends of the jets whereat a portion of the plate extends beyond the jet ends so that the mouth ends of the containers may be received in the perforations thereof while the jet ends remain confined in the perforations in the remaining portion of the plate, means for registering the perforations of the first named plate with the perforations of the second named plate when the plates are assembled in spaced relation one above the other and when the said second movable plate is in its receiving position, plate-raising means connected with said main support and operatively engaging said second perforated plate member for moving said second perforated plate member and the first named plate and containers assembled thereon from said receiving position to said operating position whereby to position the containers and the jets in telescoped washing relation, and means for actuating said plate-raising means.

2. The combination of claim 1 in which said plate-raising means is operable upon completion of the washing operation to elevate the second plate member and the first plate member and containers assembled thereon from said operating position to said receiving position whereby to effect withdrawal of the containers from telescoped relation with the jets.

3. An ampul washing machine having a bank of relatively fixed washing-needles adapted to be telescoped by ampuls to be washed, a relatively stationary support for said bank of washing needles, a relatively movable centering plate mounted on the needles for use in securing registration of the outlet ends of the washing needles with the open ends of the ampuls prior to the telescoping operation comprising a perforated member, the perforations of which are conical and flare outwardly toward the upper side of the plate, said conical perforations terminating in concentrically related cylindrical needle-guide openings that extend from the apexes of the conical portions to the underside of the plate, said cylindrical openings being of a size large enough to pass the respective washing needles but smaller than the open ends of the ampuls so that the needles are closely surrounded and supported against lateral deflection and effectively guided and constrained thereby into concentric relation with the associated conical portions of the perforations, a movable plate-carrier operatively connected with said support and movable axially of the needles for supporting the plate, said plate-carrier having two effective positions and adapted when actuated to one position to support the plate in a position adjacent the ends of the needles wherein the conical portions of the perforations occupy positions beyond the ends of the needles so as to receive and center the open ends of ampuls while the needles remain guided and supported in the needle guide openings and when actuated to another effective position to support the plate in a position adjacent the bases of the needles wherein the needles are caused to project into and through the conical portions of the plate and into the centered ends of the ampuls, means for actuating said movable plate-carrier to effect movement of the plate axially of the needles electively to either of said named positions, and for holding same in said positions during a loading or an ampul processing operation respectively, and guide means provided in part by the centering plate and in part by the needle-bank support for maintaining registration of the perforations in the centering plate with the needles of the bank during movement of the plate axially of the needles.

4. An ampul washing machine having a bank of washing-needles adapted to be telescoped by ampuls to be washed, a relatively stationary support for said bank of needles, a relatively thin first perforated plate member, the perforations of which are adapted to receive and confine a multiplicity of ampuls in inverted position in spaced relation corresponding to the spacing of the needles of the bank of washing needles, means for securing registration of the outlet ends of the washing needles with the open ends of the ampuls prior to the telescoping operation comprising a second perforated plate member movable axially of the needles, the perforations of which are conical and flare outwardly toward the upper side of the plate, said conical perforations terminating in concentrically related needle-guide openings that extend from the apexes of the cones outwardly to the underside of the plate, said needle-guide openings being of a size large enough to pass the respective washing needles but smaller than the open ends of the ampuls, guide means provided in part by the second plate member and in part by the needle-bank support for registering the perforations of the second plate with the needles of the bank, and additional means provided in part by the first plate and in part by the second plate for registering the perforations in the former with the perforations in the latter, a movable plate-carrier operatively connected with said support for supporting said second plate member and adapted when actuated to move the said second plate member axially of the needles electively to an ampul receiving position in which the outlet ends of the needles are out of the conical portions of the perforations of the second plate but remain confined in and centered by the said needle-guide openings so that the conical portions of said second plate are open to receive and center the ends of ampuls confined in the first plate member or to a working position adjacent the base of the needles to effect a telescoping of the plate-confined needles with the ampuls, and means for actuating said movable plate-carrier.

5. The combination of claim 4 in which the said additional means provided in part by the first plate and in part by the second plate comprise spacer elements carried by the first plate operative when the plate is placed upon a plane surface to elevate the plate and mouth ends of the containers from the plane of said surface, said spacer elements having reduced end portions to provide a shoulder means located a selected distance from their ends operative as stops, and said second plate member having cavities therein to receive only the reduced end portions of the said spacer elements.

6. In a machine for washing a plurality of containers simultaneously, the combination of a bank of vertically arranged washing elements with which the respective containers are to telescope during the washing operation, a support for said bank of washing elements, means for positioning a group of containers in telescoped washing relation with the respective elements, including a vertically movable plate-carrying means operatively connected with said support, said plate-carrying means having an upper effective position adjacent the outlet ends of the washing elements for loading and a lower effective position for washing, means for actuating said plate-carrying means electively to either of said positions and

for holding the plate-carrying means therein during the loading operation and during the washing operation, a loading plate member adapted to be supported on and carried by said vertically movable plate-carrying means, said plate member having perforations therein spaced in conformity with the spacing of the washing elements of the machine and adapted to confine the containers to be washed in inverted positions therein, guide means provided in part by said loading plate and in part by the support for maintaining the respective perforations of the plate in registry with the respective washing elements of the bank during vertical movement of said plate-carrying means, spacer elements carried by the underside of said loading plate effective when the plate is removed from the vertically movable plate-carrying means of the machine and placed upon a plane surface to elevate the plate an equivalent amount so that the mouth ends of the containers are spaced from the said plane surface, said spacer elements and said plate-carrying means being so constructed and related as to render said spacer elements ineffective when the loading plate is placed upon the said movable plate-carrying means so that the loading plate and the mouth ends of the containers are lowered an equivalent amount relative to the plane of the movable plate-carrying means to bring the mouth ends of the containers relatively close to the outlet ends of the washing elements prior to a lowering of the plate-carrying means to washing position in response to movement of said actuating means for the plate-carrying means.

7. In a washing machine adapted to wash a plurality of containers simultaneously, said machine having a plurality of washing jets with which the respective containers are to be associated during the washing operation, the combination of a main support for the jets, means for positioning the containers in washing relation with the respective jets comprising a perforated plate member adapted to be placed upon and in substantially axial alignment with the containers of a group to be washed with the perforations of the plate in registry with the mouths of the containers operative when the plate and group of containers is inverted as a unit to receive the mouths of containers, a second perforated plate member mounted upon the washing jets for relative movement axially thereof from an operating position adjacent the base of the jets to a receiving position adjacent the outlet ends of the jets whereat a portion of the plate extends beyond the jet ends so that the mouth ends of the containers may be received in the perforations thereof while the jet ends remain confined in the perforations in the remaining portion of the plate, means for registering the perforations of the first named plate with the perforations of the second named plate when the plates are assemled in spaced relation one above the other and when the said second plate is in its receiving position, movable plate-supporting means connected with said main support and operatively engaging said second perforated plate member for supporting and moving said second perforated plate member and the first named plate and containers assembled thereon from said receiving position to said operating position whereby to position the containers and the jets in telescoped washing relation, additional means carried by one of said plates for maintaining the assembled plates in non-contacting spaced relation during the washing operation, and means for actuating said plate-supporting means to effect movement of the plate members from one of said positions to another.

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