Dec. 15, 1942. E. E. LASKO 2,304,932

APPARATUS FOR INSERTING PACKING IN CONTAINERS

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Fig. 1.

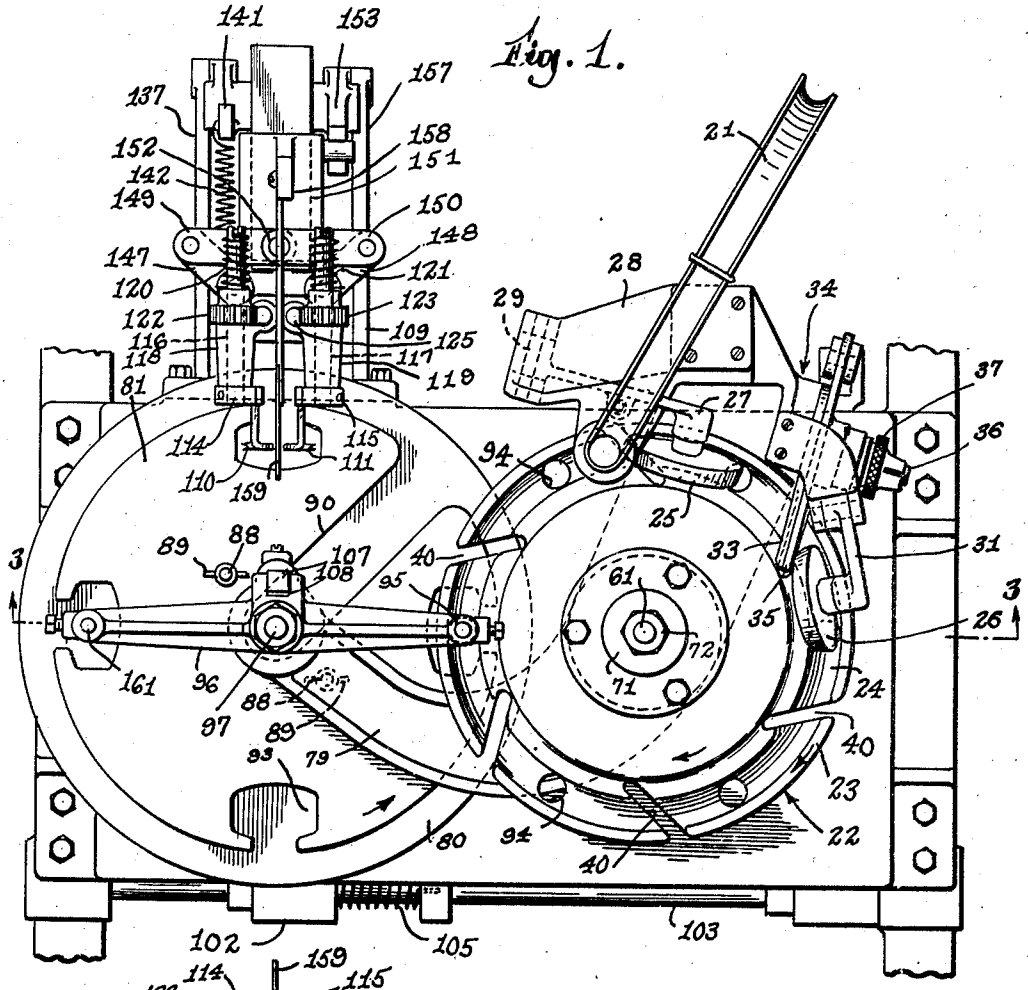


Fig. 9.

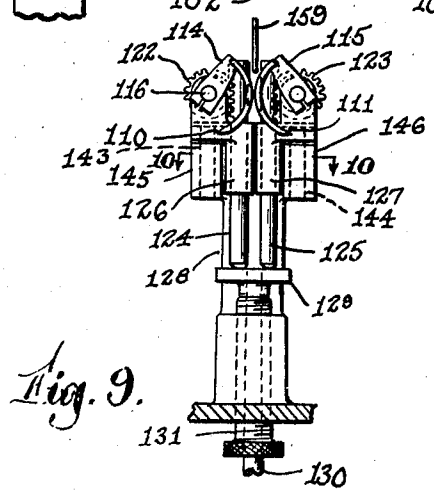
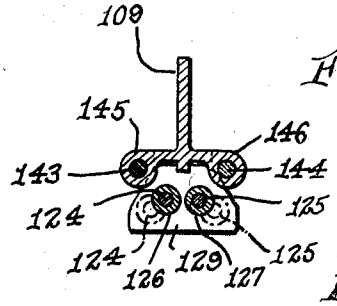


Fig. 10.



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Fig. 1.

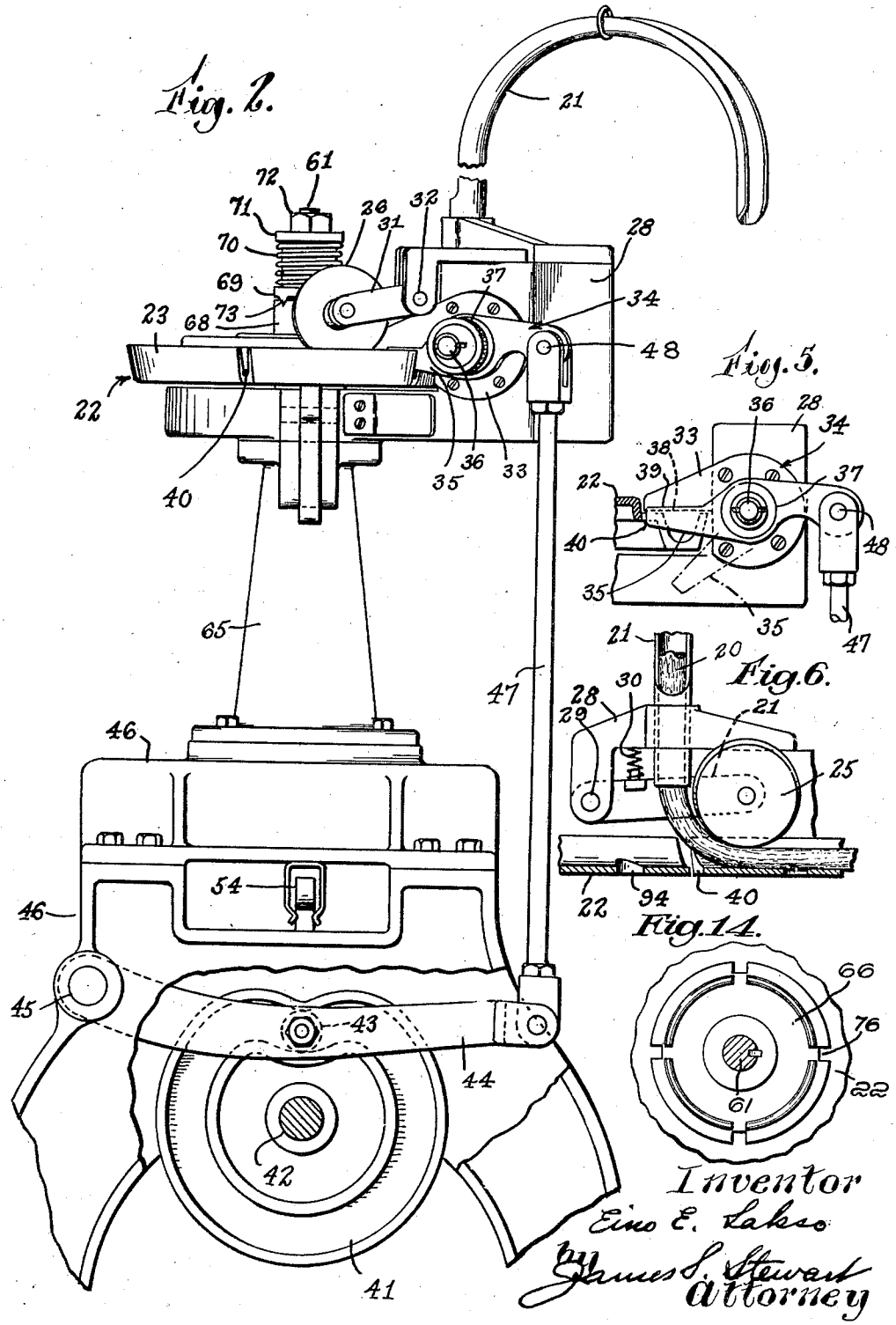


Fig. 5.

Fig. 6.

Fig. 14.

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Fig. 3

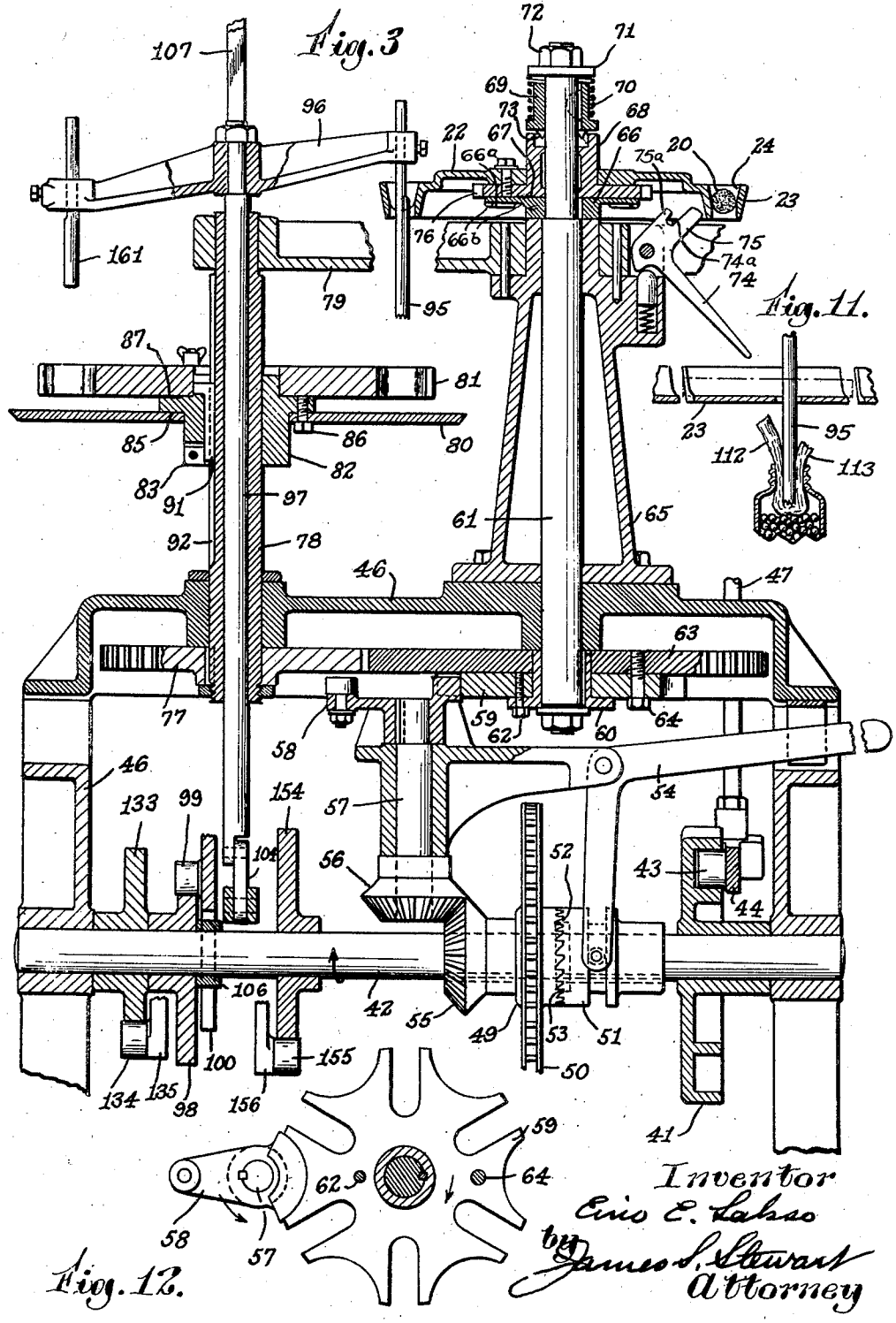


Fig. 11.

Fig. 12.

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Fig. 4.

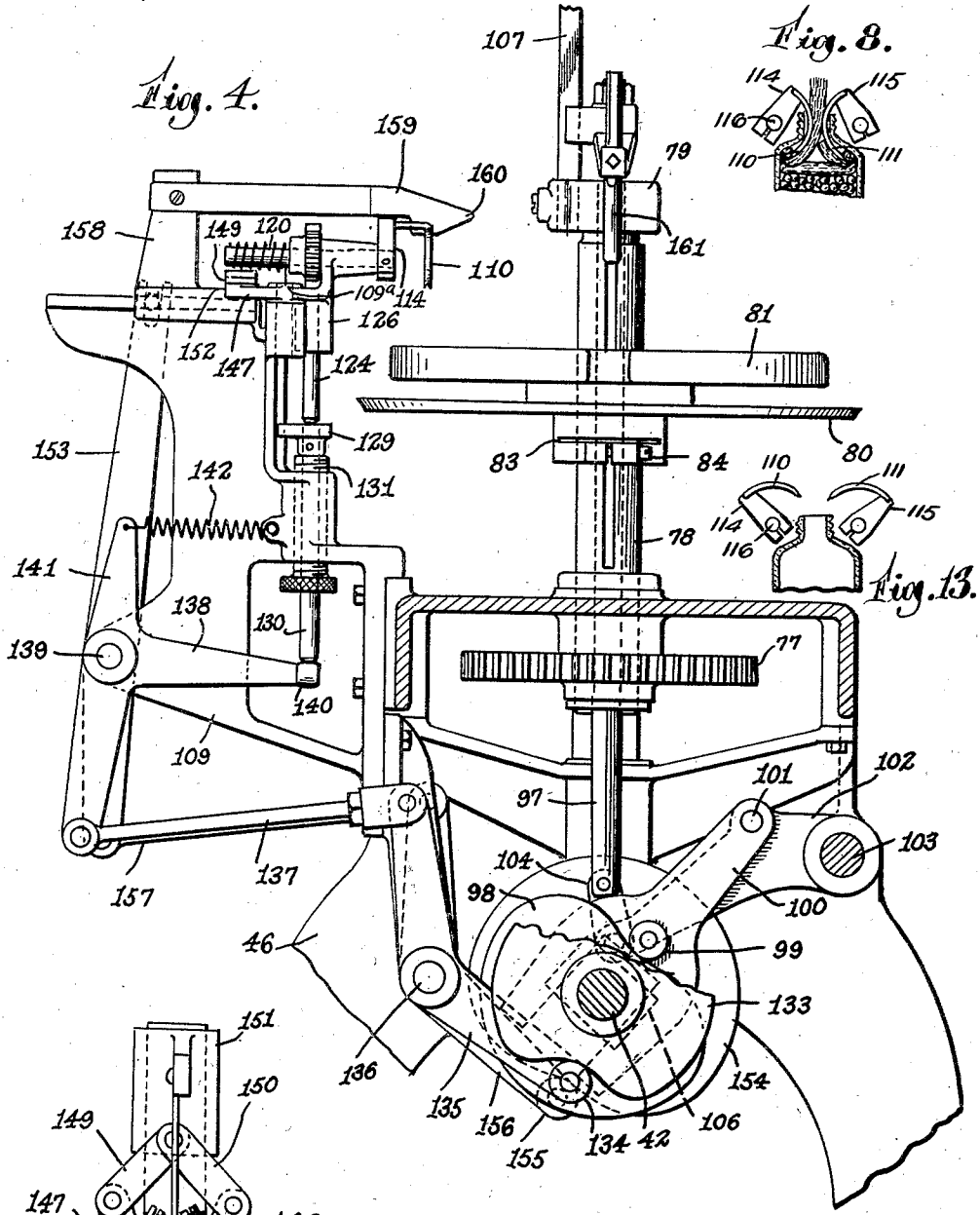
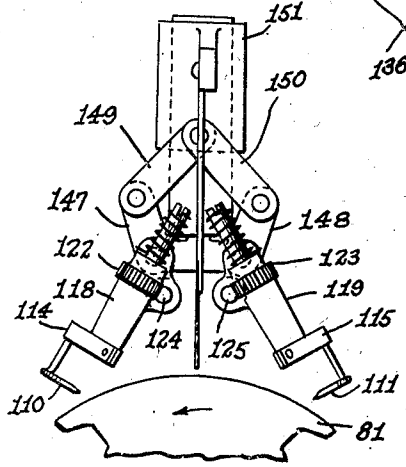


Fig. 8.

Fig. 13.

Fig. 7.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR INSERTING PACKING IN CONTAINERS

Eino E. Lakso, Fitchburg, Mass.

Application September 1, 1939, Serial No. 293,019

7 Claims. (Cl. 226—2)

This invention relates to a machine for inserting packing in containers, and more especially to a machine for inserting fibrous packing material in the ends of bottles or the like containing pills or other dry materials, so that the latter may be held against motion during transportation or handling of the bottles.

In certain aspects the invention relates to improvements over my copending application, Serial No. 184,051, filed January 8, 1938, now Patent No. 2,269,722, dated January 13, 1942, wherein there is described a method of inserting fibrous packing in containers and a machine capable of carrying the novel features of the method. In accordance with the disclosure in the application, the fibrous material is positioned above the open end of a container, advanced into the end thereof and finally spread out over the container contents.

The general object of the present invention is to bring about a form of power driven machine wherein the packing in the form of an endless strip may be automatically cut into pieces of predetermined length and each length advanced synchronously with the feeding movement of the bottles or the like to be inserted into the bottle neck and spread out over the bottle contents.

A feature of the invention relates to a type of machine adapted for use in the insertion of packing into containers of various sizes and in accordance with the spaces to be filled therein.

To these and other ends the invention relates to the novel features and combinations of parts to be hereinafter fully described and claimed.

In the drawings,

Fig. 1 is a plan view of a preferred form of the invention;

Fig. 2 is an elevational view of the machine taken from the right hand end as shown in Fig. 1 and showing particularly the mechanism for cutting the packing to desired length, the remainder of the machine being omitted to avoid confusion;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1, certain of the parts being omitted to avoid confusion;

Fig. 4 is an elevation view taken from the left end of the machine as viewed in Fig. 1 partly broken away and showing the mechanism for feeding the containers together with the mechanism for inserting the packing therein, the carrier for the packing as shown in Fig. 2 being omitted to avoid confusion;

Fig. 5 is a fragmentary view showing the mechanism for cutting the fibrous packing to predetermined length;

Fig. 6 is a fragmentary view showing the mechanism for leading the continuous strip of packing material onto the carrier for the same;

Fig. 7 is a fragmentary plan view of the mechanism for spreading the packing over the container contents, the mechanism being positioned to permit the passage of the container during the feeding movement of the latter;

Fig. 8 is a fragmentary elevational view of the mechanism shown in Fig. 7 in the position wherein the fibrous packing material is spread over the contents of a bottle;

Fig. 9 is a front elevational view of the mechanism for spreading the packing over the contents of a bottle and under the shoulders thereof;

Fig. 10 is a cross-sectional view taken along line 10—10 of Fig. 9;

Fig. 11 is a fragmentary elevational view in section and showing a container during the act of transferring the packing from the packing carrier and inserting the same in a container;

Fig. 12 is a fragmentary plan view of the mechanism for effecting an intermittent motion of the carrier for the packing and the carrier for the containers;

Fig. 13 is an elevational view similar to Fig. 8 but showing the mechanism for spreading the packing as withdrawn from the container, and

Fig. 14 is a view of the underside of the carrier for the packing.

In its preferred form the present invention contemplates a type of machine into which the packing is fed in the form of a continuous strip of fibrous material, the continuous strip being cut into strips of predetermined length, each strip being advanced by a carrier synchronously with the movements of the bottles or other containers until the strips are successively positioned over the open ends or necks of the containers, whereupon, through the instrumentality of synchronized feeding mechanisms, the strips are successively withdrawn from the carrier, inserted into the ends of the containers, and spread out over the contents thereof. To this end the continuous strip of fibrous packing material 20 is fed from a container (not shown herein) through a chute 21 to a carrier, generally designated by the numeral 22, the packing carrier, as shown, consisting of a disc-like plate 23 rotated about a vertical axis and provided, near its peripheral edge, with a packing receiving groove 24, into which groove the strip 20 is pressed by spaced feed rolls 25 and 26. The feed roll 25 is mounted for free rotation on the outer end of an arm 27, pivoted on a bracket 28 at 29 and extending for-

wardly in the direction of travel of the packing, the arm 27 being urged downwardly by a spring 30 to bring the roll 25 into contact with the strip of packing material. Roll 26 is mounted for free rotation on the outer or free end of arm 31, the latter being pivotally mounted on bracket 28 at 32 and extending forwardly in the direction of travel of the packing. Initially, the rolls 25 and 26 are raised and the packing passed thereunder, the rolls pressing the strip of packing material into the groove 24 with sufficient pressure to insure that the packing will be fed through the chute and carried along with the carrier.

The arms 27 and 31, as well as the chute 21, are supported on the bracket 28 which also serves to support the stationary blade 33 of the shears 34, the blade 33 extending over the upper surface of the carrier above the groove 24 in a position between the rolls 25 and 26 and, in this instance, closely adjacent the roll 26. The movable blade 35 of the shears is mounted for oscillatory motion on a stud 36 extending outwardly from the bracket 28 through the stationary blade 33, a nut 37, on the stud, bearing against the movable blade and providing for a proper tension between the blades, such that the cutting edges 38 and 39 thereof may cooperate to sever the strip. It will be noted that the disc 23 is slotted at spaced points along its peripheral edge, as at 40, to provide clearance for the movable blade 35 during the cutting of the strip, the motion of the blade 35 being produced by a cam 41, fixed on and rotating with the main drive shaft 42, the cam follower 43, of which, is mounted on lever 44, pivotally supported at one end, as at 45, on the main frame 46, the lever at its opposite end being connected to a link 47, which in turn is connected to the outer end of the blade 35, as at 48. The cam 41 is so shaped that the shears remain in open position during the rotary motion of the carrier 22 and are closed when the carrier is stationary. The open position of the movable blade 35 is shown in dot and dash lines in Fig. 5, in which position, it will be noted, both blades clear the carrier to permit rotation of the same.

The main shaft 42 is driven by suitable means, such as a sprocket 49 and chain 50, the sprocket 49, during the operation of the machine, being engaged by a clutch 51, splined on the shaft 42 and having teeth 52 thereon brought into engagement with the teeth 53 on the sprocket by the control lever 54. A bevel gear 55 keyed on shaft 42 meshes with bevel gear 56 secured on the lower end of and driving vertical shaft 57, the latter having the driving element 58 of a Geneva stop mechanism (Fig. 12) keyed to its upper end, the wheel 59 of the stop mechanism being mounted on a sleeve 60 keyed to the lower end of vertical shaft 61, the wheel 59 in this case being secured to the sleeve for common rotation by screw 62. Also received on the sleeve 60 and resting on the upper face of the wheel 59 is a gear 63, fixed to rotate with the wheel 59 as by screw 64 which passes through the wheel 59 and is threaded into the gear.

The vertical shaft 61 extends upwardly through the vertical standard 65, fixed on the frame 46, and serves to support at its upper end a disc-like element 66 keyed to the shaft, the radial face 67, on the under side of hub 68 of carrier 22 resting on the element 66. Splined on the upper end of the shaft 61 and pressed into engagement with the upper end of the hub 68 is a sleeve 69 having at its lower end a shoulder against which one end of compression spring 70 bears, the other end of the spring bearing against the washer 71 held on the upper end of shaft 61 by nut 72. A number of V-shape projections 73 on the lower end of the sleeve 69 are normally received in similarly shaped recesses in the upper end of the hub of the carrier 22. It will be apparent without further description that the hub of the carrier and thus the carrier itself is free to rotate on shaft 61 but is caused to rotate therewith by the engagement of the projections 73 and recesses in the upper end of the carrier hub, through the intermediary of the compression spring 70 and sleeve 69. A control lever 74 pivoted at the upper end of the standard 65 is provided with an arm 75 which may be swung into engagement with any one of a number of spaced slots 76 in the peripheral edge of the flange like lower end of the hub of the carrier to arrest the rotation of the carrier.

In order that the motion of the carrier 22 will be properly synchronized with the motion of the carrier for containers, to be hereinafter described, the lever 74 is provided with an arm 75*a* which, when the lever is moved into position to arrest the motion of the carrier, engages the downwardly depending annular peripheral flange 66*a* on the element 66, until the arm 75*a* is opposite one of the slots 66*b*, formed in the flange 66*a*. When the arm 75*a* moves through any one of the slots 66*b*, the arm 75 may move into the corresponding slot 76 to arrest the motion of the carrier. It will be noted that the lever 74 is provided with a recess 74*a* between the arms 75 and 75*a*, the recess providing clearance for the flange 66*a* during the continued rotation of the element 66. When it is desired to start the carrier 22 into operation, the lever 74 is pressed outwardly and, as soon as the arm 75*a* thereon is opposite one of the slots 66*b*, the lever may move outwardly to release the carrier. At this time, the slots 76 of the carrier will be opposite the slots 66*b* and the carrier properly positioned with respect to its synchronization with the container carrier.

Meshing with gear 63 is a gear 77 keyed on the lower end of vertical hollow shaft 78 supported for rotation in the frame 46 and in arm 79 extending transversely of the machine from the upper end of standard 65, the hollow shaft 78 having mounted thereon and rotating therewith a disc-like container supporting table 80, and a container carrier 81. The table and carrier are both supported on the shaft 78 by means of sleeve 82 which is capable of adjustment axially of the shaft and is split at its lower end, as at 83, so as to be clamped in any position of adjustment by means of clamp screw 84. The sleeve is provided with a downwardly facing radial shoulder 85 on which the table 80 is secured by means of screws 86, and is provided with an upwardly facing radial shoulder 87 on which the carrier 81 is removably secured by means of the threaded studs 88 and winged nuts 89. A slot 90 extending inwardly from the peripheral edge of the carrier to the center thereof permits assembly and removal of the carrier with respect to shaft 78. The sleeve 82 is fixed to rotate with the shaft 78 by means of the feather 91 carried in the sleeve 82 and slidable in the axial groove 92 in the shaft.

Spaced around the carrier 81 are openings 93 shaped to receive the containers in which the packing is to be received and it will readily be understood by one skilled in the art that the carrier 81 for the containers and the carrier 22 for the packing are given an intermittent syn-

chronized movement through the Geneva stop mechanism, and the gears 63 and 77, the carrier for the containers, in this instance making ¼ revolution in the direction of the arrow of Fig. 1, while the carrier for the packing makes ⅙ of a revolution in the direction of the arrow thereon in Fig. 1. The containers are introduced into the openings 93 at the front of the machine, as viewed in Fig. 1, and the first ¼ revolution of the container carrier will advance the container into position wherein the container is under the packing carrier 22 intermediate the ends of one of the packing strips supported therein and below one of the vertical openings 94 spaced around the carrier 22 between each adjacent pair of slots 40 and at the bottom of the groove 24, the spacing of the openings 94 with respect to the adjacent slots 40 being such that each opening is closer to one of the slots 40 than to the other.

The strip of packing above the container positioned below the packing carrier 22 is simultaneously folded into two branches and moved downwardly through the aligned opening 94 into the container (Figs. 1 and 11) by means of the downwardly extending plunger 95, mounted at one of the ends of the spider 96 secured on the upper end of rod 97 extending downwardly through the hollow shaft 78. Owing to the unequal spacing of the openings 94 with respect to the slots 40, it will be apparent that the strip as folded will be provided with contiguous branches of unequal length (Fig. 11). The downward and upward reciprocating movements of the rod 97, and thus the plunger 95, are effected in proper synchronism with the movements of the carriers and, of course, when the latter are at rest, by means of the cam 98 fixed on shaft 42 and engaged by the roll 99 on yoke 100, the outer end of the latter being pivoted at 101 to lever 102. The lever 102 is pivoted on the rod 103, supported on frame 46, the outer or free end of the lever 102 being connected by link 104 to the lower end of rod 97. A coil spring 105 on rod 103 engages the lever 102 to constantly urge the latter in a direction to effect engagement of the cam follower or roll 99 with the cam 98, the yoke 100 at its inner end straddling and sliding on the block 106, through which shaft 42 passes and rotates. A guide 107 secured on and extending upwardly from arm 79 is slidably received in a groove 108 in the hub of the spider 96, the guide holding the spider and rod against rotation while permitting reciprocation of the rod in shaft 78. Upon withdrawal of the plunger 95 by the upward movement of rod 97 and spider 96 the packing is left in the end of the container substantially in the position shown in Fig. 11 of the drawings.

Mounted on the frame 46, rearwardly of the carrier 81, is a bracket 109 on which is mounted the mechanism for spreading the packing over the top of the container contents and under the container shoulders. In a general way the spreading of the packing is accomplished in a manner similar to that of the machine of my co-pending application, that is to say, by a pair of curved needles 110 and 111 having pointed ends which, during the rotation of the needles, engage the contiguous branches 112 and 113 of the packing (Fig. 11) and carry these branches into the container and laterally away from one another.

Herein the needles 110 and 111 are mounted on the arms 114 and 115 which arms are secured on the forward ends of horizontal shafts 116 and 117 supported for rotation in bearings 118 and 119 and rotated in one direction by coiled springs 120 and 121 telescoped over the shafts and connected thereto at their corresponding outer ends, the inner ends of the springs engaging lugs 109a on bracket 109. Pinion gears 122 and 123, mounted on and fixed to rotate with the shafts 116 and 117 respectively are driven by vertical racks 124 and 125 which racks extend downwardly through bosses 126 and 127, integrally formed with respect to bearings 118 and 119, the lower ends of the racks engaging the upper face 128 of the vertical slide 129. The slide 129 has a downwardly extending stem 130 mounted for vertical reciprocating motion in the bearing sleeve 131, threaded in the bracket 109 for vertical adjustment, the upper end of the bearing sleeve acting as a stop to limit the downward movement of the slide 129.

The movements of the needles 110 and 111 are synchronized with the movements of the carriers by means of a cam 133 fixed on and rotating with shaft 42 and engaged by a cam follower on roll 134 mounted on one end of bell crank lever 135, pivoted on the frame 46 at 136, the other end of the lever 135 being connected by link 137 to one end of the bell crank lever 138 pivoted to the bracket 109 at 139. The lever 138 is provided with an arm 140 engaging the lower end of the stem 130 and an arm 141 connected to a tension spring 142 whose other end is connected to the bracket 109, the spring 142 urging the levers 138 and 135 in a direction to maintain the roll 134 in contact with the cam 133. As the arm 140, of lever 138, is swung upwardly or downwardly by the cam 133, the racks 124 and 125 are reciprocated upwardly and downwardly by the slide 129, thus effecting oscillatory motion of the pinions 122 and 123 and, through the intermediary of the springs 120 and 121, oscillatory motion of the needles 110 and 111 into and out of the ends of the containers, the needles being moved into the containers by the springs and withdrawn by the positive motion of the racks and pinions.

In order to provide clearance for the containers, and particularly the packing inserted in the container ends, provision is made herein for swinging the needles 110 and 111 out of the path of movement of the containers during the intermittent rotary motion of the carriers. To this end the bearings 118 and 119 are pivotally supported for swinging movement about vertical axes by means of downwardly extending stems 143 and 144 attached to the bearings and received in the bosses 145 and 146 on the bracket 109, the bearings 118 and 119 also being provided with rearwardly and outwardly extending arms 147 and 148, each arm having a link pivoted thereon, herein designated by the numerals 149 and 150, the links being pivotally connected to one another and to the slide 151 at the upper face 152 thereof.

The slide 151 is mounted for sliding movement towards and away from the carrier 81 by a lever 153, pivoted on the bracket 109 on an axis coinciding with that of lever 138, the motion of lever 153 being effected by a cam 154, on shaft 42, which cam is engaged by a cam follower or roll 155 on one end of a lever 156 pivoted on frame 46 at 136, the other end of the lever 156 being connected to lever 153 by link 157.

As the slide 152 is moved away from the carrier 81, by the action of the cam 154, the links 149 and 150 swing the bearings 118 and 119 into the position shown more particularly in Fig. 7 wherein

the containers, together with the packing extending upwardly from the ends thereof, may clear the needles and their associated mechanisms. When the carrier 81 has completed its movement, the cam 154 effects motion of the slide towards the carrier 81, restoring the needles and their associated mechanisms into the position shown in Fig. 1 of the drawings, in which position the needles may again be actuated by the cam 133 to engage the packing in the container in place thereunder to further insert the packing and spread the same over the container contents.

Mounted on the integrally formed upwardly extending arm 158, of slide 152, and extending forwardly therefrom between the needles 110 and 111 is a relatively thin flat vertically disposed stripper 159 which, during the forward movement of the slide 152, passes between the contiguous branches of the packing and, when the needles are withdrawn from the container, supports the packing against movement out of the container. The stripper is somewhat pointed at its forward end 160 to facilitate its passage between the branches of the packing.

After the containers have been subjected to the action of the needles 110 and 111 the intermittent rotary movement of the carrier 81 brings the containers into position under the plunger 161 at the left hand end of spider 96, as viewed in Figs. 1 and 3, the downward movement of the spider, and thus the plunger 161, serving to further insert the packing into the containers or at least insure that no portion thereof remains above the open end of the container.

In the operation of the machine described above a carrier having suitable openings 93, to receive and support the particular style and size of container, is placed in position on the shaft 78 and the carrier, together with the table 80, adjusted vertically on the shaft to bring the open upper ends of the bottles into such vertical position that the needles 110 and 111 may enter and spread the packing over the contents thereof. If necessary the plungers 95 and 161 are adjusted upwardly or downwardly in the spider 96 to insure the insertion of the packing to the proper depth.

Variations in the sizes of the containers or the space therein to be filled by the packing are taken care of in the preferred form of the invention by the use of packing strips of varying cross-sectional size, those of small cross-sectional size being used for small containers and those of large cross-sectional size being used for large containers, or where larger spaces are to be filled. In any case the endless strip of fibrous material is led through the chute 21 and into the groove 24, of carrier 22, under the rolls 25 and 26. Upon the application of power to shaft 42 the machine is then set into operation, the shears 33 cutting the endless strip into pieces of uniform length during the intermittent rotary movement of the packing carrier.

As soon as the pieces of cut packing have been carried around by the carrier 22, into position wherein the same may be transferred into a container, one of the latter is placed in the opening 93, at the front of the machine, and the synchronized movement of carriers 22 and 81 will effect motion of the container and packing under the plunger 95, thence to the needles 110 and 111 and to the plunger 161. It will be understood, of course, that the feeding of the packing in the carrier 22 is automatic while, in the particular machine shown, a packed container is replaced by an unpacked container in the opening 93, at the front of the machine, each time the carrier 81 comes to rest during the intermittent rotary movement thereof.

As described above, the needles 110 and 111 are oscillated into and out of the containers through operating mechanisms including springs 120 and 121. Through the use of these flexible driving means the needles may be rotated far enough to spread the material over the contents of containers of greatly varying size. In the case of small containers the motion of the needles will be arrested as soon as the packing contacts the sides of the containers. The flexible driving means also insure against breakage of the needles, their associated mechanisms and the containers, in any case wherein the conditions for insertion of the packing are not normal. By adjustment of the threaded sleeve or bearing 131 upwardly or downwardly in the bracket 109, the downward movement of the racks 124 and 125, and thus the limit of motion of the needles during the insertion of the packing, may be controlled.

While I have shown and described a preferred embodiment of the invention it will be understood that the same is not limited to all the details shown but is capable of variation and modification within the spirit of the invention and the scope of the appended claims.

What I claim is:

1. In a machine for inserting packing in containers the combination of a movable carrrier adapted to receive thereon a continuous length of the packing, means for guiding the continuous length of the packing onto said carrier, a movable carrier for the containers disposed to bring containers thereon into alignment with the packing carrier during at least a part of the motion of the carriers, means for effecting a synchronized intermittent motion of the carriers, means forming an opening in said packing carrier, means for engaging and cutting the packing on the packing carrier said last named means working through said opening and means for transferring the severed length of packing material from the packing carrier into a container in alignment therewith when the motion of the carriers is arrested.

2. A machine for inserting fibrous packing in containers comprising a horizontally disposed rotatable disc, means for feeding a continuous strip of fibrous material onto said disc, means for cutting off successive pieces of fibrous material from the strip while supported on the disc, a rotatable carrier for containers disposed in overlapping relation to the disc, and means for simultaneously folding the pieces of fibrous material between their ends and transferring the same from the disc into containers on said carrier.

3. The combination in a machine for inserting relatively loose fibrous packing material into the ends of containers, of a support for the packing, a movable carrier for the containers, a separate plunger means for transferring the packing from its support into the open end of a container on the carrier, separate means for engaging the packing when supported in the end of the container and spreading the same over the container contents and means for effecting a synchronized intermittent motion of the carrier to present the containers successively to said first named means.

4. A machine for inserting relatively loose fibrous packing material into the ends of partially filled containers which comprises a rotatable disc

having an annular packing receiving groove therein, means for feeding a continuous strip of packing material into the groove of said disc, means intersecting a portion of the disc area occupied by the disc for cutting successive pieces of packing material from the advancing end of the strip while received in the groove, a support for the containers, means for advancing containers on the support into alignment with the pieces of cut packing material successively and means for transferring the pieces of packing from the groove into the container ends.

5. The combination in a bottle cottoning machine, of a rotatable disc-like carrier having means forming an upwardly facing peripheral groove therein, means forming an aperture in a wall of said groove, means for guiding a continuous length of cotton fibres into said groove, means for severing a strip of cotton fibres while it is supported in said groove, a support for the bottles and means for transferring the severed strips of cotton fibres directly from the carrier through the aperture into bottles on said support.

6. A machine for inserting loose fibrous packing material in the open ends of containers to hold the contents thereof against movement comprising a carrier supporting the containers in upright position, a movable carrier for a continuous length of packing material adapted to support the latter for horizontal movement across the open ends of successive containers, means for cutting successive packing units from the advancing end of the length of material, means forming apertures in the carrier, and means for engaging the units between their ends and transferring the same into successive containers through said apertures.

7. The combination according to claim 4 in which means is provided for engaging the packing when received in the container ends and spreading the same laterally over the container contents.

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