

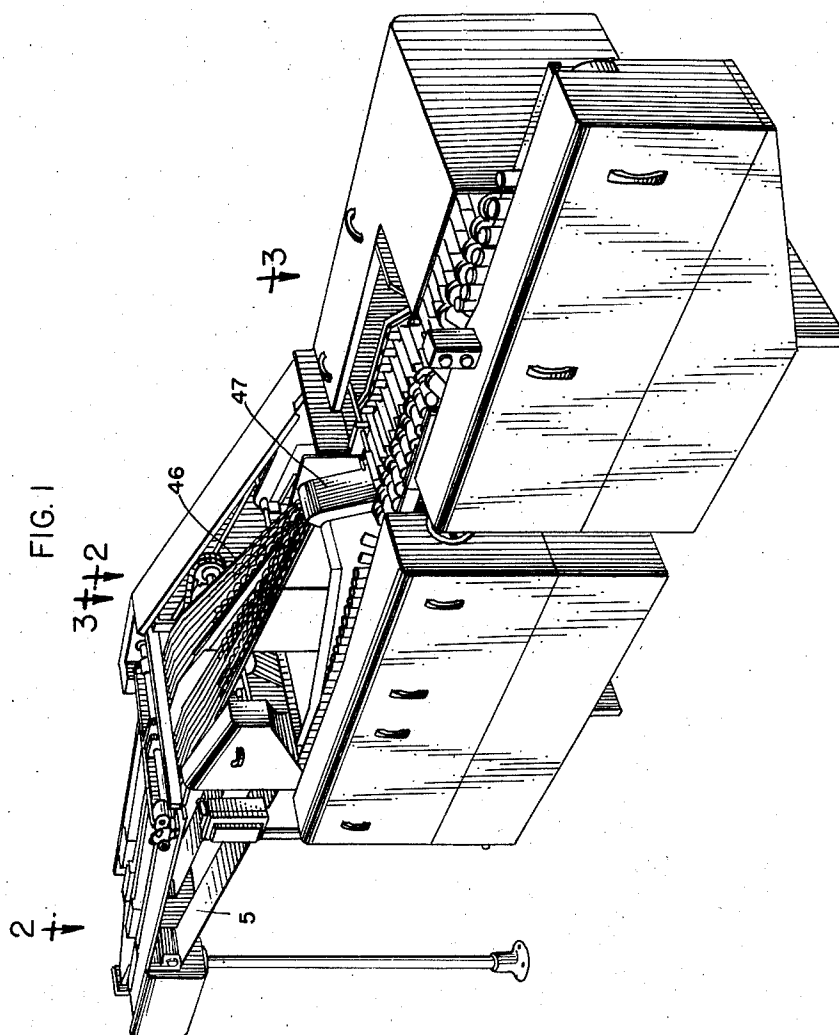
April 8, 1958

H. E. ENGLESON ET AL
TABLET BOTTLE FILLING MACHINE

2,829,476

Filed May 14, 1954

7 Sheets-Sheet 1



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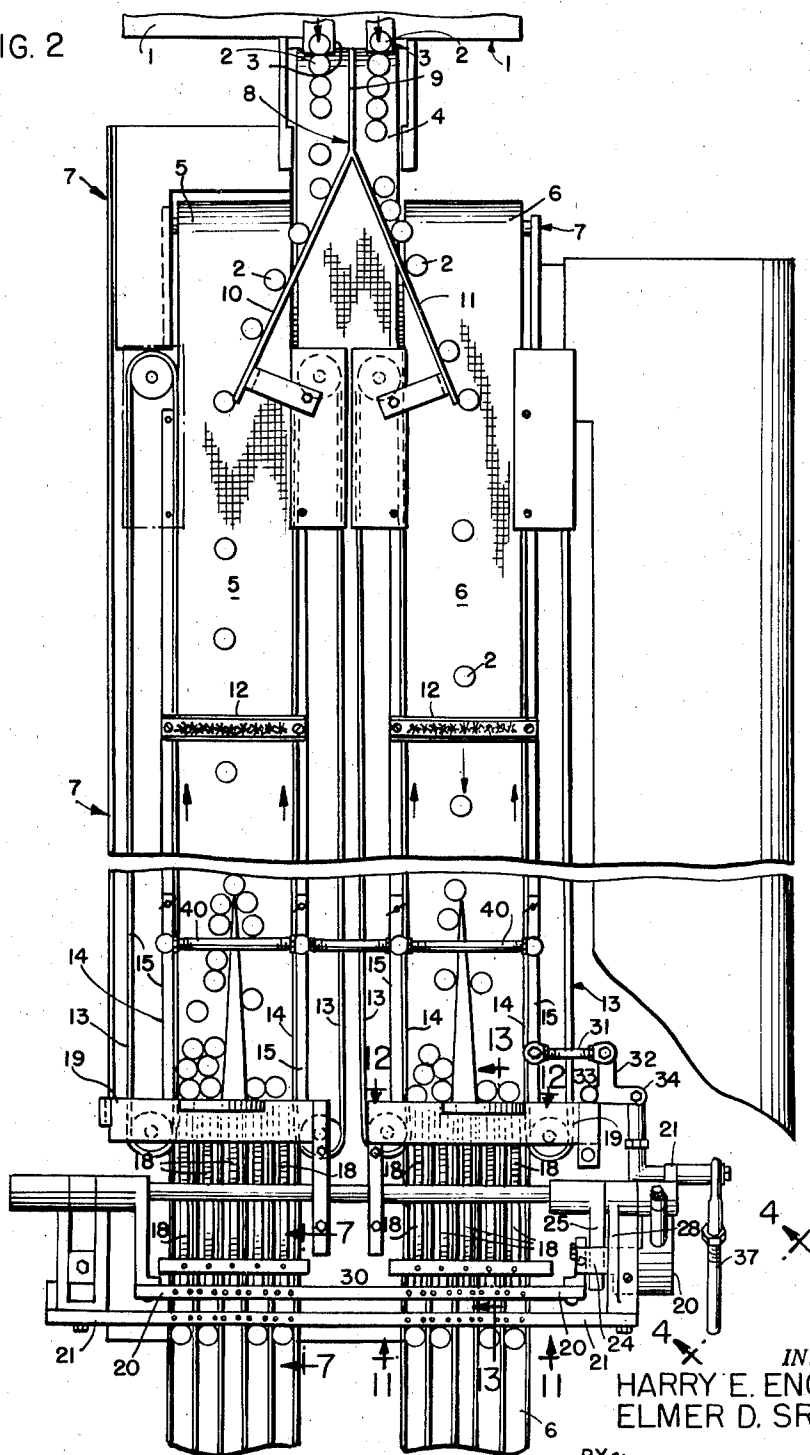
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TABLET BOTTLE FILLING MACHINE

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FIG. 2



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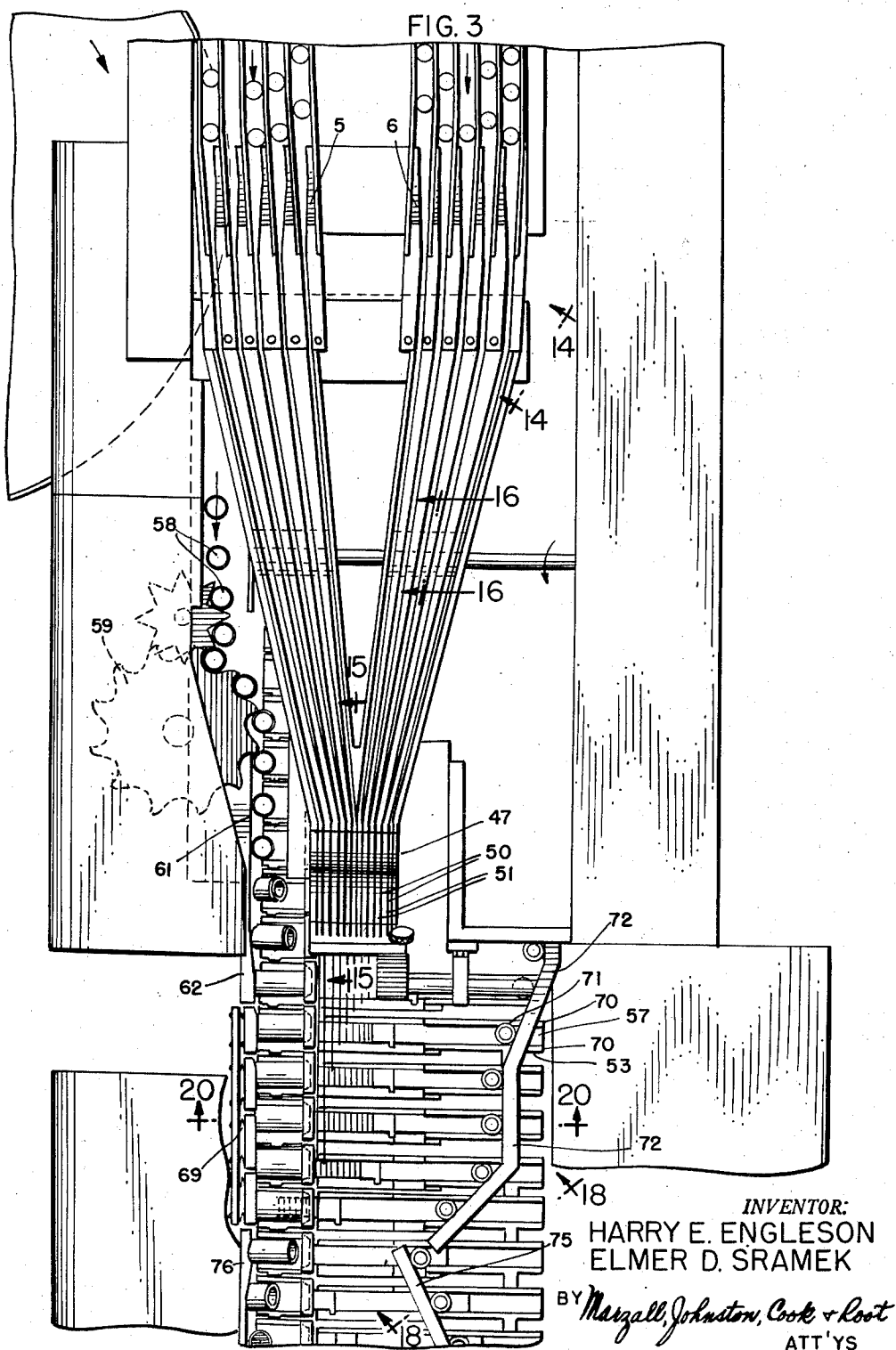
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FIG. 4

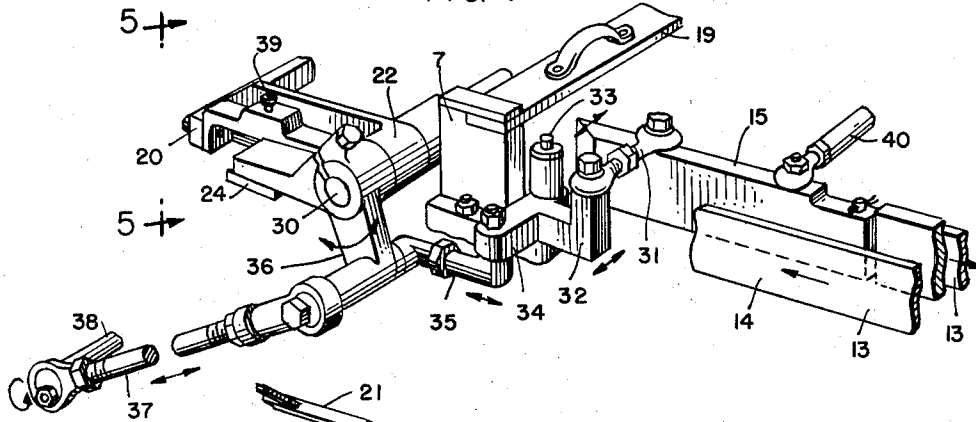


FIG. 5

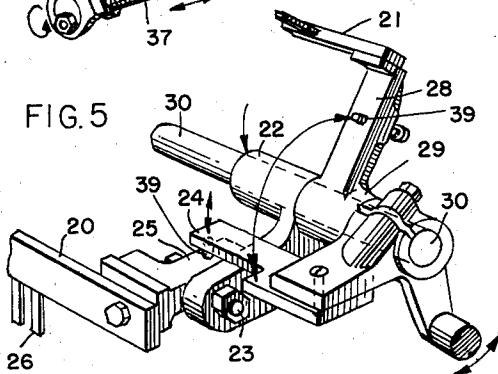


FIG. 6

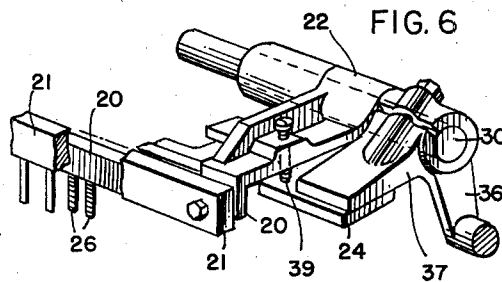


FIG. 7

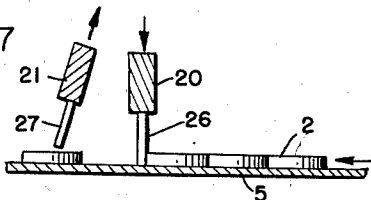


FIG. 8

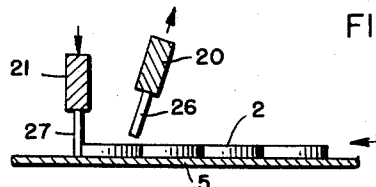


FIG. 9

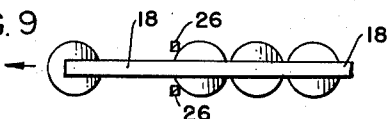


FIG. 10

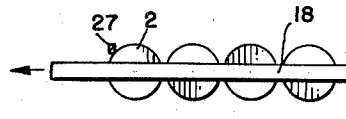


FIG. 11

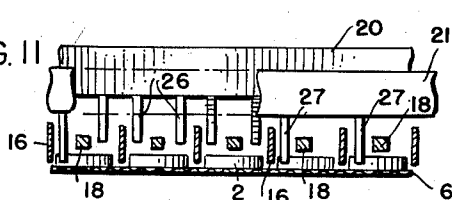


FIG. 12

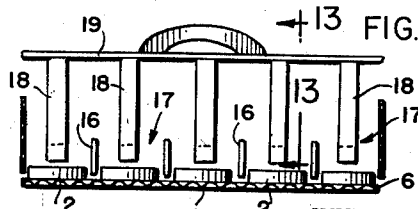
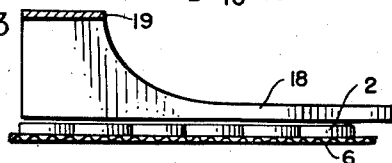


FIG. 13



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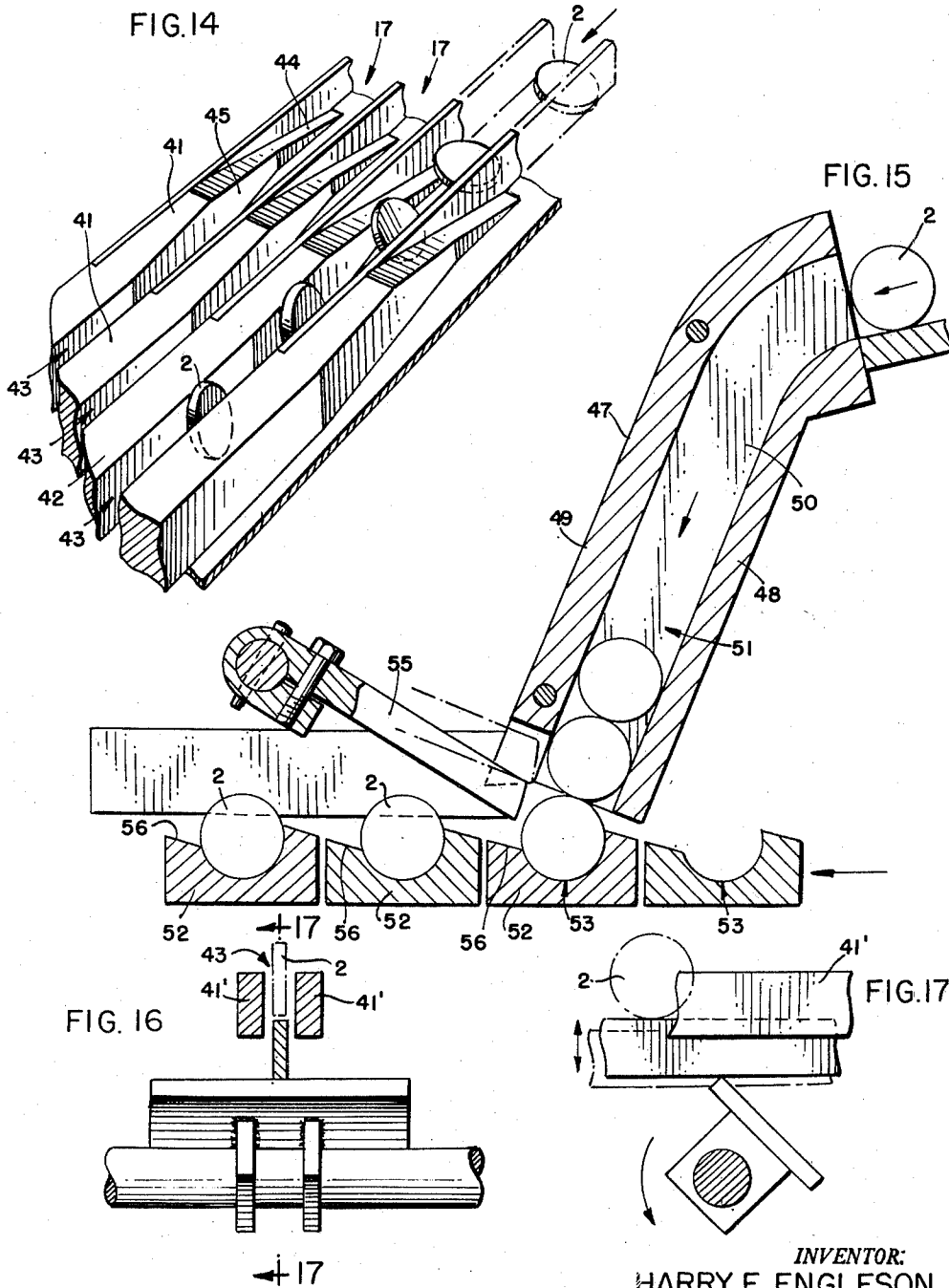
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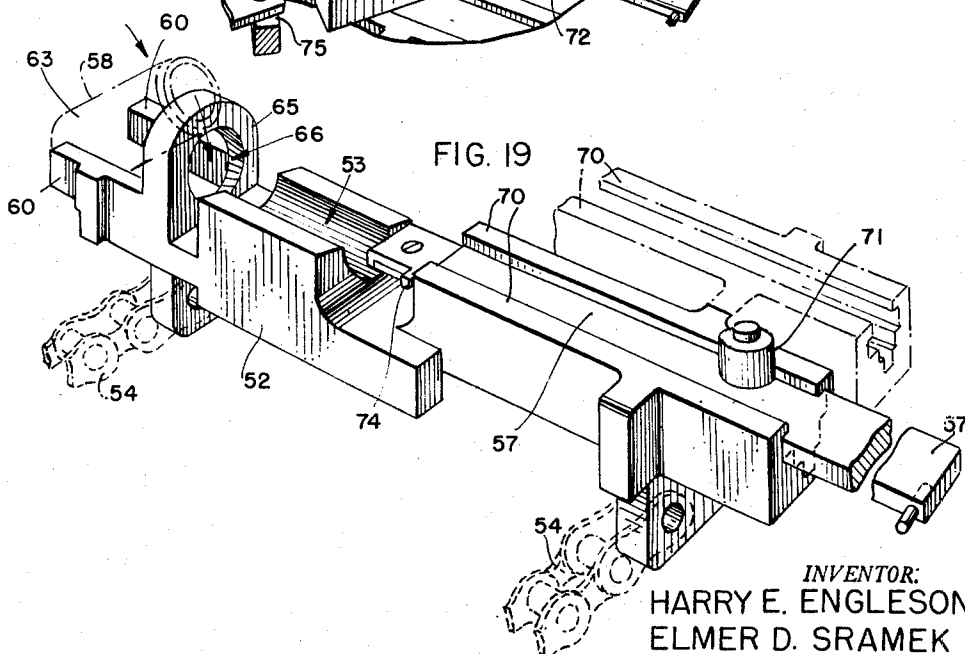
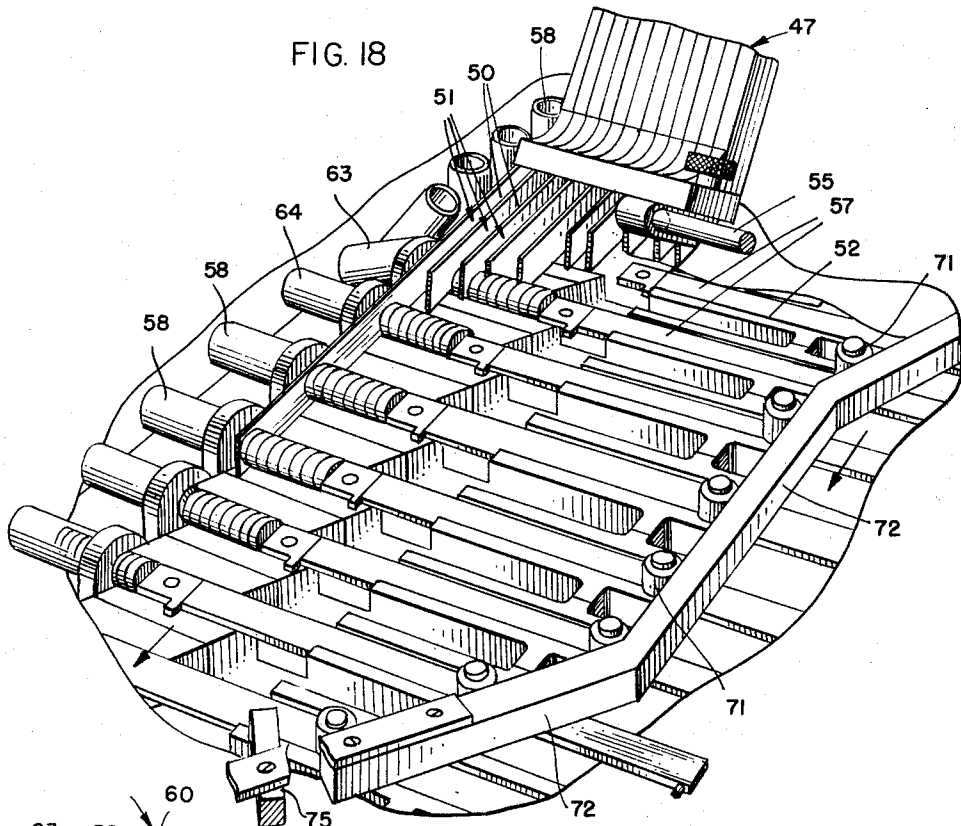
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TABLET BOTTLE FILLING MACHINE

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TABLET BOTTLE FILLING MACHINE

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FIG. 20

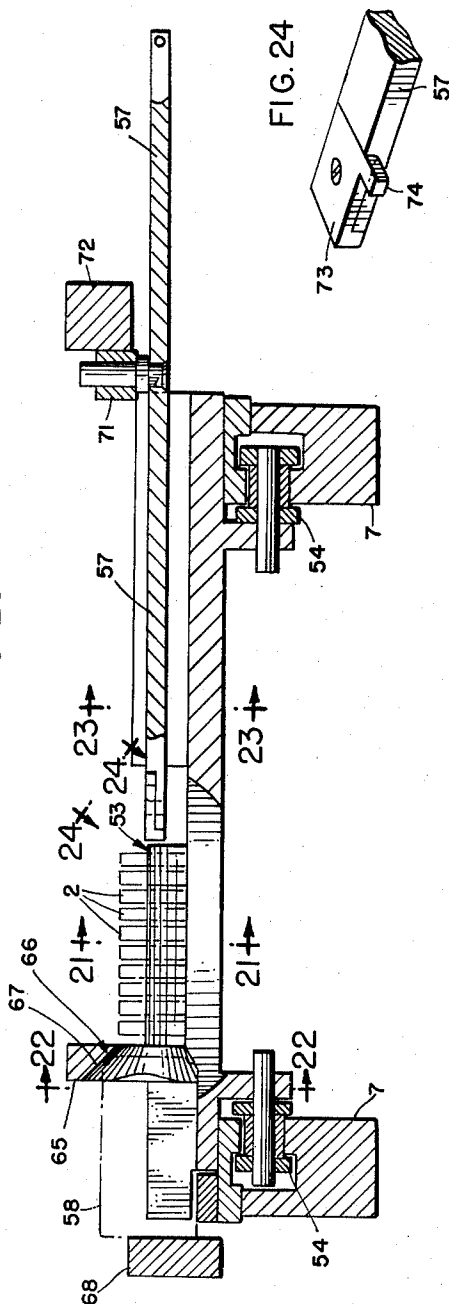


FIG. 24

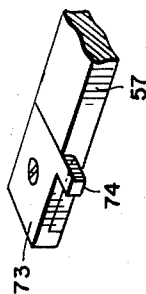


FIG. 23

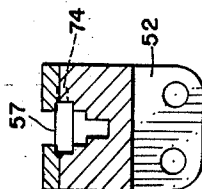


FIG. 22

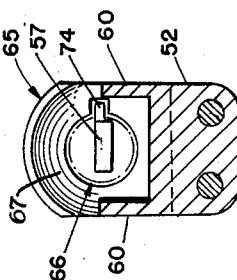
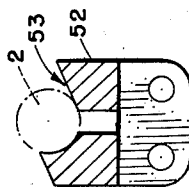


FIG. 21



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TABLET BOTTLE FILLING MACHINE

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Application May 14, 1954, Serial No. 429,783

20 Claims. (Cl. 53—159)

This invention relates to an apparatus, or a machine, for arranging articles, such as tablets, along certain predetermined paths for finally depositing the tablets in stacked relation in bottles.

The machine, or apparatus, of the invention comprises in general the positioning of tablets from a tablet making or forming machine to a single broad conveyor means where the tablets are arranged to conveying means, such as a pair of continuously operating belts, the tablets first being arranged flatwise in separate channels, which are so arranged and positioned that several individual rows (for being shown) of tablets are conveyed from each of the two conveyers. Means are provided to allow but one tablet in each row or channel to pass through a guide to cause the tablets to be turned vertically on their ends or edges. During the conveying of the tablets from the pair of conveyers to the eight line guides, certain jogging mechanism is provided to break up tablet jams to allow them to flow, or be conveyed, freely into the several channels. This latter mechanism comprises endless belts arranged on opposite sides of the conveyers and moving in a direction opposite to the direction of movement of the conveyers, there being certain jogger shoes which vibrate the belts to assist in preventing the tablets from jamming, clogging or piling. Means are also provided for holding back rows of tablets and then releasing the foremost tablet of each row, one at a time, to permit the tablets to flow freely downward along the tablet periphery or edge. The tablets are later gathered, one at a time from each row, in forward progressive movement until all tablets (eight being shown) are brought into axial alinement by means of collectors, for progressive insertion into a bottle. The bottles are fed to position first in upstanding arrangement, and then tilted on their sides, where they are progressively filled one after the other and then pushed and guided in upstanding position, resting on their bottoms, for delivery to a bottle capping machine.

The primary object of the present invention consists in the provision of new and improved means for directly receiving tablets from a tablet pressing or forming machine and conveying the tablets to a plurality of conveyers and then into a plurality of selective rows containing tablets arranged flatwise in a single line edge to edge. The tablets are later shifted from flatwise position to a vertical position standing on their peripheral edges, for later gathering and inserting in stacked on edge relation consecutively into bottles.

A further object of the invention consists in the provision of escapement mechanism, or means, for holding a line of tablets in position and then releasing one tablet at a time from each of several rows, where they are arranged into a gatherer or collector for shifting a plurality of tablets sidewise, but on their edges, and in contacting relationship for insertion into horizontally positioned bottles.

Another object consists in the provision of new and improved means for effecting a jogging or vibrating action

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along the sides of the conveyers so as to prevent jamming up or bridging of tablets, said means including endless belts having their reaches adjacent the conveyor sides, the belts moving in a direction opposite to the movement of the conveyers, the jogger element or means being arranged within the confines of the endless belts to break up tablet jams as the tablets move to single row channels.

A further object of the invention resides in the provision of new and improved means for progressively collecting or gathering a predetermined number of tablets for later arrangement in horizontal columnar form for insertion into horizontally positioned bottles.

A still further object of the invention resides in collecting a predetermined number of tablets which are moving progressively forward, and inserting the said predetermined number of tablets into bottles which are being progressively moved, the same mechanism conveying a plurality of tablets also carrying the bottles into which the tablets are to be inserted.

Still another object of the invention resides in new and improved means for moving bottles along a predetermined path, and then later shifting the articles out of said predetermined path for conveying to a bottle capper.

Numerous other objects and advantages will be apparent throughout the progress of the specification which is to follow.

The accompanying drawings illustrate a certain selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail perspective view of a tablet conveying and bottle filling machine and embodying the present invention, the tablet forming or pressing machine not being specifically shown;

Fig. 2 is a detail top plan view of a part of the machine, the same being shown adjacent the tablet forming machine;

Fig. 3 is a view similar to Fig. 2 but showing a forward extension of the machine, including a part of the filling and bottling apparatus;

Fig. 4 is a detail perspective view of certain operating parts of the machine, the view looking in the direction of the arrows 4—4 of Fig. 2;

Fig. 5 is a detail perspective view of some of the structure disclosed in Fig. 4, looking in the direction of the arrows 5—5 of Fig. 4;

Fig. 6 is a view similar to Fig. 5 but showing the tablet separators or escapement gates in downward position;

Fig. 7 is a detail sectional view on the line 7—7 of Fig. 2, and showing the manner in which the first tablet separator or gate holds back a column of tablets in a channel, the second separator or gate being in tablet released position;

Fig. 8 is a view similar to Fig. 7, showing the manner in which the first tablet separator or gate is released while the other separator or gate holds back the columns of tablets;

Fig. 9 is a detail diagrammatic plan view of the structure disclosed in Fig. 7;

Fig. 10 is a detail diagrammatic plan view of the structure disclosed in Fig. 8;

Fig. 11 is a detail vertical sectional view on the line 11—11 of Fig. 2;

Fig. 12 is a detail transverse sectional view on the line 12—12 of Fig. 2;

Fig. 13 is a detail longitudinal sectional view on the lines 13—13 of Figs. 2 and 12;

Fig. 14 is a detail perspective view looking in the direction of the arrows 14—14 of Fig. 3 and showing certain of the structure for causing tablets to be progressively shifted from flatwise position to on edge position;

Fig. 15 is a detail longitudinal sectional view on the line 15—15 of Fig. 3;

Fig. 16 is a detail longitudinal view looking in the direction of the arrows 16—16 of Fig. 3;

Fig. 17 is a detail transverse sectional view on the line 17—17 of Fig. 16;

Fig. 18 is a detail perspective view looking in the direction of the arrows 18—18 of Fig. 3, and showing some of the mechanism for arranging columns of tablets on end for insertion into bottles;

Fig. 19 is an enlarged fragmentary perspective view showing the construction of one of the elements embodied in Fig. 18;

Fig. 20 is a detail transverse sectional view on the line 20—20 of Fig. 3;

Fig. 21 is a detail transverse sectional view on the line 21—21 of Fig. 20;

Fig. 22 is a detail transverse sectional view on the line 22—22 of Fig. 20;

Fig. 23 is a detail transverse sectional view on the line 23—23 of Fig. 20; and

Fig. 24 is a detail perspective view looking in the direction of the arrows 24—24 of Fig. 20.

The particular construction herein shown for the purpose of illustrating the present invention comprises an actual machine which is in operation for conveying and transporting tablets from a tablet pressing or forming machine and finally inserting the tablets into columnar relationship, ejecting the tablets for insertion into a bottle while the bottle lies on its side, and then shifting the bottle upwardly, all in a continuous operation.

A rotary tablet press, or forming machine, 1, Fig. 2, forms tablets 2 which pass along a pair of guideways 3, 3 leading from the machine 1 for discharge onto a continuously moving, relatively broad belt conveyor 4.

The tablet press, or forming machine, forms tablets at a very rapid rate of speed, and has its drive independent of the drive of the rest of the conveying mechanism. The conveyers which receive the tablets are normally designed to operate at a speed somewhat greater than the rate of delivery of tablets from the press. However, the conveying mechanism is such that the speed of travel may be reduced or retarded. The length of the conveyor from the point where tablets are first deposited on the conveyor to the point where the tablets are to be arranged in separate rows or channels is such that a backlog of tablets may be built up if necessary. However, when it is found that a backlog of tablets is being built up, that is arranged behind the channels, the conveyor speed may be increased. This arrangement assures proper operation of the conveyor at all times, even though separate drive means are employed for the tablet press and the conveying mechanism.

The conveyor 4 is relatively short, terminating between a pair of delivery conveyers 5 and 6 which are mounted on the bottle filling machine frame 7.

A divider element 8, having a forwardly extending dividing guide 9, and horizontally inclined side guides 10 and 11 is provided for guiding the tablets 2 to the conveyers 5 and 6, Fig. 2. The side guide 10 deflects or guides certain of the tablets 2 from the single wide conveyor 4 to the conveyor 5, while the other side guide 11 guides or deflects other tablets 2 from the wide conveyor 4 onto the conveyor 6. The tablets 2 are thus conveyed along the conveyers 5 and 6 to certain guiding positions where they are to be arranged later in flatwise edge-to-edge relation in single lines. There are five guideways for each conveyor 5 and 6, but inasmuch as eight tablets only are to be bottled, one guide on each side is blocked off. Therefore, four guideways are shown in operation for the conveyor 5, and four such guideways for the conveyor 6. Brushes 12, 12 extend over and across each of the conveyers 5 and 6 to keep the tablets 2 from piling up, and to brush off any tablet which may become stacked on top of another.

Side members are arranged at opposite sides of the conveyers 5 and 6, Fig. 2. The side guides comprise a

pair of endless belts 13, 13, for each of the conveyers 5 and 6, there being a guide belt 13 on each side of each conveyor. Each guide belt 13 has its inside reach 14 facing the opposite side edges of each of the conveyers 5 and 6, the reach sides 14 of the endless belts 13 moving in a direction reverse or opposite to the direction of travel movement of the conveyers 5 and 6, thereby providing agitation for any tablets which may become assembled along the delivery conveyers 5 and 6, and thus keep the tablets from jamming up or bridging. Also, to assist in keeping the tablets from jamming or locking, agitator shoes 15, Figs. 2 and 4, are provided inwardly of each reach 14 of each belt 13. Each agitator shoe 15 is arranged immediately preceding certain thin guide strips 16, Figs. 2, 11 and 12, which define separate channels 17 into which the tablets 2 are to be arranged in single lines and in edge-to-edge relation.

Holder arms or bars 18, Figs. 2, 11 and 13, extend downwardly from a top cross bar 19, being spaced above the top of the delivery conveyers 5 and 6, and arranged between the guide strips 16 which define the tablet receiving channels 17. The holder arms or bars 18, for each delivery conveyor, have their bottoms spaced from the top of the conveyers a distance only slightly greater than the thickness of a tablet 2 to permit easy free passage of the tablets beneath the arms 18, but preventing the tablets from turning edgewise or canting, as well as preventing the tablets from becoming stacked one upon the other. These holder bars or arms 18 project forwardly a predetermined distance to keep each tablet in its flat position, Fig. 12.

Operable means, Figs. 2 and 4 to 13, are provided to separate a leading tablet 2 in each channel 17 from the next succeeding tablet of the same channel so that only one tablet at a time from each row or channel will be released. This operable means is located at a point just rearwardly of the termination of the holder bars or arms 18, and comprises a first separator bar or gate 20 and a second separator bar or gate 21, Fig. 2.

The separator gate or bar 20, Figs. 2 and 4 to 13, extends completely across all the channels 17 of both of the conveyers 5 and 6, Fig. 2, and is adapted to be oscillated in a vertical arc, being pivotally mounted to a rigid side journal 22 by means of end studs 23, Fig. 5. The bar 20 is operated by a vertically oscillating plate or member 24 engaging the tail piece 25 of the journal 22. The plate 24 raises the separator bar 20 when the plate 24 rocks downwardly to push down on the tail piece 25. The separator bar 20 is provided with a plurality of downwardly extending teeth 26, Fig. 5, there being two such teeth 26 projecting into the path of tablets in each channel 17. The teeth 26 are arranged adjacent the sides of each guide strip 16 of each channel 17. These teeth 26 are arranged relatively close to the guide strips 16 defining the channels 17, so that when a tablet arrives at a predetermined holding position, the teeth 26 will not strike and crush a tablet 2, because the teeth will be at each side of a tablet and at the forward end thereof. When the separator bar 20 is raised to release a tablet, Figs. 5 to 8, the separator bar or gate 21 will move downwardly to hold the released tablet. Thus, the forward edge of a tablet 2 in each channel 17 abuts against the teeth 26 and holds back the line of tablets in each channel; but when the separator bar 20 is raised, one tablet only will be released from each line, being engaged by a downwardly extending tooth 27 on the holder gate or bar 21, Figs. 7 to 9. The separator bar 21 has one tooth for each channel 17, each tooth being positioned at one side of a tablet of each row so as not to strike against the tablet.

The holder bar or gate 21 is also operated by the previously mentioned vertically reciprocating plate 24. The bar 21, Fig. 5, has arms 28 at its ends, and these arms are connected to end bearings 29, Fig. 5, freely mounted on an oscillating or cross rock shaft 30. The

arms 28 rest on top of the plate 24 and cause the bar 21 to be raised when the plate 24 is raised. When the plate 24 moves downwardly, the bar 21 is allowed to drop by gravity. The downward movement of the plate 24 raises the separator bar 20 because of the pressure on the tail piece 25. Therefore, when the bar 20 is raised, the bar 21 is lowered and vice versa, the separator bars 20 and 21 operating in proper timed relation, up and down.

The oscillating or rock shaft 30, Figs. 2 and 5, operates the bars 20 and 21 as the cross shaft 30 is rocked. This rocking of the cross shaft 30 also operates the agitating shoes 15. Each shoe 15 is pivotally connected on one end to a part of the base of the conveyor, and at its forward end is pivotally connected to an arm 31 which in turn is pivoted to an arm of a bell crank 32, the bell crank 32 being pivoted at 33 to a part of the frame. The arm 34, Fig. 4, of the bell crank 32 is pivotally connected to a link 35 which is pivotally connected to a crank arm 36 fixed to the cross shaft 30. The crank arm 36 is rocked by linkage 37, Figs. 2 and 4, from an operating part 38 of the machine, and inasmuch as the crank arm is fixed to the shaft 30, the shaft 30 will be rocked and provide alternate vertical reciprocation of the separator bars 20 and 21, as well as vibratory movement of the shoes 15. Vertical adjustment may be had of the separator arms 20 and 21, Figs. 5 and 6, by means of adjusting screws 39, 39 cooperating with the oscillating plate 24. The rock shaft 30, therefore, causes the arms 20 and 21 to be raised and lowered in a vertical arc, as well as causing lateral reciprocal movement of the agitating shoes 15 in a horizontal arc. Opposed shoes 15, one on each side of the conveyors 5 and 6, are connected together by arms or links 40, Fig. 4.

The first tablet 2 of each line in a channel 17, after being released by the separator arm 21, is moved along flatwise by the conveyors 5 and 6, as shown in the upper part of Fig. 3, where they come into engagement with cam bars or rods 41 arranged in each of the channels 17, Fig. 14. The cam bars 41 are relatively thick at their forward end, as indicated at 42, to define relatively narrow spaced guideways 43, Figs. 3 and 14, whereby the tablets 2 are turned ninety degrees, lying edgewise instead of flatwise, being free to roll along their peripheries. The cam bars or rods 41 are relatively thin at their forward ends, as indicated at 44, Fig. 14, and then gradually thicken out and slope upwardly, as indicated at 45, until they reach the full thickness 42, whereby the guideways or channels 17 are progressively narrowed. Therefore, as the tablets first come into engagement with the relatively sharp noses 44 of the cam members or rods 41, they will move from flatwise position to vertical edgewise position, as shown in Fig. 14. The tablets are now in a position to fall by gravity down an incline 46, Fig. 1, and roll along the bottom bars of the relatively narrow guideways 43, converging inwardly, as clearly shown in Figs. 1 and 3, where they fall into a chute 47, which has its channels 43 arranged in parallelism.

The bars 41, Fig. 14, may be long, extending up to the chute 47, but it is desirable from a manufacturing and erecting standpoint that separate bars 41' be used, as shown in Figs. 16 and 17. The tablets 2 are arranged on end in the guideways 43, being guided by the bars 41' resting on relatively loose fitting bottom supporting bars, as shown in Figs. 16 and 17. Inasmuch as the tablets may have rough edges, these bottom bars may be agitated by an agitator plate which strikes the bottoms of these bottom bars. The agitator plate is secured to a round rod as shown in Figs. 16 and 17 being rotated by a part of the operating mechanism of the machine. The agitator plate moves the bottom tablet supporting bars from the full line position to the dotted line position shown in Fig. 17, because of the loose connections of these bottom bars. The tablet support bar is operated,

as shown in Fig. 17, to make tablets roll, and to shake powder from the top surface of the bar.

The chute 47, Fig. 15, inclines downwardly relatively abruptly with a tablet in each channel 43 arranged in side-by-side relation in respective adjacent channels. The tablets fall downwardly in the chute 47, which includes a bottom 48, a cover member 49, and side guide strips 50 which form relatively narrow guide channels 51, Figs. 3, 15 and 18.

The guide strips 50 defining guide channels 51, Fig. 18, extend outwardly a predetermined distance from the bottom of the chute 47 proper, and are arranged in staggered or progressively lengthened condition, as clearly shown in Fig. 18. The tablets as they fall out of the chute 47, and being guided by the strips 50, are received in conveyor buckets 52, one tablet from each guideway or channel 51. The buckets 52, Figs. 15 and 18, pass beneath the chute 47 and are received in semicircular recesses 53, Fig. 15. The buckets 52 are hingedly connected together on each side by operating chains 54, Fig. 19, and are continuously moved forward along a predetermined path. The buckets, therefore in effect, comprise an endless conveyor which extends from the bottom of chute 47 toward discharge position.

Immediately forwardly of the discharge end of the chute 47 there is an oscillating or reciprocating arm 55, Fig. 15, which is arranged immediately forward of the inclined edge 56 of each bucket 52. This arm reciprocates in proper timed relationship so that when a tablet 2 is arranged on edge in a groove 53 of a bucket 52 it will be prevented from rebounding or tending to shift out of its groove 53. Were the arm 55 not used, tablets would carry along the inclined surfaces of the bucket under the left hand guides 49 and be crushed. The arm 55 holds the tablets in line in the chute and prevents such crushing. The progressively elongated dividing strips 50, as shown in Fig. 18, each carry a tablet on end, and while the tablets are arranged on end and in side-by-side relation they are moved inwardly by a pusher arm 57, Fig. 18, which moves progressively at a given rate of speed. As soon as a tablet 2 from the last guideway 51 (to the left, Fig. 18) reaches beyond the end of the last guide strip 50, all the tablets (eight being shown) will be arranged on end, and in side contacting relationship, ready for insertion into bottles 58, Figs. 3, 18 and 20.

The bottles 58, Fig. 3, are conveyed from a suitable source of supply being moved into position by a transfer wheel 59, Fig. 3, where they will be received consecutively into receiving openings between rigid side members 60; the bottle receiving openings may comprise an integral part of the buckets or holders 52, Fig. 19. The bottles 58 are delivered in upstanding position from the transfer wheel 59, having their bottoms resting on a suitable support and guided by a guide member 61, as shown in Fig. 3. A cam bar or rod 62 then causes the bottles 58 to be shifted progressively from upstanding position to a position on their sides, resting on a support for tilting them from the position shown at 63, Figs. 18 and 19, to a side position, as indicated at 64, Fig. 18, with the open end of the bottle facing the plunger element 57. Each bucket 52, Fig. 19, also includes a centering collar 65 having an opening 66, which corresponds with the bottle opening and is in direct alinement therewith. Each bucket 52 includes the means for supporting the tablets arranged side by side and resting on their ends, a plunger element 57 for shifting stacked rows of tablets laterally along the grooves 53, a centering collar 65 for the bottles 58, and a bottle conveying section 60. All the elements are movable at a predetermined correlated rate of speed so that the rows of tablets in the grooves 53 may be ejected and pushed progressively into the open ends of consecutive bottles, all in a continuous uninterrupted movement.

The outer surfaces of the centering collars 65 around the central openings 66 are relatively conical in shape,

as indicated at 67, Figs. 20 and 22. After the bottles 58 are arranged on their sides and forced into contacting engagement with the conical side edges 67, being pressed, Fig. 20, by springs 69, Fig. 3, each bottle will be tightly clamped in proper position in a centering collar 65, with the opening 66 in proper direct alinement with a horizontal stack of tablets 2 for insertion in the opening of the bottle by the ejector or pusher arms 57.

Each ejector arm or pushing rod 57, Fig. 19, is arranged between spaced flanges 70, 70 of the buckets 52 and is free for horizontal slidable movement. Each member 57, Figs. 19 and 20, carries a roller 71 near one end thereof, which roller is adapted to contact with a stationary cam bar 72, Figs. 3, 18 and 20. The cam bar 72 is of substantially the shape disclosed in Figs. 3 and 18, so that during movement of the conveying buckets 52 by the conveyor chains 54 the rollers 71 will engage the cam bar 72 and push the arms 57 inwardly. The shape, construction and angularity of the cam bar 72 is such that it provides for the proper amount of horizontal lateral movement of the members 57 with respect to the centering collars 65. Therefore, one part of the bar 72 (the upper end, Figs. 3 and 18) causes the plungers 57 to be shifted progressively inwardly, while the central or straight part maintains the plunger in non-movable position. The other end of the bar 72 (at the lower end, Fig. 18) inclines rapidly to effect faster movement of the plungers 57.

The pushers or ejectors 57, Fig. 18, move inwardly and push the horizontally stacked row of tablets 2 through the opening 66 in the centering collar, the end 73 of the pusher bars extending through the opening 66 and into the open end of the bottle to position the stack into the bottle, the bottle being of a diameter slightly greater, of course, than the diameter of the tablets so that the tablets will be received within the bottle. The diameter of the bottles, however, is still small enough to prevent any appreciable sideways shifting of the tablets within the bottle.

The ends of the pushers 73 bear against the tablets and thus push the bottles out of the buckets. The pusher or ejector elements 57 are provided with a projection or lip 74, Fig. 24, to permit contact or engagement with the rim of the bottle at the bottle opening, in such instances where there are insufficient tablets in the bottle, and thus push the bottles out of the buckets. The centering collar 65 is provided with a slot at the opening 66 to permit access of the lip 74 into and out of the collar.

Immediately after the horizontally stacked tablets are received fully with the bottle, a second cam bar 75; Figs. 3 and 18, arranged in proper position with respect to the cam bar 72, will cause the slide elements 57 to be shifted outwardly to retract the plungers away from the bottles and return them to original position. After the retraction of the plungers, the filled bottles will continue to move to discharge position, the bottles being caused to be turned to vertical position by certain bar cams arranged beneath the filled bottles. The filled bottles, in upright position, are adapted to be conveyed to discharge position to a bottle capping machine. The cam bar 75 is so constructed and operated that each member 57 will be slid back to original position so that they will again engage the forward end of the cam bar 72 after the cycle is completed.

The particular construction of the bucket conveyor and the manner in which the bottles are shifted and the tablets are positioned into the bottles are disclosed and claimed in applicants' copending application (case 140) assigned to the present assignee.

The operation of the various elements having been described throughout the specification, it is believed that further description of the operation need not be made.

The invention provides means operating continuously from the time the tablets are made until they are put in

bottles and conveyed to a capping machine. The machine of the invention is positive and efficient in operation, its various parts are properly timed, and inasmuch as some of the materials would be likely to disintegrate, if not bottled quickly, the speed of operation and quick time from making to packaging is an important phase of the machine of the invention.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages and the right is hereby reserved to make all such changes as fall fairly within the scope of the following claims.

The invention is claimed as follows:

1. An article filling machine comprising a movable conveyor receiving disk-like articles as they are made, a plurality of conveyors to receive articles from the first conveyor, said plurality of conveyors being positioned parallel with and adjacent to the first conveyor, guide means to shift articles from the first conveyor to said plurality of conveyors, means for arranging the articles flatwise into separate rows one behind the other, operable means holding back all articles in each row when said operable means is operated, and a second operable means operable in timed relation with said first named operable means to release one article from each row simultaneously when said second operable means is operated.
2. A machine for packaging flat disk-like articles in a receptacle comprising a conveyor upon which articles are received on their flat sides, a plurality of conveyors to receive the articles from the first conveyor, said plurality of conveyors being positioned parallel with and adjacent to the first conveyor, guide means to guide articles from the first conveyor to the plurality of conveyors, and means to turn said articles on their ends, said last named means comprising a plurality of channels into which the articles in each channel are arranged on their sides, and cam bars in each channel to shift the articles from their flat side position and arrange them on their peripheral edges.
3. A machine for packaging flat disk-like articles in a receptacle comprising a conveyor upon which articles are received on their flat sides, a pair of conveyors to receive the articles from the first conveyor, said pair of conveyors being positioned parallel to and on opposite sides of the first conveyor, guide means to guide articles from the first conveyor to the plurality of conveyors, means to turn said articles on their ends, and means to gather a plurality of articles in horizontal stacked relation, said last named means comprising a plurality of buckets, means to deposit articles one at a time in each bucket, and means to shift a row of articles in a bucket at right angles to the directional movement of said conveyors.
4. A machine for packaging flat disk-like articles in a receptacle comprising a conveyor upon which articles are received on their flat sides, a pair of conveyors to receive the articles from the first conveyor, said pair of conveyors being positioned parallel to and on opposite sides of the first conveyor, guide means to guide articles from the first conveyor to the plurality of conveyors, means to turn said articles on their ends, means to gather a plurality of articles on their ends and arrange them in horizontal stacked relation, and movable means to shift said articles in said stacked relation at right angles to the directional movement of the conveyors and deposit a horizontal stack of articles into a receptacle.
5. A machine for packaging flat articles in a receptacle comprising a conveyor upon which articles are received on their flat sides, a pair of conveyors to receive the articles from the first conveyor, said pair of conveyors being positioned parallel to and on opposite sides of the first conveyor, guide means to guide articles from the first conveyor to the plurality of conveyors, means to turn said articles on their ends, means to gather a plurality of articles in horizontal stacked relation, means to deliver open ended receptacles to article receiving

position with the receptacles lying on their sides, and means to shift articles in said stacked position into said receptacles.

6. A machine for packaging flat articles in a receptacle comprising a conveyor upon which articles are received on their flat sides, a pair of conveyers to receive the articles from the first conveyor, said pair of conveyers being positioned parallel to and on opposite sides of the first conveyor, guide means to guide articles from the first conveyor to the plurality of conveyers, means to turn said articles on their ends, means to gather a plurality of articles in horizontal stacked relation, means to deliver open ended receptacles to article receiving position with the receptacles lying on their sides, means to shift articles in said stacked position into said receptacles while said stacks of articles and said receptacles are being conveyed, and means for shifting said receptacles on their ends after the articles are received therein.

7. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a pair of moving conveyers receiving said articles flatwise from the first conveyor, said pair of conveyers being positioned parallel to and on opposite sides of the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, and guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise.

8. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, and means to prevent tablets on said latter conveyers from jamming up or bridging to permit the tablets to feed properly into said separate channels, said last named means comprising endless belts arranged on each side of each of said plurality of conveyers, said endless belts having their inner reaches moving in a direction opposite to the directional movement of the prior named conveyers.

9. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to prevent tablets on said latter conveyers from jamming and permit the tablets to be fed properly into said separate channels, said last named means comprising endless belts arranged on each side of each of said plurality of conveyers, said endless belts having their inner reaches moving in a direction opposite to the directional movement of the prior named conveyers, and vibrator means arranged adjacent said inner reaches of the belts to vibrate said belts.

10. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, and rigid bars positioned above

said plurality of conveyers in each channel to keep tablets from shifting upwardly.

11. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, and separator bars movable toward and away from said plurality of conveyers to hold back tablets in each channel and to release one tablet at a time from following tablets in each channel.

12. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, separator bars movable toward and away from said plurality of conveyers to hold back tablets in each channel and to release one tablet at a time from following tablets on each channel, and means to shift said tablets from flatwise position to a vertical position with the tablets standing on their peripheral edges.

13. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, and gathering means to gather one tablet from each channel and arrange them in separate guideways.

14. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, and gathering means to gather one tablet from each channel and arrange them in separate guideways, said gathering means including a divided chute forming separate guideways into which articles standing on end are received.

15. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, gathering means to gather one tablet from each channel and arrange them in separate guideways, and a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway.

16. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, gathering means to gather one tablet from each channel and arrange them in separate guideways, a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway, and means for shifting said articles in each guideway into horizontally arranged stacks.

17. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, gathering means to gather one tablet from each channel and arrange them in separate guideways, a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway, means for shifting said articles in each guideway into horizontally arranged stacks, and a plunger carried by each bucket and engaging a stack of articles for insertion into a receptacle.

18. A machine for conveying tablets and inserting the tablets in stacks or groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a position standing on end, gathering means to gather one tablet from each channel and arrange them in separate guideways, a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway, means for shifting said articles in each guideway into horizontally arranged stacks, means for moving bottles at the same speed as the movement of the bucket conveyor, and plunger means carried by each bucket to push stacks of articles consecutively into successively positioned moving bottles positioned on their sides.

19. A machine for conveying tablets and inserting the tablets in groups comprising a moving conveyor receiving tablets continuously from a tablet forming machine with the tablets lying flatwise on the conveyor, a plurality of moving conveyers receiving said articles flatwise from the

first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a vertical position standing on edge, gathering means to gather one tablet from each channel and arrange them in separate guideways, a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway, means for shifting said articles in each guideway into horizontally arranged stacks, means for moving bottles at the same speed as the movement of the bucket conveyor, plunger means carried by each bucket to push stacks of articles consecutively into successively positioned moving bottles positioned on their sides, means to retract said plungers after the bottles are filled, and means to shift said bottles to stand vertically and resting on their bottoms.

20. A machine for receiving tablets from a tablet forming press and delivering said tablets at a predetermined rate of speed, conveying mechanism embodying drive mechanism normally movable at a rate of speed capable of handling tablets faster than said rate of speed and adapted to be reduced in speed to a rate slower than said rate of speed comprising a tablet receiving conveyor upon which tablets are received from the machine flatwise, a plurality of moving conveyers receiving said articles flatwise from the first conveyor, guide means to guide articles from the first conveyor onto said plurality of conveyers, guide means to guide articles on each of said latter conveyers into separate channels whereby tablets are conveyed in rows flatwise, means to shift tablets in each channel from flatwise position to a vertical position standing on edge, gathering means to gather one tablet from each channel and arrange them in separate guideways, a moving bucket conveyor comprising a plurality of movable connected buckets receiving one tablet from each guideway, means for shifting said articles in each guideway into horizontally arranged stacks, means for moving bottles at the same speed as the movement of the bucket conveyor, plunger means carried by each bucket to push stacks of articles consecutively into successively positioned moving bottles positioned on their sides, means to retract said plungers after the bottles are filled, and means to shift said bottles to stand vertically and resting on their bottoms.

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