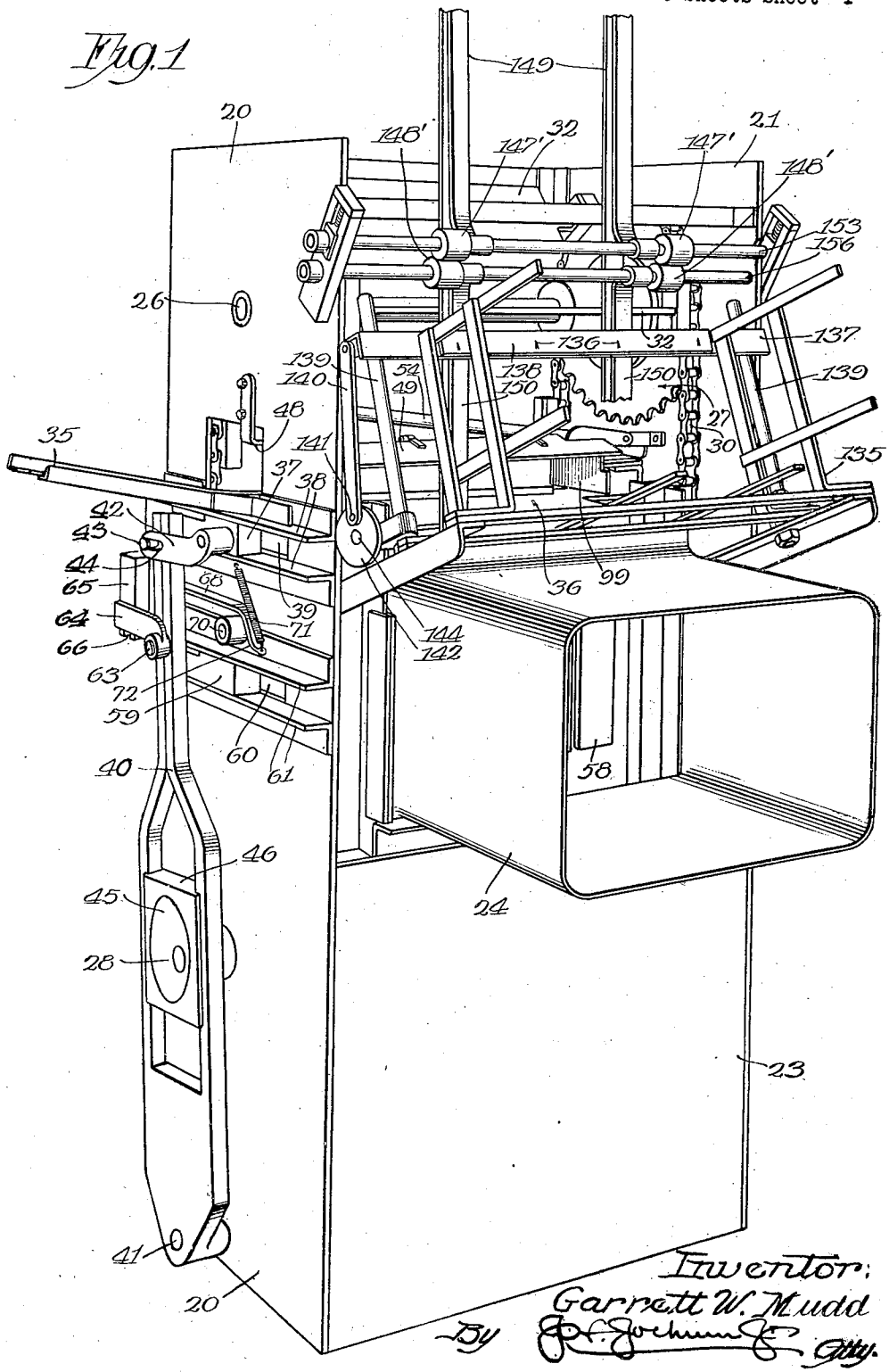
March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 1

Fig. 1



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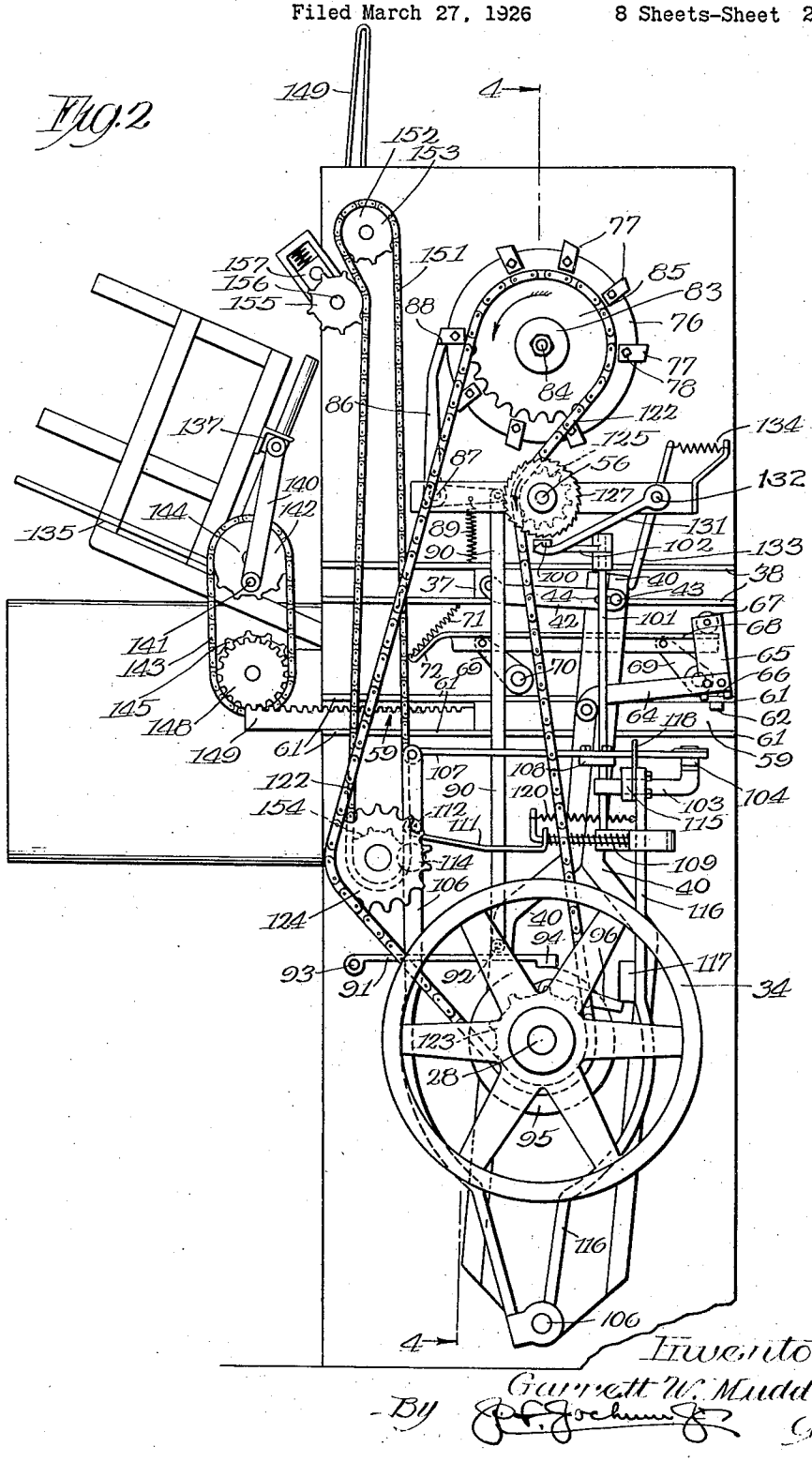
Garrett W. Mudd
By J. F. Jochum & Co. Atty.

March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 2

Fig. 2

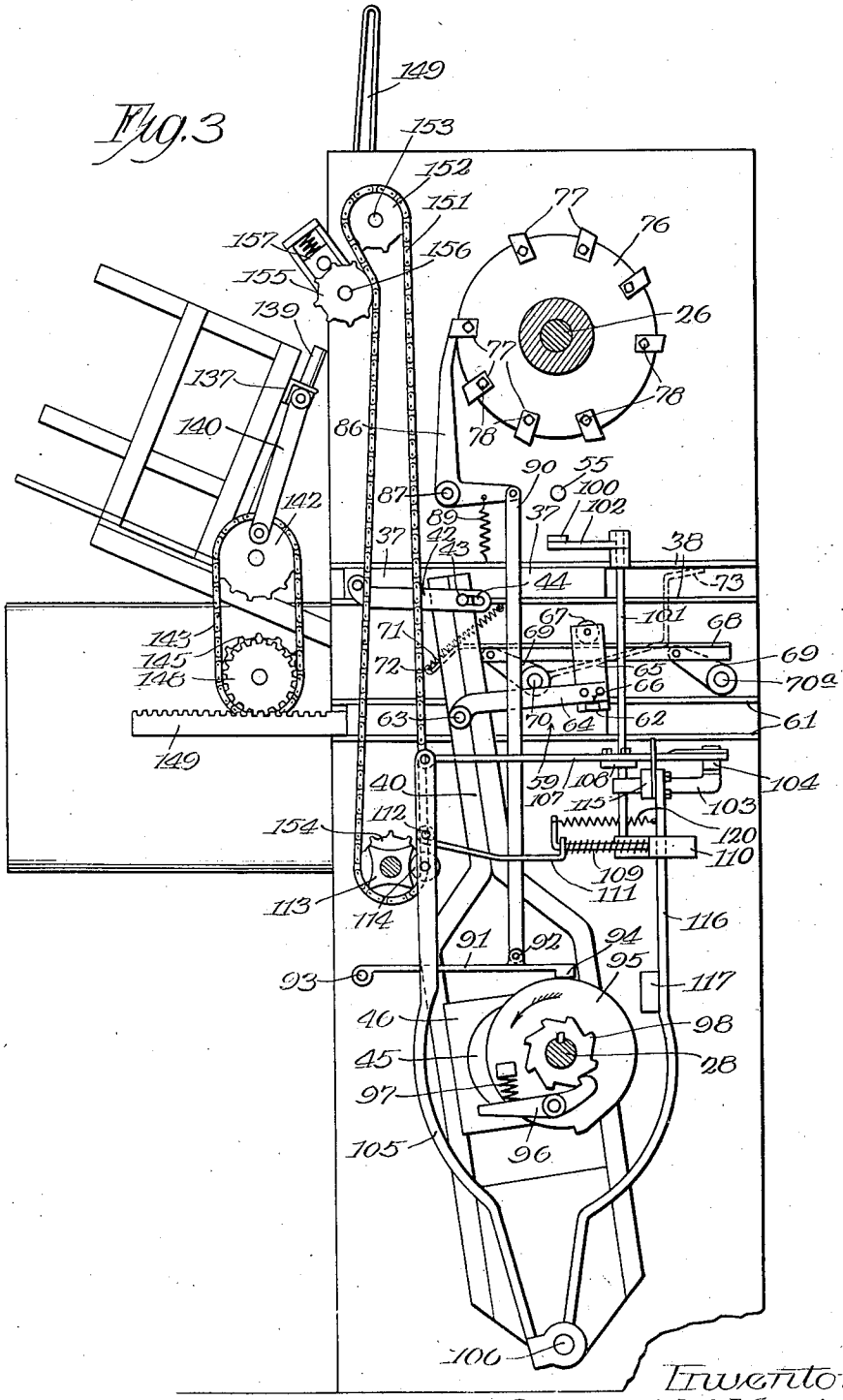


March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 3

Fig. 3



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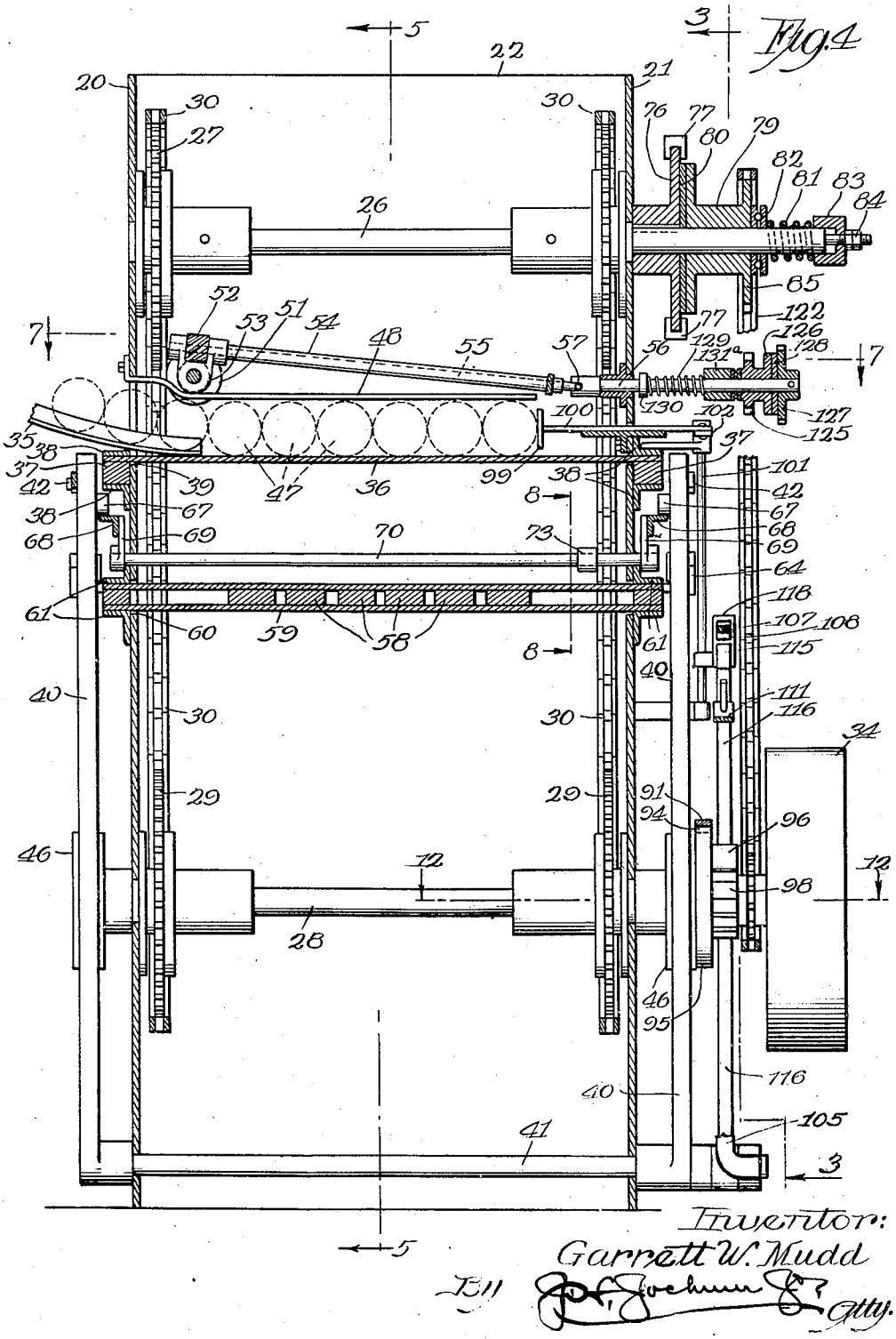
March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 4



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March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 5

Fig. 5

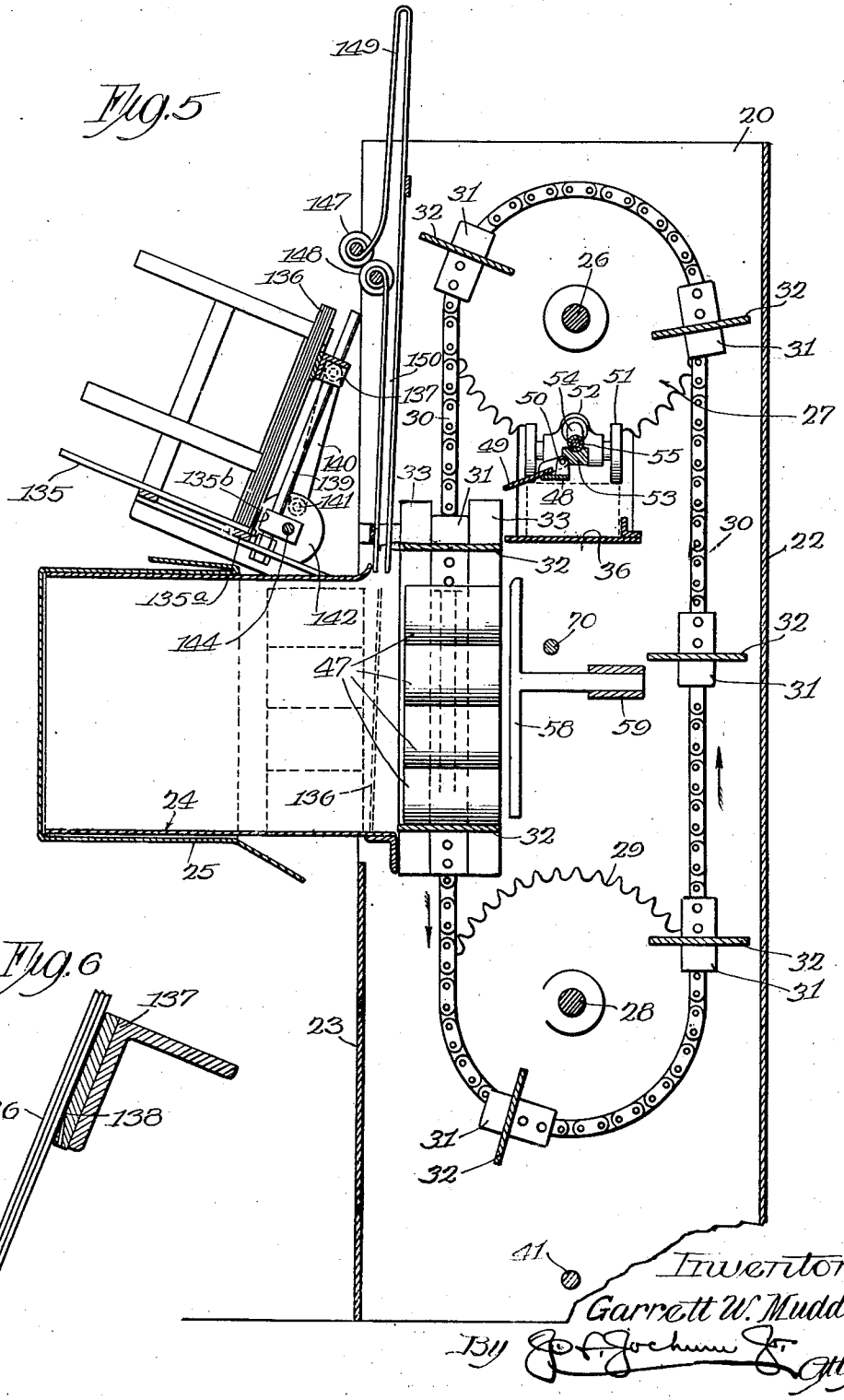
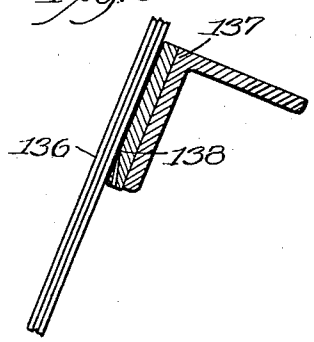


Fig. 6



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March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 6

Fig. 1.

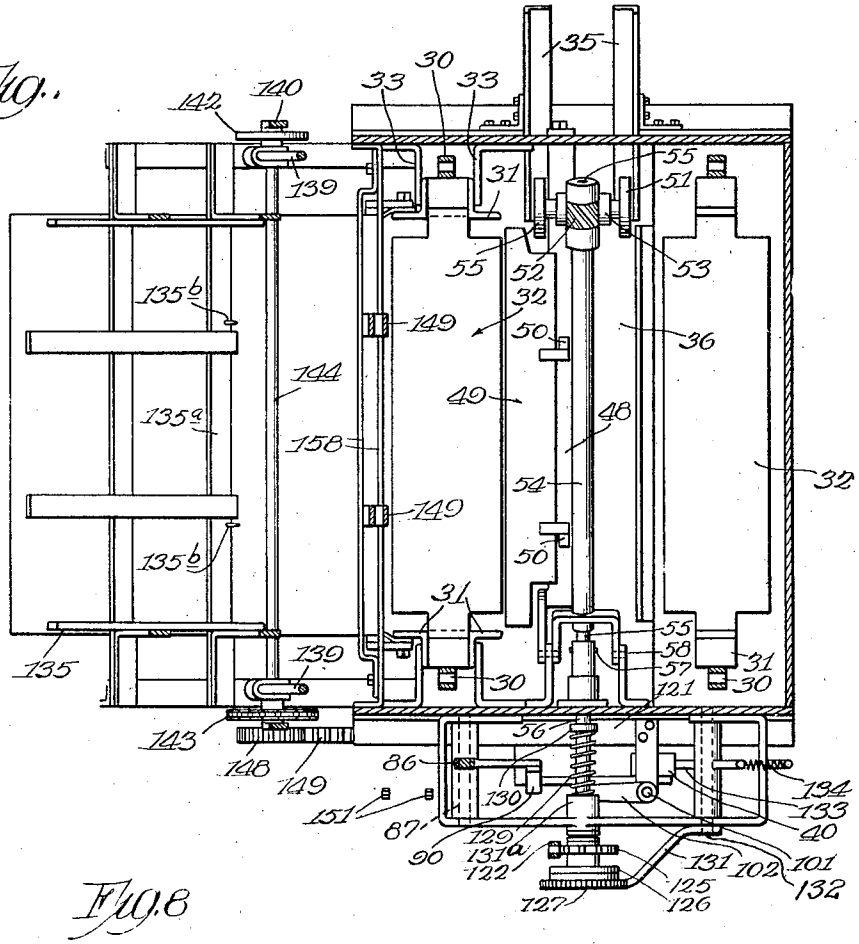


Fig. 8

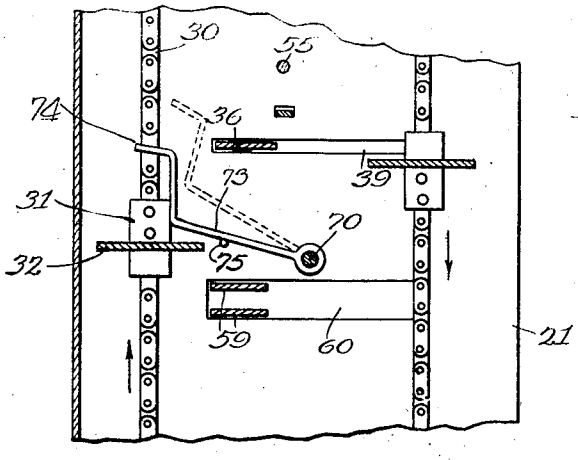


Fig. 9

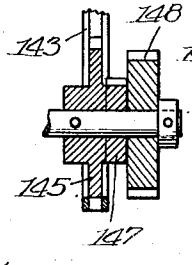
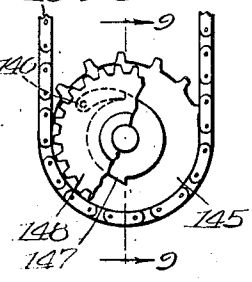


Fig. 10



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March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

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Fig. 11

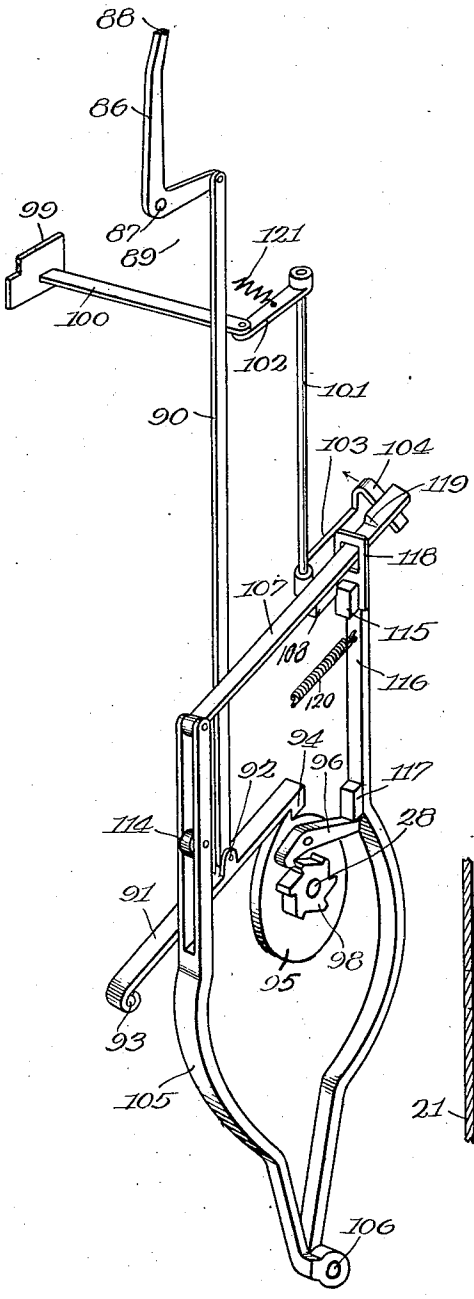


Fig. 12

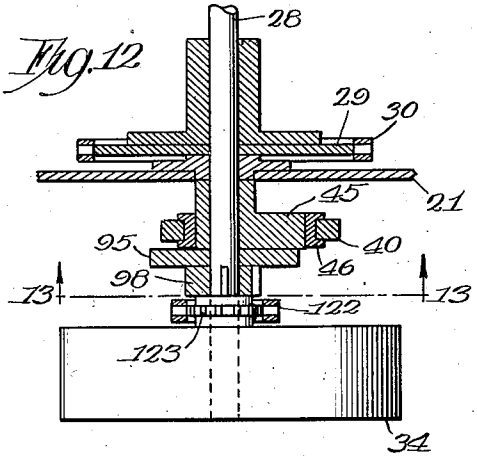


Fig. 13

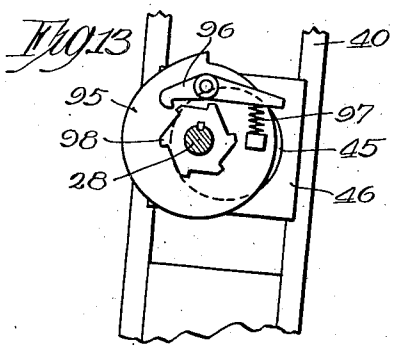


Fig. 14

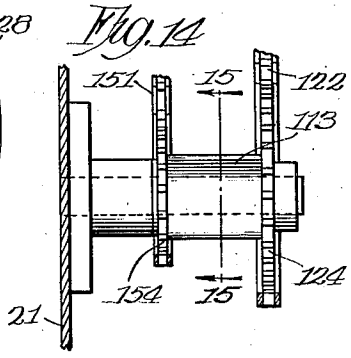
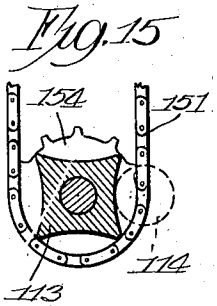


Fig. 15



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March 6, 1934. G. W. MUDD 1,950,370

PACKAGING MACHINE

Filed March 27, 1926 8 Sheets-Sheet 8

Fig. 17

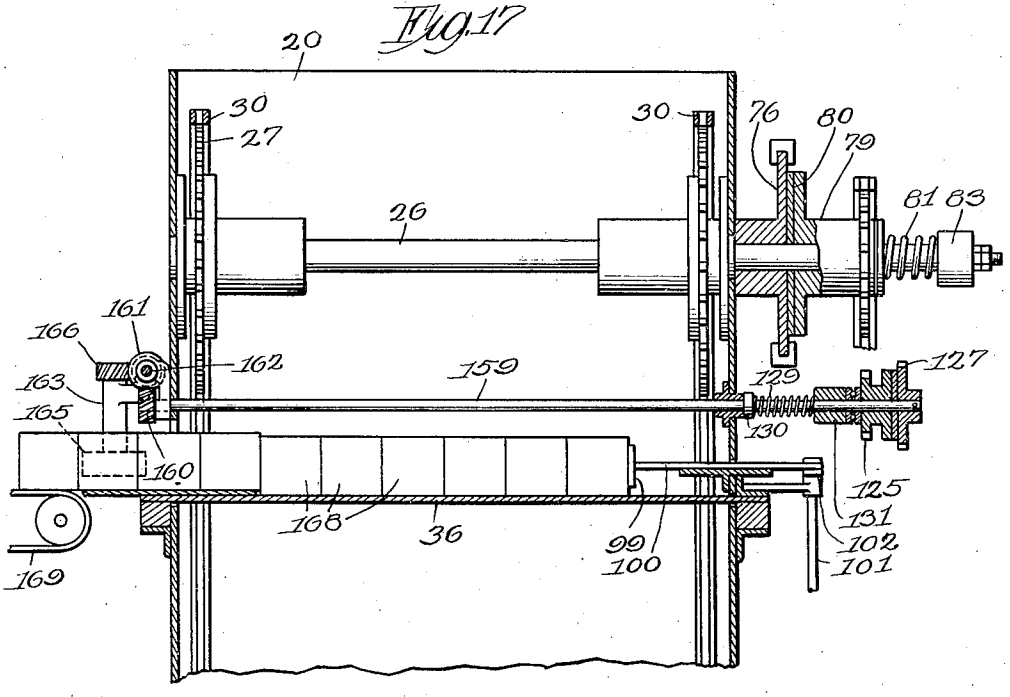
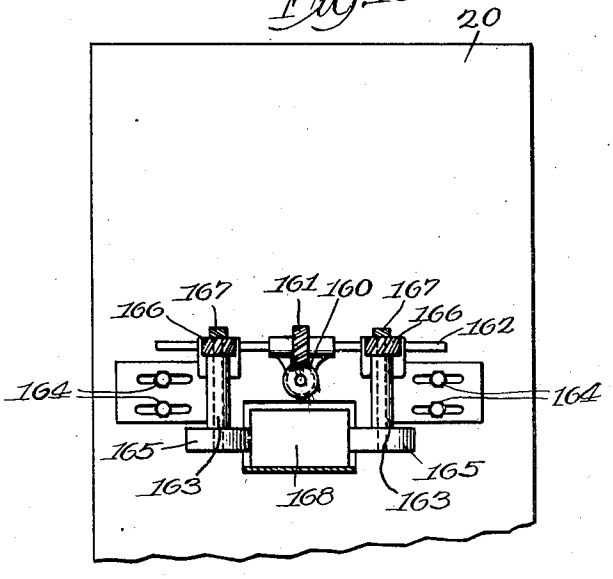


Fig. 16



Inventor
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Patented Mar. 6, 1934 1,950,370

UNITED STATES PATENT OFFICE

1,950,370

PACKAGING MACHINE

Garrett W. Mudd, Chicago, Ill., assignor, by mesne assignments, to Standard Sealing Equipment Corporation of New York

Application March 27, 1926, Serial No. 97,869

51 Claims. (Cl. 226—16)

This invention relates to improvements in packaging machines and one of the objects of this invention is to provide an improved machine of this character for placing filled containers into a box or carton for shipping or storage purposes.

A further object is to provide in an improved machine of this character operating automatically to stack or superpose a plurality of articles and then simultaneously place or deliver the entire stack into a box or carton.

A further object is to provide in an improved machine of this character means whereby division sheets or boards may be placed within the carton or box between predetermined stacks or tiers of the containers.

A further object is to provide an improved machine of this character which will be comparatively simple in construction, compact in arrangement and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which;

Figure 1 is a perspective view of a machine of this character constructed in accordance with the principles of this invention and taken from the front of the machine.

Figure 2 is a side elevation taken from the right hand side of Figure 1.

Figure 3 is a vertical sectional view taken on line 3—3 Figure 4.

Figure 4 is a sectional view taken on line 4—4 Figure 2.

Figure 5 is a sectional view taken on line 5—5 Figure 4.

Figure 6 is an enlarged detail sectional view of a portion of the mechanism for feeding the sheets or boards to be placed between the tiers or stacks of containers.

Figure 7 is a horizontal detail sectional view taken on line 7—7 Figure 4.

Figure 8 is a detail vertical sectional view taken on line 8—8 Figure 4.

Figure 9 is a sectional view taken on line 9—9 Figure 10.

Figure 10 is a front elevation of Figure 9.

Figure 11 is a detail perspective view of a portion of a tripping and setting mechanism for some of the parts.

Figure 12 is a sectional view taken on line 12—12 Figure 4.

Figure 13 is a detail sectional view taken on line 13—13 Figure 12.

Figure 14 is a front elevation of the parts shown in Figure 15.

Figure 15 is a sectional view taken on line 15—15 Figure 14.

Figure 16 is a left hand end elevation of Figure 17 showing a modified form of feeding mechanism for the packages.

Figure 17 is a side elevation of Figure 16.

Referring more particularly to the drawings the numerals 20 and 21 designate the side walls of a supporting structure, 22 the back and 23 the front wall, which latter is arranged adjacent the bottom of the structure and supported by the frame thus formed is an annular delivery frame or member 24, over which a carton 25 is sleeved, and into which carton superposed or stacks of containers are delivered at predetermined times in the cycle of operation of the machine. The carton 25 is removed by the placing of containers thereinto.

Supported by the side walls to extend across the frame is a shaft 26 rotatable in suitable bearings, and carried by the shaft 26 to rotate therewith are sprocket wheels 27, the wheels being located within the frame and adjacent the respective side walls 20 and 21.

Extending across the frame and journaled in suitable bearings in the side walls, adjacent the bottom of the frame, is another shaft 28 which supports sprocket wheels 29, one beneath each of the respective wheels 27 on the shaft 26.

Endless sprocket chains 30 pass over the respective pairs of sprockets 27—29 and carried by the sprocket chains at suitable intervals are a plurality of members 31.

Platforms 32 are secured by their extremities in any suitable manner to these members, preferably by deflecting the extremities of the platforms so that the platforms will extend across the space between the sprocket chains 30.

Guides 33 are preferably arranged adjacent the inlet of the delivery frame or member 24 and between which guides the members 31 pass when the respective platforms 32 are moving in a vertical plane adjacent the inlet of the delivery frame or member 24, so as to hold the platforms and the sprocket chains 30 against being deflected laterally when the cartons are delivered upon the platform and also when the superposed stacks are ejected therefrom.

Motion is intermittently imparted to the plat-

forms 32 in a manner to be hereinafter set forth, from any suitable source of power through the shaft 28, preferably by means of a pulley 34 driven by means of a belt (not shown).

The containers are supplied to the machine through an opening in the side wall 20, by means of a delivery chute or runway 35, on to a receiver 36 in the form of a platform, which in turn is connected at its ends to members 37 slidable in guides 38 (see particularly Figures 1 and 4) adjacent the outer faces of the walls 20—21.

The receiver extends across the frame and the ends thereof pass through suitable slots 39 in the side walls and are connected with the members 37.

The receiver is reciprocated by means of yoke like members 40 pivotally mounted adjacent their lower ends by means of a shaft 41.

Arms 42 are connected with the members 37 and also with the ends of the yokes 40, preferably through the medium of pins 43 engaging in slots 44 in the arms 42, to permit of a rocking motion being imparted to the yoke 40 and a sliding movement to the member 37.

The yokes are adapted to be rocked by means of eccentrics 45 which rotate in bearing blocks 46 slidable in the yokes 40.

When the eccentrics 45 are rotated a reciprocating movement will be imparted to the blocks or bearings 46 to cause them to slide in the yokes and this reciprocating movement will cause the yokes 40 to be rocked about their pivots 41 and thereby impart a forward and backwardly sliding movement to the receiver 36.

The receiver 36 is adapted to assume a position at the end of the chute or runway 35 and as the containers 47 (see particularly Figures 4 and 5) are delivered thereupon, the containers will pass beneath a stationary member or ledge 48.

When a predetermined number of the containers have been delivered to the receiver 36, the latter is moved forwardly to a position directly above and in close proximity to the path of movement of the platforms 32 carried by the sprocket chains 30.

As the receiver moves forwardly with the containers 47 thereon the containers will pass beneath a stripper 49 which is pivotally mounted or connected with the plate 48 as at 50 (see Figure 7). When the receiver 36 has reached the limit of its forward movement with the containers thereon, the forward edge of the stripper 49 will pass off of the containers and fall behind the rear end thereof.

As the receiver is then moved rearwardly and into a position to receive another supply of containers from the chute or runway 35, it will be stripped of the containers which have been advanced thereby, by reason of the fact that the stripper 49 will prevent the return of the containers with the receiver.

The containers stripped from the receiver 36 will be delivered to the adjacent platform 32 and at a predetermined time in the cycle of operation of the machine, the sprockets 27—29 will be given one step of rotation to lower the platform 32 to a position that the next supply of containers to be delivered from the receiver 36 will be superposed upon the previously delivered containers on the platform 32. This operation continues until the desired number of containers have been superposed upon the platform.

As a means of assisting in feeding the containers to the receiver 36, there may be provided feeding wheels or discs 51 which are adapted to engage and rest upon the tops of the containers, and these discs may be rotated in any suitable manner through the medium of a worm 52 engaging a worm gear 53 on the shaft of the disc 51.

The discs and the driving mechanism therefor are supported by means of a casing 54 having a shaft 55 therein driven by means of a shaft 56 to which the shaft 55 (see particularly Figures 4 and 7) is connected, through the medium of a universal coupling 47. The casing 54 is pivotally mounted as at 58 in direct alinement with the joint of the universal coupling 57, so that the casing 54 may rise and fall to a limited extent without interfering with the operation of the discs 51. The shaft 56 is rotated in a manner that will be hereinafter described.

After a predetermined number of containers 47 have been superposed upon the platform 32 (see particularly Figure 5) the platform 32 will have reached a position adjacent the bottom of the delivery frame or member 24, and during an interval of rest of the sprocket wheels 27—29 and the platforms 32, the superposed containers will be ejected from the platform 32 into the delivery frame or member 24. The platform 32 will again be intermittently advanced until another platform with the superposed containers thereon reaches a position adjacent the bottom of the delivery frame or member 24, and the containers thereon will be likewise ejected from their respective platform.

This operation will continue and the superposed containers will be intermittently advanced through the delivery frame or member 24 until the outermost tier or stack engages the bottom of the carton 25. A continued delivery of the superposed containers into the delivery frame 24 will cause the carton 25 to be stripped from the frame with the containers therein.

In order to accomplish this operation there is provided an ejector 58 which is adapted to be reciprocated by means of the yokes 40.

To that end there is provided a reciprocable member 59 the ends of which member project through slots 60 in the side members 20—21 of the frame and move between guide ways 61 on the outer faces of the members 20—21 (see particularly Figures 1 and 4).

Each end of the member 59 (see particularly Figures 2 and 3) is provided with a lug 62 projecting laterally therefrom, and pivotally connected with each of the yokes 40 as at 63 (see also Figure 1) is an arm 64. These arms carry members 65 having a bifurcated lower extremity 66 adapted to receive the respective lugs or projections 62, when the bifurcation is in a position to permit the lug to pass therein.

When the arms 64 are lowered so as to cause the bifurcation to engage over the lugs 62, the member 59 will be moved forwardly upon a corresponding movement of the yokes 40 and will be returned by the yokes.

The ejector 58, however, is not operated upon every step of operation of the receiver 36, but is only operated at predetermined intervals with respect to the operation of the receiver.

That is to say, in the present form of the invention, the platforms together with the sprocket wheels 27—29 and the sprocket chains 30 are adapted to be given four steps of advancing movement, so that four layers of containers will be superposed upon the platform 32, before the entire stack or tier is ejected from the platform into the delivery frame or member 24 by the ejector

58, as the ejector operates only after every fourth step of advancing movement of the platforms.

This is accomplished by reason of the fact that during the oscillating movement which is imparted to the yokes 40 to reciprocate the receiver 36, as well as the ejector 58, the latter will be disconnected from the yoke during three steps of the advancing movement of the platforms 32, but will be automatically connected with the yokes upon the fourth step of advancing movement of the platform and the ejector will then eject the superposed containers from one platform and the receiver 36 will at the same time position one layer of containers to be delivered to the next successive platform.

The yokes 40 are connected to the ejector by allowing the arms 64 to drop, so that the bifurcation in the members 65 will be in position to receive the lugs or projections 62 on the members 59, and the yokes will be disconnected from the member 59 by raising the arms 64.

This is accomplished in the following manner:

The members 65 are provided with anti-friction rollers 67 which are adapted to move on tracks 68 (see particularly Figures 1, 2, and 3). The tracks 68 are supported by pivotally mounted arms 69, one pair of arms on opposite sides of the frame being connected by a rock shaft 70, the other pair of arms being pivoted to the frame by pivots 70^a. Springs 71 are connected with the respective tracks 68, preferably to deflected ends 72 of the tracks and these springs tend normally to elevate the tracks so as to raise the arms 64 to cause their bifurcation to disengage the respective lugs or projections 62.

When the tracks are in an elevated position as shown in Figure 2, the yokes 40 may be operated to reciprocate the receiver 36, but the ejector 58 will remain inactive by reason of the fact that the yokes 40 are at that time disconnected therefrom.

When the tracks 68 are lowered against the stress of the springs 71, the arms 64 will drop so that the bifurcation 66 will engage over the lugs 62 on the members 59 and thereby connect the member 59 with the yokes 40 for reciprocation therewith.

Upon the completion of one complete cycle of operation of the ejector 58, it will be disconnected from the yokes 40 by reason of the fact that the arms 64 will be elevated, and the yokes 40 will then oscillate without imparting any motion to the ejector 58.

The tracks are elevated by the springs 71 and are lowered by means of an arm 73 (see particularly Figures 3 and 8) which is connected with the shaft 70 and extends rearwardly so that the extremity 74 of the arm will stand within the path of the upward movement of the members 31 on the sprocket chains 30, and the tracks will be held in their elevated position, or in the position shown in Figure 2, by the springs 71. The tracks will be lowered and held in their lowered position or in the position shown in Figure 3, by the member 31 engaging the extremity 74 of and rocking the arm 73, until the member 31 passes out of engagement with the arm 73. At this time the springs 71 will act upon the tracks 68 and cause them to be elevated to the position shown in Figure 2.

A stop 75 may be provided for limiting the movement of the arm 73 in the opposite direction.

The platforms 32 are given intermittent steps of advancement by intermittently rotating the shaft 26 and this is accomplished preferably in the following manner:

Carried by the shaft 26 and on the outside of the casing (see particularly Figures 3 and 4) is a disc like member 76 which is secured to the shaft for rotation therewith, and carried by the member 76 are a plurality of stops 77 which project beyond the periphery of the disc and are adjustable circumferentially thereof so that they may be secured to the disc at any desired interval with respect to each other, preferably through the medium of fastening screws or bolts 78.

A clutch member 79 is loosely mounted upon the shaft 26 and interposed between the adjacent faces of the clutch member and the disc 76 is a friction creating element 80.

A spring 81 is provided which encompasses a portion of the shaft 26, so that one end of the spring will rest against a ball bearing 82 that has contact with one face of the clutch member 79. The other end of the spring has contact with a member 83, which is adjustably mounted with respect to the shaft 26, through the medium of an adjusting device 84, so that the stress of the spring 81 may be varied.

The spring 81 tends normally to hold the clutch member 79 and the disc 76 frictionally locked under normal conditions, so that when the clutch member 79 is rotated through the medium of a sprocket wheel 85 carried thereby, the disc 76 and consequently the shaft 26 will be rotated. The intermittent steps of rotation are imparted to the shaft 26 by arresting, at predetermined intervals in the operation of the machine, the rotation of the disc 76 and shaft 26, while the clutch member 79 is rotating. This will cause the clutch member 79 to slide with respect to the disc 76.

For the purpose of arresting the rotation of the disc 76 there is provided a stop 86 (see particularly Figures 2, 3, and 11). This stop device is preferably in the form of a bell crank lever pivotally mounted as at 87. The extremity 88 of one arm of the lever is adapted to be moved into the path of movement of the stops 77, so that when one of the stops 77 contacts with the extremity 88 of the arm 86, the disc 76 will be held against rotation, but, when the extremity 88 of the arm 86 is moved out of the path of movement of the advancing stop 77, the disc 76 and consequently the shaft 26 will be frictionally locked with the clutch member 79 and the sprocket wheel 35, to be rotated thereby.

The lever 86 is swung about its pivot in one direction by means of a spring 89 and in the other direction by means of a link 90 which latter is connected by one end to the other arm of the bell crank lever, and is of a length to terminate in proximity to the shaft 28, at which point it is connected with another arm 91, intermediate the ends of the latter as at 92 and which arm 91 is pivotally mounted as at 93. A shoulder 94 is carried by the free end of the arm 91 and co-operates with a cam disc 95 loosely mounted upon the shaft 28, so that when the cam disc 95 is rotated and the high portion of the cam engages the projection 94 on the arm 91, the arm will be rocked about its pivot 93 and through the medium of the link 90, will rock the bell crank lever 86 against the stress of the spring 89 to move the end 88 of the lever out of the path of movement of the next advancing projection 77 on the disc 76.

The spring 89 will return the bell crank lever and the arm 91 as soon as the high portion of the cam has passed the projection 94.

The cam 95 is adapted to be locked with the shaft 28 for rotation therewith by means of a dog or pawl 96, which is carried by the disc and is controlled by a spring 97.

Secured to the shaft 28 for rotation therewith is a toothed or ratchet wheel 98 with which the pawl 96 co-operates. When the pawl is in the position shown in Figure 3, the cam 95 will be locked to the cam shaft 28 for rotation therewith so as to operate the bell crank lever 86 to release the shaft 26.

The cam 95 is connected with the eccentric 45 to rotate with the latter and when the pawl 96 locks the cam 95 with the shaft 28, the eccentric 45 will also be rotated and there will be imparted an oscillating movement to the yokes 40.

Upon the completion of one complete cycle of rotation of the cam 95, which rotation will have imparted a forward and backward movement to the yoke 40, the pawl 96 will be operated to release the cam 95, and thereby arrest the movement of the yoke 40, at which time the bell crank lever will be in a position to be engaged by the next advancing projection on the disc 76.

The mechanism which releases the pawl 96 is responsive in its operation to the feeding movement of the containers 47 on to the receiver 36 (see particularly Figures 4 and 11).

To that end there is provided a stop or abutment 99 which is arranged to be engaged by the foremost container 47 when they are in position upon the receiver 36.

As the containers roll down the chute 35 to the receiver, the front container will engage the abutment 99 and the stress of the containers thereagainst, which is augmented by the feeding movement imparted to the containers upon the receiver 36 by the feeding discs 51, the abutment 99 will be shifted and will, through the medium of an arm 100, which is connected thereto and which slides in a suitable bearing, rock a shaft 101 mounted in suitable bearings and which shaft is connected by means of a crank arm 102 with the arm 100 of the abutment 99.

Connected with the shaft 101 is another arm 103 which is provided with a cam shaped portion 104.

An arm or member 105 is pivotally supported at one end as at 106 and carries at its other end a pivoted latch 107 having a shoulder 108, and this latch is adapted to be engaged and moved about its pivot by the cam 104 carried by the arm 103.

The arm 105 is moved in one direction about its pivot preferably by means of a spring 109 (see Figure 3) which engages a fixed stop 110, and also an arm 111 which is connected with the member 105 by means of a pivot 112.

The arm 105 is positively moved in the opposite direction by means of a cam device 113 which engages a roller 114 carried by the arm 105, the cam 113 (see Figures 3 and 15) being rotated in a manner to be presently set forth.

A shoulder 108 on the arm 107 co-operates with a stop 115 on another arm 116 which latter is preferably pivotally mounted upon the pivot 106 to move the arm in one direction, and another shoulder 117 is provided on the arm 116 adapted to be positioned within the path of movement of one extremity of the pawl 96 to rock the latter and cause it to disengage the toothed or ratchet wheel 98, thus releasing the cam 95 with respect to the shaft 28 and also the eccentric 45, thereby causing the yokes 40 to remain idle at the same time that the pawl 96 is tripped by the shoulder 117, and the low portion of the cam 95 will have assumed a position with respect to the shoulder 94 on the arm 91, that the spring 89 will swing the bell crank lever 86 about its pivot to cause the extremity 88 thereof to move into the path of movement of the next advancing stop 77 on the disc 76.

This operation will take place at the time that the receiver 36 is being shifted and also at the time when the ejector 58 is being operated.

The arm 107 preferably passes through a guideway 118 on the arm 116, and a shoulder 119 may be provided on the arm 107 to limit the movement of the arm in one direction.

The arm 116 is moved in the opposite direction by means of a spring 120, so as to position the shoulder 117 in the path of movement of the pawl 96. The abutment 99 and the arm 103 with the cam 104 thereon is moved in the opposite direction by means of a spring 121.

It will therefore be seen that when the cam 104 (see particularly Figure 11) is moved so as to raise the arm 107, the shoulder 108 will be moved out of engagement with the shoulder 115 on the arm 116, and the latter will move forwardly under the stress of the spring 120, to position the shoulder 117 to be engaged by the pawl 96, and at that time the spring 109 (see also Figure 3) will, through the medium of the arm 11, swing the arm 105 about its pivot to cause the roller to be maintained in contact with the cam 113.

When the abutment 99 is shifted by the containers, the cam 104 will be moved out of engagement with the arm 107 and the latter will drop so that the shoulder 108 thereon will assume a position to engage the shoulder 115.

With the parts in this position, and when the cam 113 is rotated to swing the arm 105 against the stress of the spring 109, the arm 107 will, through the medium of the interengaging shoulders 108, 115 swing the arm 116 to move the shoulder 117 away from the pawl 96 to release the latter.

The cam 113, the clutch member 79 on the shaft 26 and sprocket 123 are rotated by means of an endless belt or sprocket chain 122 (see particularly Figures 2, 4 and 12) which passes over a sprocket wheel 85 connected with the clutch member 79, which latter is rotatable upon the shaft 26, and also over the sprocket wheel 123. The sprocket chain also passes over a sprocket wheel 124 which is connected with the cam 113 (see also Figures 14 and 15) to rotate the latter.

The sprocket chain also passes over a sprocket wheel 125 (see also Figure 4) which is mounted loosely upon the shaft 56. The sprocket wheel 125 is connected with a clutch member 126, and secured to the shaft 56 adjacent this clutch member is a ratchet wheel 127. Interposed between the clutch member 126 and the ratchet wheel 127, is a friction creating element 128, and the clutch member 126 is held in frictional contact with the element 128 and the ratchet wheel 127, for locking the clutch member 126 with the shaft 56 for rotation therewith, by means of a spring 129 bearing against a shoulder 130 and also against a bearing member 131a which latter operates upon the clutch member 126.

When the sprocket wheel 125 is frictionally connected with the shaft 56, the feeding discs 51 which operate upon the tops of the containers 47 will be rotated, and this motion will be imparted to these discs until a predetermined num-

ber of the containers is placed upon the receiver 36. At that time the sprocket wheel 125 will be disconnected with respect to the shaft 56, by rendering the clutch mechanism inactive. This will cause the feeding discs 51 to be rendered inactive and they will then serve as a means for arresting the supply of containers delivered from the chute or runway 35. At the time that the feeding discs 51 are rendered inactive they will be in a position to rest upon the top of one of the containers as shown in Figure 4.

The clutch thus formed is rendered inactive by arresting the movement of the ratchet wheel 127, and for that purpose there is provided a pawl 131, (see particularly Figures 2 and 7) which engages the teeth of the ratchet wheel and holds the latter against rotation, allowing the clutch member 126 to slip with respect to the ratchet wheel.

The pawl is adapted to be rocked about its pivot 132 by means of an arm 133 arranged within the path of movement of the upper end of the yoke 40. A spring 134 is provided which tends normally to move the pawl 131 into engagement with the ratchet wheel 127, and when in this position the pawl will hold the ratchet wheel 127 against rotation, but the sprocket wheel 125 and the clutch member 126 will be rotated with respect to the shaft 56, by the chains 122.

If it is desired to place separators such as sheets of cardboard or the like intermediate predetermined stacks or piles of the containers as they are being placed into the carton or boxes, means may be provided for feeding and placing such sheets therebetween at the proper time in the cycle of operation of the machine.

To that end a holder 135 (see particularly Figures 1, 2, 5, 6 and 7,) is provided for holding division sheets 136 on end, and the holder is preferably inclined so as to facilitate in the feeding of the sheets to the delivery mechanism.

At the delivery end of the holder is a reciprocable bar or member 137 having pins or impalement devices 138 connected therewith for impaling the sheets and removing them separately from the supply.

This member 137 preferably reciprocates upon guides 139, through the medium of links 140 one end of each of which is connected with the member 137 and the other ends are pivotally connected as at 141 to discs 142. The discs are connected to operate in unison by means of a shaft 144, and one of the discs is preferably in the form of a sprocket wheel over which a sprocket chain 143 passes.

The sprocket chain 143 also passes over another sprocket wheel 145 which carries a pawl 146. This pawl co-operates with a ratchet wheel 147 which is rotatable with respect to the sprocket 145, and rotatable with the ratchet wheel 147 is a gear wheel 148, with which a rack 149 engages (see particularly Figures 10, and 2 and 3) and the rack is connected with the member 59 and the ejector 58 for movement therewith, so that upon predetermined forward movement of the ejector 58 to eject a supply of containers from the platform 32, the member 137 carrying the pins 138 will be reciprocated by reason of the fact that the rack 149 will rotate the gear 148 which meshes therewith and the gear in turn rotates the sprocket wheel 145 and through the medium of the sprocket chain 143 the sprocket gear 142 will be rotated to rotate the discs 142 which latter are connected with the member 137 by means of the links 140. Upon each lowering movement of the member 137 one sheet or division member 136 will be removed from the holder 135. When the ejector 58 is moved in the opposite direction the member 137 will be raised by means of the rack 149 and gear 148, moving in the opposite direction, so that upon the next lowering operation, another sheet will be delivered.

As these sheets or division members are removed from the holder 135, the upper edges thereof will be passed, by the member 137, between co-operating feeding rollers 147', 148' and will be guided thereby into guideways, 149, so that when the partition members or sheets are released, they will drop in a vertical position from between the guideways 149 through guideways 150 and across the entrance end of the delivery frame or member 24 and in advance of one of the tiers or stacks of containers 47 which are to be delivered upon the next movement of the ejector 58, from the adjacent platform 32.

Obviously the rate of speed or the intervals at which these division members or sheets may be supplied may be varied by interchanging the gear 148 with another gear, as will be understood.

Motion is imparted to the feed and guide rollers 147'—148' preferably by means of a sprocket chain 151, (see particularly Figure 2) which passes over a sprocket wheel 152 on the shaft 153, and which shaft carries the feed rolls 147'. The sprocket chain also passes over a sprocket wheel 154 (see also Figures 14 and 15) which is connected with the cam device 113 for rotation therewith.

Another sprocket wheel 155 is connected with the shaft 156 which carries the feed rolls 148' and this sprocket wheel may be held in engagement with one of the runs of the endless chain 151, by means of a suitable spring controlled bearing member 157.

The guideways 149—150 are supported in suitable positions by means of supporting members 158.

In order to adapt this machine for feeding packages other than round containers 47, a shaft 159 (see particularly Figures 16 and 17) is employed in lieu of the shaft 56 and on this shaft is arranged the friction drive and ratchet mechanism similar to that shown in Figure 4 on the shaft 56.

This shaft 159 extends across the machine and has connected with it a worm 160 which meshes with a worm gear 161 that is carried by a shaft 162. This shaft is journaled in suitable bearings 163 that are mounted for adjustment toward and away from each other as at 164. Journaled in the bearings 163 are shafts which respectively carry feed rollers 165. Arranged opposite and spaced from each other and connected with the rollers 165 are worms 166 which mesh with worm gears 167 carried by the shaft 162. The bearings 163 together with the respective worm gears 167 are adjustable longitudinally of the shaft 162 toward and away from each other and during this adjustment the feed rollers 165 are also moved toward and away from each other to compensate varying sizes of the packages 168. The packages are fed upon the receiver 36 preferably by means of a conveyer 169 and are passed between the rollers 165. These rollers engage the side walls of the packages and feed them on to the receiver 36 until the foremost package engages the abutment 99.

The adjustment of the feed rollers 165 and the respective worm gearing 166—167 is effected by

adjusting the bearings 163 with respect to each other.

Thus it will be seen that the feed rollers 165 may be adjusted with respect to each other and during such adjustment the worm gears 167 will be adjusted longitudinally of the shaft 162, the worm gears being secured to the shaft 162 for rotation therewith and for adjustment longitudinally with respect thereto.

It is thought that the operation of this machine will be clearly understood from the foregoing description but briefly stated it is as follows:

Power is applied to the pulley 34 which is continuously operated and the shafts 26, 28 and 55 are connected with the pulley through the medium of the respective clutch devices. This will cause the sprocket chains 30 carrying the platforms 32 to be advanced, and intermittent advancing movements of the platforms 32 are produced by swinging the bell crank lever 86 so that its end will be moved into the path of the advancing movement of one of the projections 77 on the member 76. This will arrest the advancement of the projections 77 on the member 76, and the advancement of the platforms will be arrested.

When the bell crank lever 86 is swung out of the path of movement of the stops 77, another step of advancing movement will be imparted to the platforms.

The rocking of the lever 86 is effected through the medium of the feeding operation of the containers 47 from the chute 35 on to the receiver 36, and augmented by the feeding rollers 51 (see Figure 4).

The containers 47 will move the abutment 99 (see also Figure 11) to rock the shaft 101, and thereby swing the cam 104 to a position that the arm 107 will drop to position the shoulder 108 thereon so that it will engage the shoulder 115 on the arm 116.

As the cam 113 (see also Figure 3) rotates, it will, through the medium of the roller 114, rock the arm 105, and this rocking movement, will, through the medium of the arm 107 and shoulders 108, 115, rock the arm 116 to move the shoulder 117 out of contact with the pawl. When the pawl is thus released the spring 97 will cause the pawl to engage the toothed or ratchet wheel 98, thereby locking the cam 95 for rotation with the shaft 38.

As the cam 95 rotates it will raise the arm 91 and this raising movement of the arm, will, through the medium of the link 90, rock the bell crank lever 86 against the stress of the spring 89 to permit the platforms to be advanced, the cam 95 making practically one complete revolution before shifting the arm 91.

As the low portion of the cam 95 approaches the arm 91, the spring 89 will cause the arm to follow the cam and this will move the end of the bell crank lever 86 into the path of the advance movement of one of the projections 77 on the disc 76 to arrest the advancing movement of the platforms.

Upon the completion of the third step of advance movement of the platforms, or any predetermined number of steps, according to the relative arrangement of the stops 77 on the disc 76, the ejector 58 will be operated to eject the superposed containers which are on the platform 32 adjacent the inlet of the delivery frame or member 24, during the time that another layer of containers are being moved by the receiver 36 into a position above the next adjacent platform 32, to be stripped from the receiver, and to this last mentioned platform, at the same time that the ejector 58 is being retracted.

The operation of rendering active and inactive the ejector 58, is controlled by the tracks 68 which are raised by means of the springs 71 to render the ejector inactive, and are lowered by means of the arm 73 being shifted by the members 31 on the sprocket chains 30, to render the ejector active.

This shifting of the arm 73 will lower the tracks 68 to permit the arms 64 to rock about their pivots 63, so that the bifurcation in the members 65 will pass over the respective projections 62 on the member 59 to which the ejector is connected, and thereby connect the ejector with the yokes 40, so that upon the next operation of the yokes the ejectors will be operated.

As the ejector 58 is actuated, the feeding mechanism for delivering sheets or partition members between respective stacks or tiers of the containers will also be actuated.

Obviously the feeding mechanism for the sheets 136 may be disconnected from the machine when it is not desired to insert these partition or division sheets.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims without departing from the spirit of this invention.

What is claimed as new is:—

1. A packaging machine including a receiver, means for delivering a supply of articles to the receiver, a support having an intermittent orbital movement, means for intermittently advancing the support, and means for intermittently shifting the said receiver to superpose the said articles upon the said support.

2. A packaging machine including a receiver, a support having an orbital movement and movable adjacent the receiver, means for intermittently advancing the said support, means for supplying articles to the receiver, and means for intermittently moving the receiver to a position over the said support and for retracting the receiver for superposing the said articles upon said support.

3. A packaging machine including a receiver, a support having an intermittent orbital movement and movable adjacent the receiver, means for intermittently advancing the said support, means for supplying articles to the receiver, means for intermittently moving the receiver to a position over the said support and for retracting the receiver for superposing the said articles upon said support, and means for removing the said articles from the receiver to the said support as the receiver is retracted.

4. A packaging machine including a receiver, means for delivering articles to the said receiver, a support having an intermittent orbital movement and movable adjacent the receiver, means for moving the receiver to a position over the support and for retracting the receiver, a stripper adapted to assume a position behind the articles on the receiver to strip them therefrom as the receiver is retracted, and means for intermittently advancing the said support.

5. A packaging machine including a receiver, means for delivering a supply of articles to the receiver, a support, means for intermittently shifting the receiver to superpose the articles

upon said support, means for intermittently advancing the said support, and means controlled by the supply of articles upon the said receiver for controlling the said advancing means.

6. A packaging machine including a receiver, means for supplying articles to the receiver, a support, means for intermittently shifting the receiver to superpose the articles upon said support, means for intermittently advancing the said support, and means controlled by the articles upon the said receiver for controlling the shifting of the receiver.

7. A packaging machine including a receiver, means for delivering a supply of articles to the receiver, a support having an intermittent orbital movement, means for intermittently shifting the receiver to a position above the support to superpose the articles upon the support, means for intermittently advancing the said support, and means arranged adjacent the path of movement of the support and automatically rendered active at a predetermined time in the advancing movement of the said support for ejecting the articles from the said support.

8. A packaging machine including a receiver, means for delivering a supply of articles to the receiver, a support having an intermittent orbital movement, means for intermittently shifting the receiver to a position above the support to superpose the articles upon the support, means for intermittently advancing the said support, an ejector arranged adjacent the path of movement of the support for engaging and removing the superposed articles from the support, and means operating automatically at a predetermined time in the advancing movement of the said support for connecting the said ejector with and disconnecting it from the actuating means for the said receiver.

9. A packaging machine including a support, means for imparting intermittent steps of orbital movement thereto, a receiver adjacent the path of movement of the support, means for delivering articles to the receiver, means for shifting the receiver over the support and for retracting the receiver to superpose the articles upon the said support, means for holding a carton adjacent the path of movement of said support, and means for engaging the articles on the support and for ejecting the superposed articles from the support into the said carton.

10. A packaging machine including a support having an intermittent orbital movement, means for imparting intermittent steps of advancement thereto, a receiver adjacent the path of movement of the support, means for delivering articles to the receiver, means for shifting the receiver over the support and for retracting the receiver to superpose the articles upon the said support, means for holding a carton adjacent the path of movement of said support, an ejector adjacent the path of movement of the support for engaging and removing the superposed articles from said support and delivering them into a carton, and means automatically rendered active at a predetermined time in the cycle of advancement of said support for rendering the said ejector active.

11. A packaging machine including a support having an intermittent orbital movement, means for imparting intermittent steps of advancement thereto, a receiver adjacent the path of movement of the support, means for delivering articles to the receiver, means for shifting the receiver to superpose the articles upon the said support, a holder for holding a carton adjacent the path of movement of the said support, and means arranged adjacent the path of movement of the support and automatically rendered active for engaging and ejecting the tier of superposed articles from the said support and into the carton, the last recited means also operating to remove the said carton from the said holder as the articles are delivered into the carton.

12. A packaging machine including a support having an intermittent orbital movement, means for imparting intermittent steps of advancement thereto, a receiver adjacent the path of movement of the support, means for delivering articles to the receiver, means for shifting the receiver to superpose the articles upon the said support, a holder for holding a carton adjacent the path of movement of the said support, means arranged adjacent the path of movement of the support and automatically rendered active for ejecting the tier of superposed articles from the said support and into the carton, the last recited means also operating to remove the said carton from the said holder as the articles are delivered into the carton, and means for inserting separating sheets between adjacent tiers of the said articles.

13. A packaging machine including a support, means for imparting intermittent steps of advancement thereto, a receiver adjacent the path of movement of the support, means for delivering articles to the receiver, means for shifting the receiver to superpose the articles upon the said support, a holder for holding a carton adjacent the path of movement of the said support, means automatically rendered active for ejecting the tier of superposed articles from the said support and into the carton, the last recited means also operating to remove the said carton from the said holder as the articles are delivered into the carton, and means responsive in its operation to the operation of the said ejecting means for delivering a separating element between adjacent tiers of the articles and as they are being delivered into the said carton.

14. A packaging machine including an intermittently advancing support having an orbital movement, a receiver, means for delivering articles to the receiver, means for successively delivering layers of articles from the receiver and superposing them upon the said support at predetermined intervals in the advancement of the support, means for holding a carton adjacent the path of movement of the said support, and means arranged adjacent the path of movement of the support for simultaneously ejecting the superposed articles from the said support and into the said container.

15. A packaging machine including an intermittently advancing support having an orbital movement, a receiver, means for delivering articles to the receiver, means for successively delivering layers of articles from the receiver and superposing them upon the said support at predetermined intervals in the advancement of the support, means for holding a carton adjacent the path of movement of the said support, means arranged adjacent the path of movement of the support for simultaneously ejecting the superposed articles from the said support and into the said container, and means for inserting separating elements between predetermined tiers or stacks of the superposed articles in a direction transverse to the direction of delivery of the articles and as the articles are being delivered into the said carton.

16. A packaging machine including an inter-

mittently advancing support having an orbital movement, a receiver, means for delivering articles to the receiver, means for successively delivering layers of articles from the receiver and superposing them upon the said support at predetermined intervals in the advancement of the support, means for holding a carton adjacent the path of movement of the said support, means arranged adjacent the path of movement of the support for simultaneously ejecting the superposed articles from the said support and into the said container, and means responsive in its operation to the advancement of the said support for rendering the said ejecting means active.

17. A packaging machine including an intermittently advancing support, a receiver, means for delivering articles to the receiver, means for successively delivering layers of articles from the receiver and superposing them upon the said support at predetermined intervals in the advancement of the support, means for holding a carton adjacent the path of movement of the said support, means for simultaneously ejecting the superposed articles from the said support and into the said container, and means controlled by the delivery of the articles to the said receiver for controlling the advancement of the said support.

18. A packaging machine including a support having an intermittent orbital movement, a receiver for receiving and delivering the articles to the support, means for moving the receiver over and also away from the support, and a stripper shifted by the articles passing therebeneath as they are positioned to be delivered to the support, said stripper passing off of the articles to a position behind the articles to engage and remove them from said receiver when the latter is retracted.

19. A packaging machine including an intermittently movable support having an orbital movement, a receiver for receiving and delivering the articles to the support, means for moving the receiver over and also away from the support, a stripper beneath which the articles are passed to be delivered to the support, said stripper operating to assume a position behind the articles to remove them from said receiver when the latter is retracted, an abutment to be engaged and shifted by one of the articles when a predetermined number of articles are held by the receiver, and means responsive to the movement of the abutment for controlling the advancement of the said support.

20. A packaging machine including an intermittently movable support, a receiver for receiving and delivering the articles to the support, actuating means for the receiver, an abutment to be engaged and shifted by the articles when a predetermined number of articles are held by the receiver, means responsive to the movement of the abutment for controlling the movement of the said support, means for feeding the articles to the receiver, and means responsive in its operation to the actuation of the said receiver for controlling the said feeding means.

21. A packaging machine including an intermittently movable support, a receiver for receiving and delivering the articles to the support, actuating means for the receiver, an abutment to be engaged and shifted by the articles when a predetermined number of articles are held by the receiver, means responsive to the movement of the abutment for controlling the movement of the said support, means for feeding the articles to the receiver, and means responsive in its operation to the actuation of the said receiver for controlling the said feeding means, the said feeding means embodying a rotatable disc like element adapted to engage and rest upon the articles as they are advanced thereby, the said element operating to retard the feeding of the articles after a predetermined number of articles are held by the said receiver.

22. A packaging machine including an intermittently advancing carrier having an orbital movement, a receiver adjacent the carrier for successively receiving a plurality of series of articles and superposing them upon the carrier, an ejector for simultaneously ejecting the superposed articles from the carrier, a reciprocable actuator operatively connected with the said receiver, and means arranged adjacent the path of travel of the carrier and operating automatically to connect and disconnect the said ejector with the said actuator at predetermined times in the cycle of operation of the said ejector.

23. A packaging machine including an intermittently advancing carrier, a receiver adjacent the carrier for successively receiving a plurality of series of articles and superposing them upon the carrier, an ejector for simultaneously ejecting the superposed articles from the carrier, a reciprocable actuator operatively connected with the said receiver, and means controlled by the advancement of the said carrier for automatically connecting and disconnecting the said ejector with the said actuator.

24. A packaging machine including an intermittently advancing carrier, a receiver adjacent the path of movement of the carrier for successively receiving a plurality of series of articles and superposing them upon the carrier, an ejector for simultaneously ejecting the superposed articles from the carrier, a reciprocable actuator operatively connected with said receiver, means operating automatically to connect and disconnect the said ejector and the said actuator at predetermined times in the cycle of operation of said actuator, and means controlled by the articles upon the carrier for controlling the operation of the said actuator.

25. A packaging machine including an intermittently advancing carrier, a receiver for receiving a plurality of series of articles and superposing them upon the carrier, an ejector for simultaneously ejecting the superposed articles from the carrier, a reciprocable actuator operatively connected with said receiver for actuating the latter, means operating automatically to connect and disconnect the said ejector and the said actuator at predetermined times in the cycle of operation of said actuator, and means responsive in its operation to the actuation of the said actuator for controlling the advancement of the said carrier.

26. A packaging machine including an intermittently advancing carrier, a receiver for receiving a plurality of series of articles and superposing them upon the carrier, an ejector for simultaneously ejecting the superposed articles from the carrier, a reciprocable actuator operatively connected with said receiver for actuating the latter, means operating automatically to connect and disconnect the said ejector and the said actuator at predetermined times in the cycle of operation of said actuator, and means responsive in its operation to the actuation of the said actuator for controlling the advancement of the said carrier, the last recited means embodying frictionally co-operating clutch mem-

bers and means for restraining one of the clutch members against movement while the other clutch member is in operation.

27. A packaging machine including a reciprocable receiver, an intermittently movable carrier, a reciprocable ejector, a reciprocable actuator, means operatively connecting the said receiver with the said actuator, means operating automatically to connect and disconnect the said ejector with and from the said actuator, the last recited means including two parts movable into and out of engagement, a shiftable track for controlling such movement of the said parts, a shoulder connected with one of the said parts and movable upon the track, and means for raising and lowering the track.

28. A packaging machine including a reciprocable receiver, an intermittently movable carrier, a reciprocable ejector, a reciprocable actuator, means operatively connecting the said receiver with the said actuator, means operating automatically to connect and disconnect the said ejector with and from the said actuator, the last recited means including two parts movable into and out of engagement, a shiftable track for controlling such movement of the said parts, a shoulder connected with one of the said parts and movable upon the track, and means controlled in its operation by the advancing movement of the said carrier for causing the said track to be raised and lowered.

29. A packaging machine including a tubular delivery frame upon which a carton is adapted to be sleeved, means for advancing a plurality of superposed articles adjacent the inlet of said frame, an ejector for delivering the superposed articles through the said frame and into the carton and for stripping the carton from the said frame, and means for interposing a separating sheet in the path of movement of the said articles by the ejector to be delivered therewith by the ejector into the said carton.

30. A packaging machine including a tubular delivery frame upon which a carton is adapted to be sleeved, means for advancing a plurality of superposed articles adjacent the inlet of said frame, an ejector for delivering the superposed articles through the said frame and into the carton and for stripping the carton from the said frame, and means responsive in its operation to the actuation of the said ejector for interposing a separating sheet in the path of movement of the said articles by the ejector to be delivered therewith by the ejector into the said carton.

31. A packaging machine including an intermittently advancing carrier, means for advancing the carrier, the said means including frictionally engaging rotatable clutch members, spaced stops carried by one of the members, a shiftable stop movable into the path of advancing movement of the first recited stops to arrest the movement of one of the clutch members while the other clutch member is moved with respect thereto, means for supplying articles to the said carrier, and means responsive in its operation to the supply of articles for controlling the operation of the said shiftable stop.

32. A packaging machine including an intermittently advancing carrier, means for advancing the carrier and including frictionally engaging clutch members, spaced stops on one of the members, a shiftable stop movable into the path of movement of the first recited stops to arrest the movement of one of the clutch members, a constantly operating driving element, a cam device, means operating automatically at a predetermined time in the cycle of operation of the machine to connect the said cam device with the said driving element, and means connected with the said shiftable stop and operable by the said cam device for shifting the said shiftable stop.

33. A packaging machine including an intermittently advancing carrier, means for advancing the carrier and including cooperating clutch members, spaced stops on one of the clutch members, a shiftable stop movable into the path of movement of the first recited stops to arrest the movement of one of the clutch members, a constantly operating driving element, a cam device, means controlled by the supply of articles to be packed for automatically connecting said cam device with the said driving element, and means responsive in its operation to the operation of the said cam device for shifting the said shiftable stop.

34. A packaging machine including a rotatable member, spaced stops carried thereby, a shiftable stop movable into the path of the first said stops to arrest the movement of said member, a constantly rotatable element, a cam device, means operatively connected with the shiftable stop and operable by the cam device for shifting the former, and means responsive in its operation to the feeding of the articles to be packed, for locking and unlocking the cam device with respect to said element, the last said means including opposed pivotally mounted and spaced lever like members, a latch carried by one of the levers, a stop carried by the other lever, a portion of the latch being adapted to be positioned to engage said stop to rock the other lever when the latch carrying lever is rocked, means for rocking the latter, and means controlled by the supply of the articles to be packed for rendering the said latch inactive.

35. A packaging machine including a rotatable member, spaced stops carried thereby, a shiftable stop movable into the path of the first said stops to arrest the movement of said member, a constantly rotatable element, a cam device, means operatively connected with the shiftable stop and operable by the cam device for shifting the former, and means responsive in its operation to the feeding of the articles to be packed, for locking and unlocking the cam device with respect to said element, the last said means including opposed pivotally mounted and spaced lever like members, a latch carried by one of the levers, a stop carried by the other lever, a portion of the latch being adapted to be positioned to engage said stop to rock the other lever when the latch carrying lever is rocked, means for rocking the latter, and means embodying a cam formation shiftable by the supply of articles and operating to position the said latch to permit the latch carrying lever to be operated independently of the other of said levers.

36. A machine of the character described including a constantly driven element, a second element, a locking member, means tending normally to render said member active, a pair of pivotally mounted levers, means for rocking one of the levers, an actuating element carried by the last said lever and operating to move the other lever when the former is rocked, means on the said other lever for rendering the said locking member inactive, and means operating automatically to render the said actuating element inactive to permit one of the levers to be

operated independently of the other of the levers.

37. A machine of the character described including a constantly driven element, a second element, a locking member, means tending normally to render said member active, a pair of pivotally mounted levers, means for rocking one of the levers, an actuating element carried by the last said lever and operating to move the other lever when the former is rocked, means on the said other lever for rendering the said locking member inactive, and means including an automatically operating cam device for shifting the said actuating element with relation to its supporting lever to render the same inactive to permit one of the levers to be operated independently of the other of the levers.

38. A machine of the character described including a receiver, means for feeding articles to the receiver, the said means embodying a rotatable feeding element, a swinging support for said element, means for rotating said element, and means for automatically controlling the rotation of said element, the said element also operating to retard the supply of articles.

39. A machine of the character described including a receiver, means for feeding articles to the receiver, the said means embodying a rotatable feeding element, a swinging support for said element, means for rotating said element, and means automatically controlled by the supply of articles for controlling the operation of said feeding element.

40. A machine of the character described including a receiver, means for feeding the articles to the receiver, the said means including spaced rollers adapted to successively engage and advance the articles, a gear connected with each of the rollers for rotating them, a shaft, gears adjustably mounted on the shaft and individual to the first said gears, a drive shaft, an additional gear on the first said shaft, a gear on the drive shaft and meshing with the last said gear, means for actuating the first said shaft, and means mounting said rollers for adjustment toward and away from each other.

41. A packaging machine embodying a carrier for receiving and holding a plurality of supplies of articles, each of said supplies embodying a plurality of articles, means for intermittently advancing the carrier, means controlled by the respective supplies of articles being delivered to the carrier for controlling the actuation of the carrier, and means for simultaneously ejecting all of the articles of the respective supplies from the carrier.

42. A packaging machine embodying a carrier for receiving and holding a plurality of supplies of articles, means for intermittently advancing the carrier, means controlled by the supply of articles being delivered to the carrier for controlling the actuation of the carrier, and means for ejecting the articles from the carrier, the said carrier having a constant orbit of movement and operating about the ejecting means.

43. A packaging machine embodying an endless conveyer, article supports connected with the conveyer, means for intermittently advancing the supports, means for superposing the articles upon the supports, and an ejector arranged adjacent the path of movement of the supports for ejecting the articles from the supports, said conveyer and supports operating about the ejector.

44. A packaging machine embodying an endless conveyer, article supports connected with the conveyer, means for intermittently advancing the supports, means for superposing the articles upon the supports, an ejector arranged adjacent the path of movement of the supports for ejecting the articles from the supports, said conveyer and supports operating about the ejector, and means for automatically rendering the ejector active and inactive at predetermined times in the cycle of operation of the machine.

45. In a packing machine of the kind described, an article projector, an operator for the projector movable back and forth continuously, and means for connecting the operator to the projector on selected forward movements.

46. In an article packing machine, a conveyer for receiving articles layer by layer and arranging the layers in a compact relation for projection into a box, a member movable continuously back and forth transversely of the conveyer, a pusher arranged transversely of the conveyer, and means for automatically connecting the member to the pusher for movement therewith upon selected movements of said member.

47. In a packing machine of the kind described, a packing plunger adapted to push articles into a box, an accumulator movable step by step for arranging articles in a stack composed of a plurality of layers for projection into a box, a plunger operator movable back and forth once for each movement of the accumulator, and means for connecting the plunger to the operator for movement therewith upon the accumulation of a sufficient number of layers.

48. In a packing machine of the kind described, a packing plunger adapted to be moved forward at selected times, a plunger operator movable back and forth continuously, a hook for connecting the plunger to the operator for movement therewith, means normally holding the hook in non-connecting position, and means operable in time with the movements of the operator for releasing the hook from the holding means at selected intervals.

49. In a box packing machine, means for holding a box to be packed, a conveyer chain movable step by step past the box and adapted to receive articles to be packed in the form of successive layers on successive flights of the chain, and the chain adapted to arrange the layers in compact parallel relation for projection into the box.

50. An article packing machine embodying a carrier for receiving and holding a supply of articles, means for intermittently advancing the carrier, means for feeding the articles to the carrier, means for intermittingly ejecting the articles from the carrier, and means responsive in its operation to the operation of said ejecting means for arresting the feed of the articles to the carrier.

51. An article packing machine embodying a conveyer for delivering articles to the machine, an endless carrier having members spaced throughout the length of the carrier for successively receiving separate supplies of the articles and for supporting and carrying the supplies to a common discharging station, means for intermittingly operating said carrier, ejecting means, and means for intermittingly operating said ejecting means after a predetermined number of steps of movement of said carrier for simultaneously ejecting the supplies of articles held by a plurality of the said members of the carrier.

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