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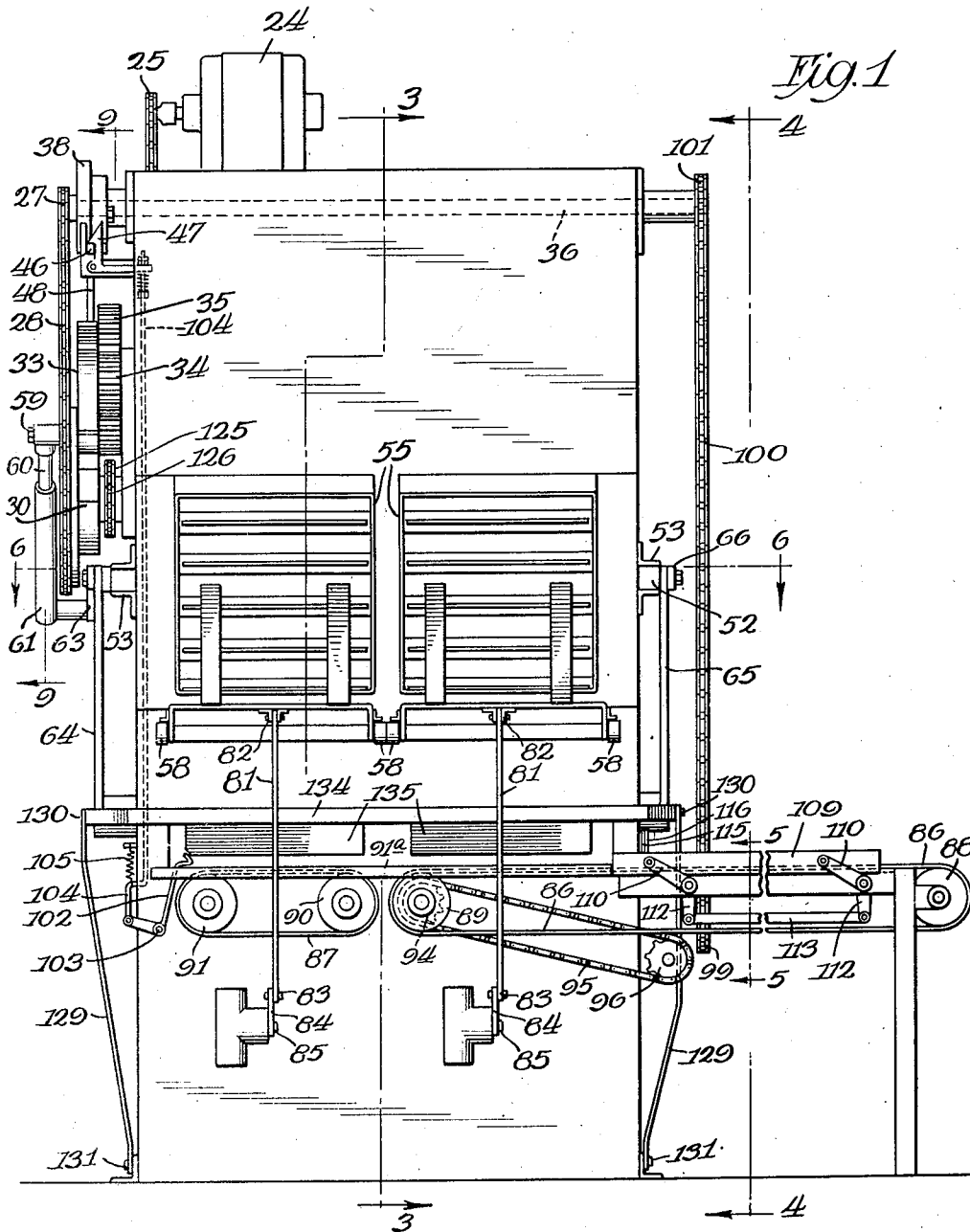
G. W. MUDD

1,935,409

PACKAGING MACHINE

Original Filed Aug. 20, 1928

7 Sheets-Sheet 1



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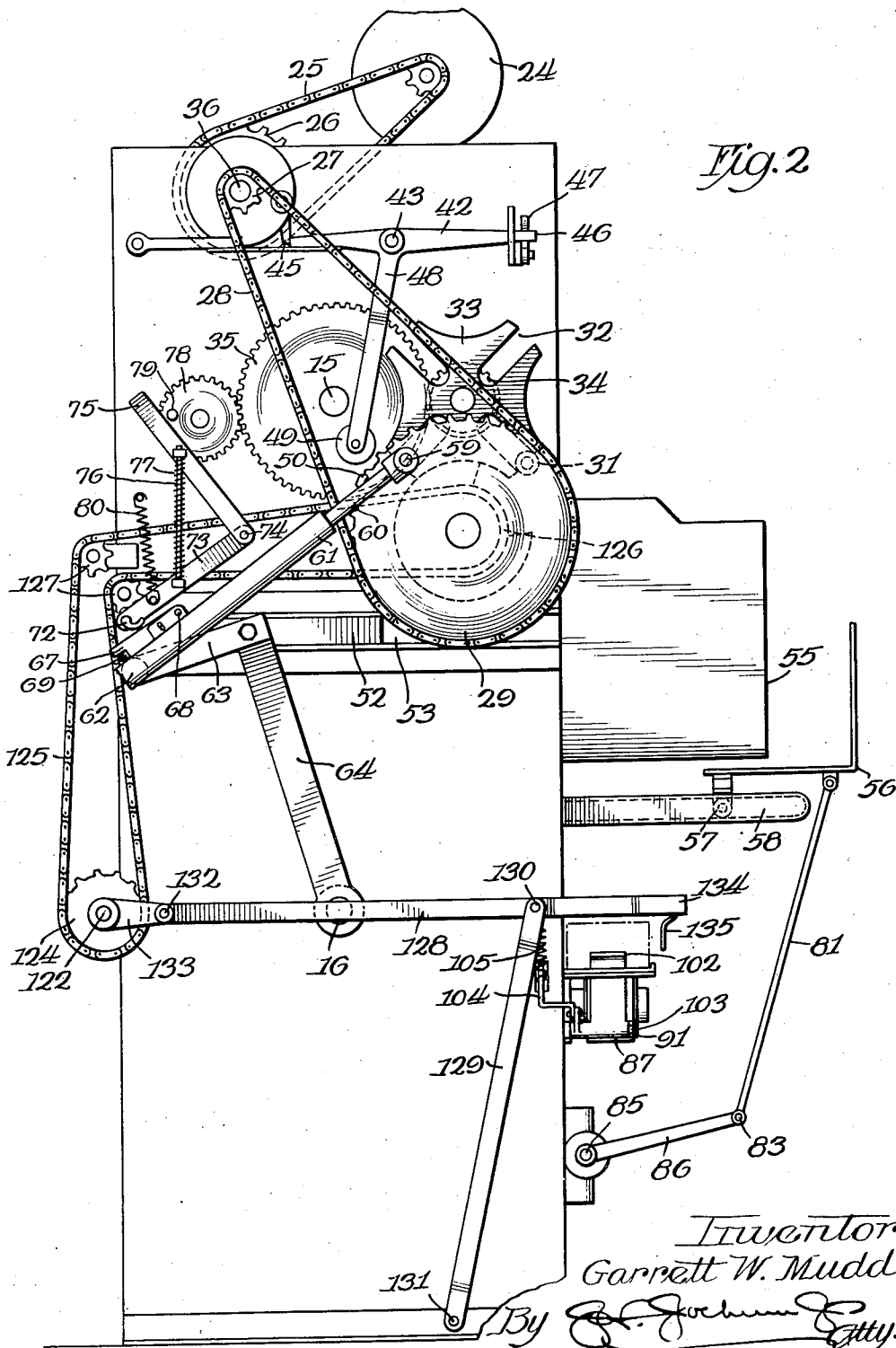
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PACKAGING MACHINE

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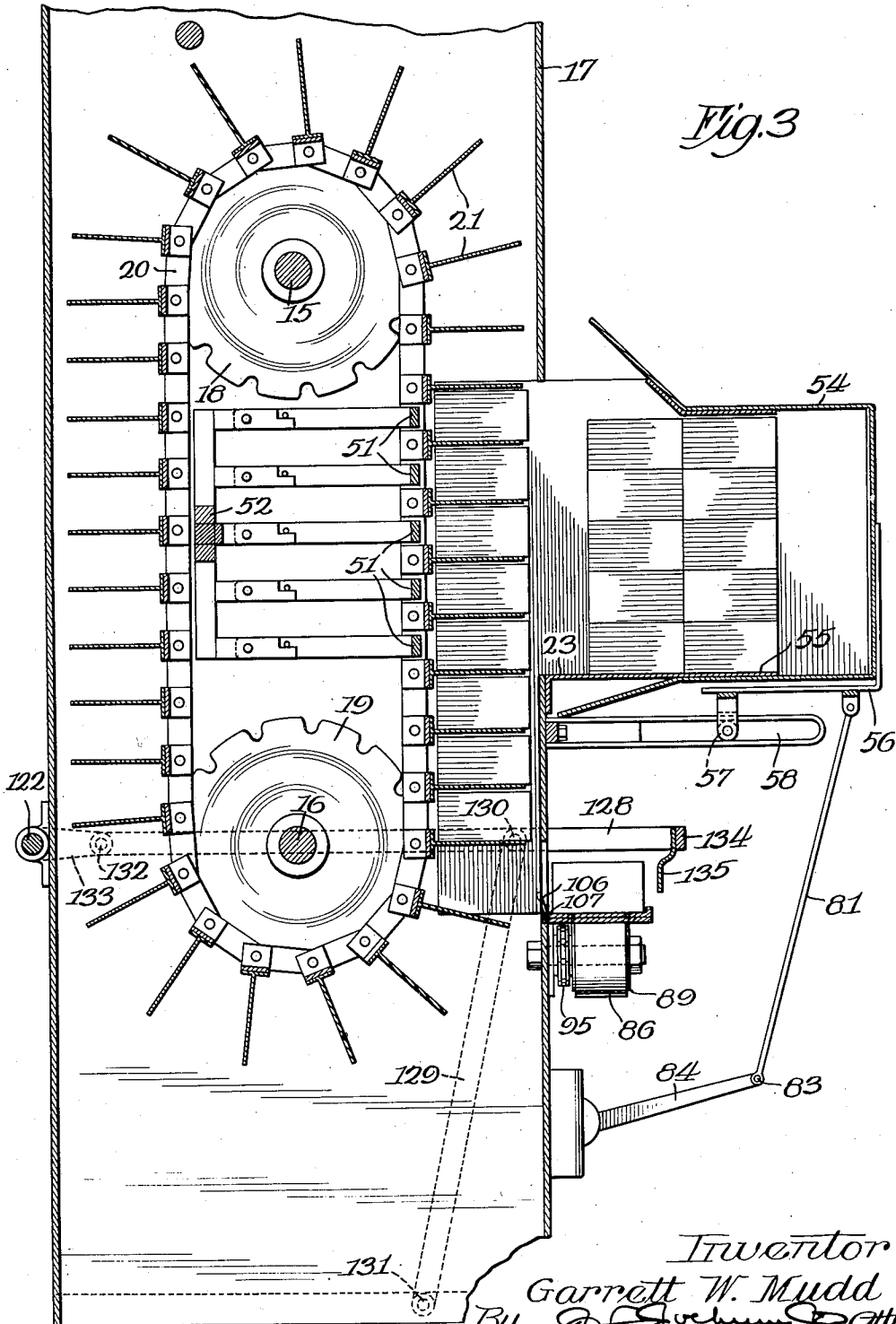
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PACKAGING MACHINE

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7 Sheets-Sheet 3



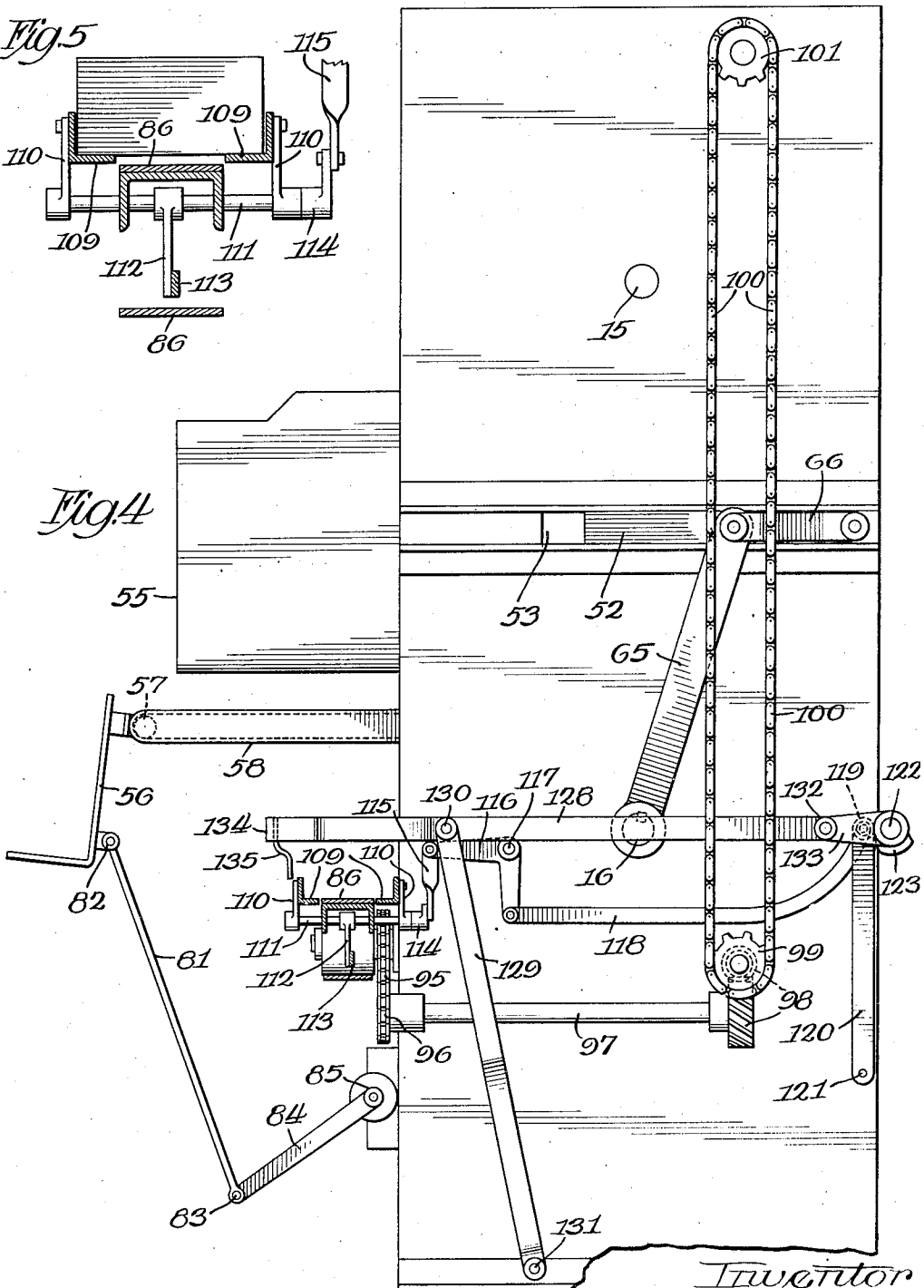
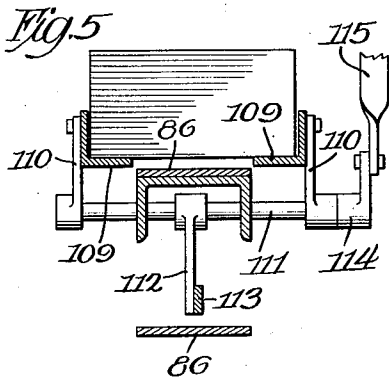
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PACKAGING MACHINE

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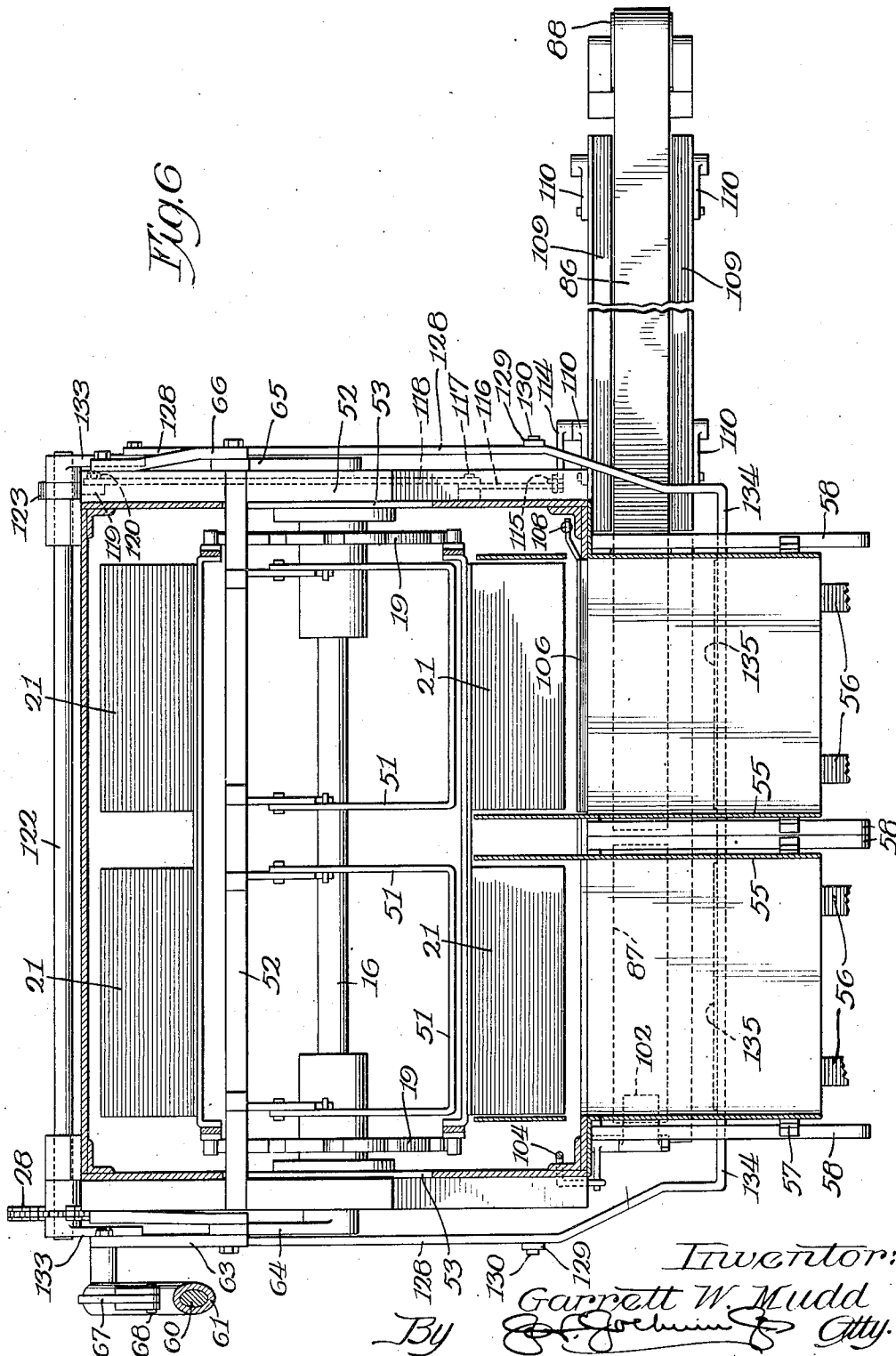
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G. W. MUDD

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PACKAGING MACHINE

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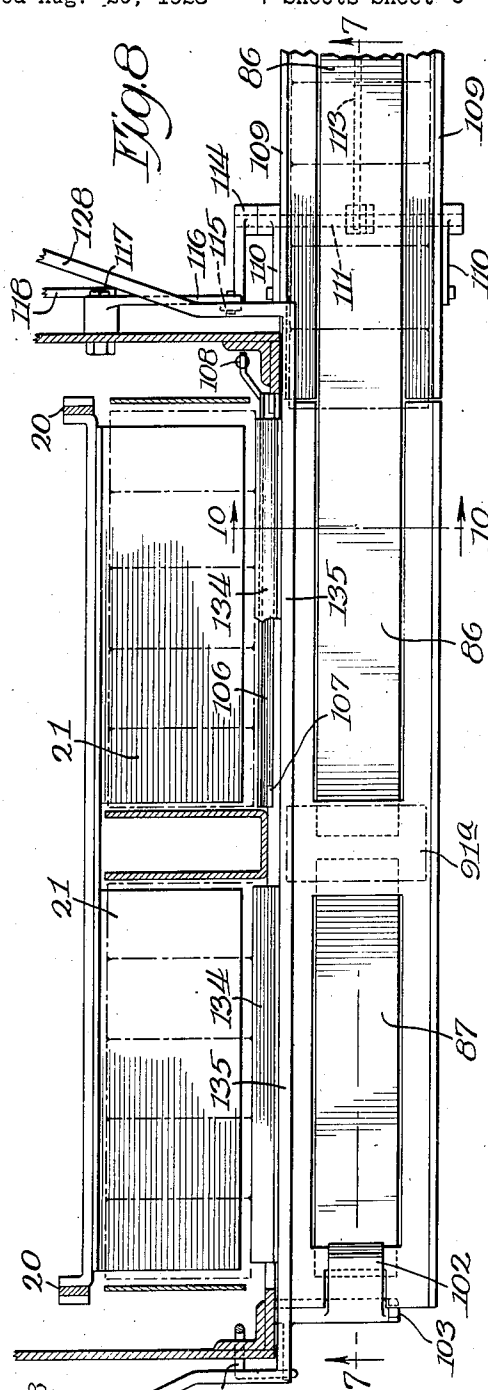
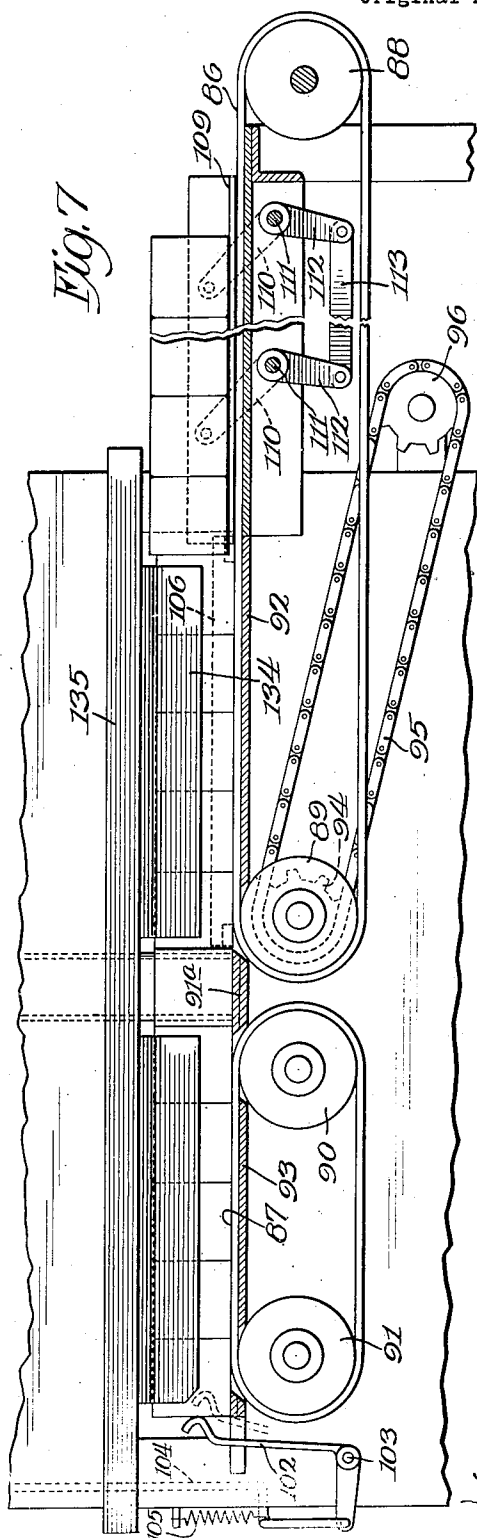
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PACKAGING MACHINE

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7 Sheets-Sheet 6



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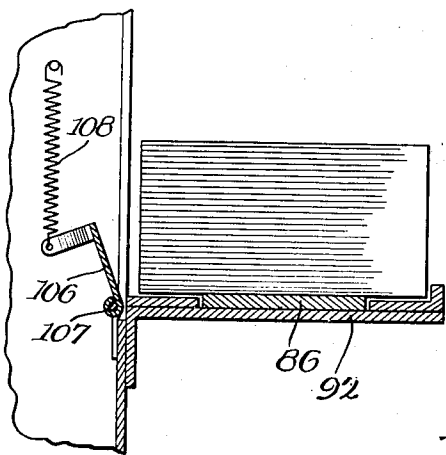
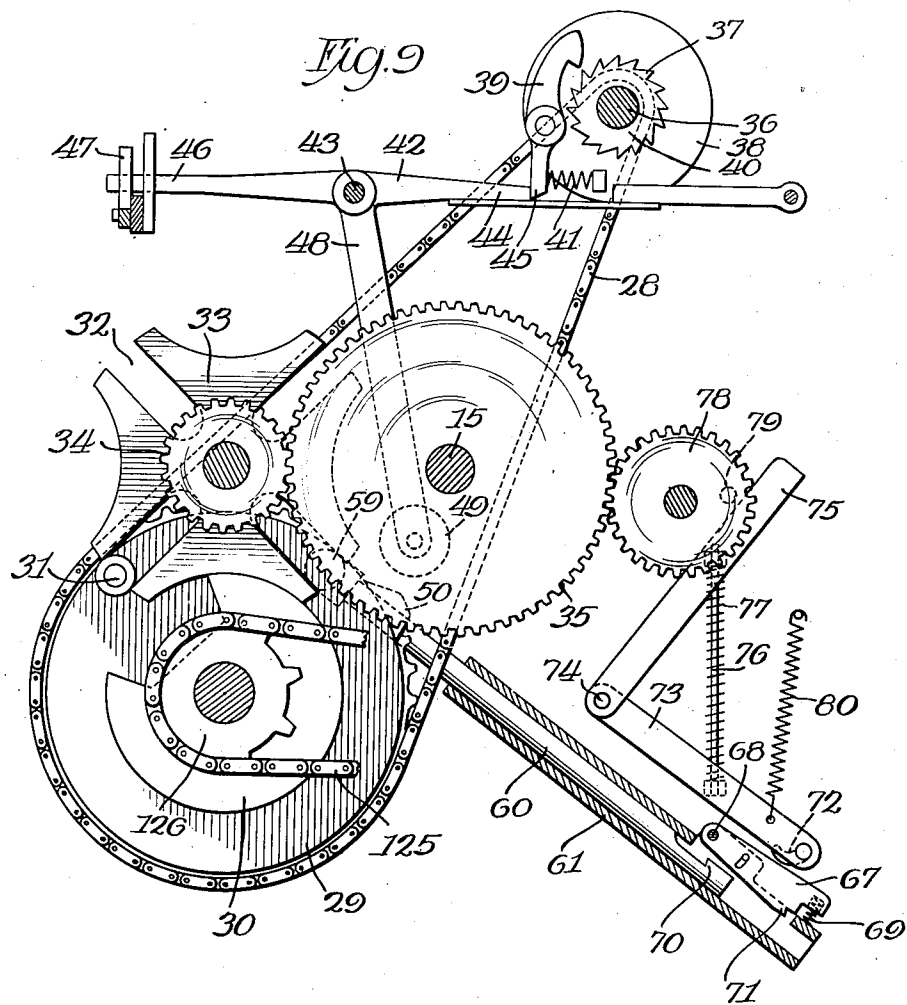
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UNITED STATES PATENT OFFICE

1,935,409

PACKAGING MACHINE

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Application August 20, 1928, Serial No. 300,750
Renewed January 7, 1933

8 Claims. (Cl. 226—14)

In my co-pending applications, Serial Numbers 152,357 and 288,957, there is shown and described improved packaging machines for placing containers or articles into a carton for shipping and storage purposes, embodying mechanism for automatically superposing a predetermined number of layers or rows of articles at a delivery station and then automatically ejecting the superposed layers into a carton or box, the box being ejected from the mechanism when it is filled with the articles.

In the said applications the articles are fed into the machine within the path of movement of the carrier, by means of the articles engaging each other and being moved for a considerable distance part way over a stationary support, the movement of the articles being arrested while the movement of the conveyor while contacting with the articles remains constant.

It is one of the objects of the present invention to provide improved means for positively feeding the articles into the machine for the entire length of travel of the articles before they are engaged and carried away by the conveyor, and improved means for bodily raising the articles with respect to the conveyor or moving them out of contact therewith, at a predetermined time in the cycle of operation of the machine, to arrest the feeding of the articles without interfering with the operation of the conveyor.

A further object is to provide improved means for removing the articles from the conveyor and placing them in position to be engaged and carried away by the carrier, and improved means for manipulating the said removing means so as to prevent engagement thereof with the articles that are being fed into the machine, and upon the return movement of the said moving means.

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 front elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a left hand end elevation of Figure 1.

Figure 3 is a detail vertical sectional view taken on line 3—3, Figure 1.

Figure 4 is a view partly in elevation and partly in section, as taken on line 4—4, Figure 1.

Figure 5 is an enlarged detail sectional view taken on line 5—5, Figure 1.

Figure 6 is a horizontal sectional view taken on line 6—6, Figure 1.

Figure 7 is a sectional view taken on line 7—7, Figure 8.

Figure 8 is a top plan view of Figure 7.

Figure 9 is a sectional view taken on line 9—9, Figure 1.

Figure 10 is a detail sectional view taken on line 10—10, Figure 8.

Referring more particularly to the drawings the numerals 15 and 16 designate shafts journaled in suitable bearings and extending across a supporting frame or casing 17, one of which shafts is preferably located adjacent the top and the other adjacent the bottom of the casing. Connected with the shaft 15 for rotation therewith are spaced sprocket wheels 18 and loosely mounted upon the shaft 16 are spaced sprocket wheels 19 over which pairs of endless carriers 20 pass. Connected with these flexible members are supporting platforms 21 which receive the articles to be loaded into a carton and carry them to a table or support 23 located at the delivery station of the machine.

Motion is imparted to the shaft 15 from a suitable motor 24 through the medium of a sprocket chain 25 which passes over a sprocket wheel 26, and connected with the sprocket wheel 26 for rotation therewith is a sprocket wheel 27 over which a sprocket chain 28 passes. This sprocket chain 28 also passes over a sprocket wheel 29 that has connected with it an element 30 of a Geneva movement. Connected also with the sprocket wheel 29 is a pin 31 adapted to engage in slots 32 of a Geneva element 33 to impart intermittent steps of rotation to the latter. Connected with this Geneva element 33 is a gear wheel 34 which meshes with a gear 35, the latter in turn being secured to the shaft 15 for rotation therewith so that as the motor 24 is operated, the sprocket wheel 29 will be rotated and this in turn will rotate the Geneva element 33, and through the medium of the intermeshing gears 34—35 the gear 35 will be rotated.

Connected with the shaft 36 upon which the gear 26 is secured, is a ratchet element 37 and loosely mounted upon the shaft is a disc 38 which carries a pawl 39 that co-operates with the ratchet element 37 for locking the disc 38 and the sprocket wheel 40 for rotation with the shaft 36 to connect the shaft with the motor 24. A spring 41 tends normally to move the dog 39 into engagement with the ratchet element 37. A lever 42 is pivotally mounted intermediate its ends as at 43 and one end 44 thereof is adapted to be moved into the path of movement of the end 45 of the dog 39 so as to trip the latter and render it inactive with respect to the ratchet element 37. The other end 46 of the lever 42 is adapted to engage under a catch 47 for holding the end 44 of the lever 42 so that the end 45 of the dog 39 will engage it to be tripped thereby.

Connected also with the lever 42 is an arm 48 having an anti-friction roller 49 connected there-

to and this anti-friction roller is adapted to be engaged by a cam surface 50 on the sprocket wheel 29 so that upon each complete revolution of the sprocket wheel 29 the lever 42 will be
 5 rocked so as to move the end 46 of the lever into a position to be engaged by the catch 47.

The articles to be packed into the carton are delivered to the machine and on to the platforms or carriers 21 to be carried by the latter
 10 to the delivery station and when at such station a plurality of articles from a plurality of carriers or platforms 21 are ejected by means of ejectors 51 which are connected to a reciprocating member 52, the latter extending across the frame or
 15 casing and moving in guides 53.

In the present form of the invention two sets of ejectors 51 are provided and are spaced laterally from each other and as the articles are moved from the platforms or carriers 21 and delivered to the supports or tables 23, they will be
 20 forced into cartons or containers 54 which are sleeved or telescoped upon tubular portions 55 forming extensions of the tables or supports 23.

The tubular portions 55 are spaced from each other laterally so as not to interfere with the seating of the carton or container thereon.

As the cartons are filled they will be ejected from the tubular portions 55 and will be received by fingers or holders 56 which have connected
 30 with them guide rollers 57 movable in suitable guides 58.

The ejectors 52 are given a reciprocatory movement by means of the sprocket wheel 29 to which is pivotally connected by one end as at
 35 59, a member 60 which telescopes with a member 61, the latter being pivotally connected by one end as at 62 with an extension 63 on the end of a link 64, the latter being connected by its other end to the shaft 16 and oscillated there-
 40 with. On the other side of the machine is a link 65 which corresponds with the link 64 which is connected by means of a link 66 with the ejector 52. The other end of the link 65 is keyed to the shaft 16 so that when the shaft 16 is
 45 rocked, the links 64 and 65 will reciprocate the ejectors.

Normally the elements 60 and 61 are adapted for free sliding movement but are adapted to be automatically locked together at a predetermined
 50 time in the cycle of operation of the machine by means of a lock or catch 67 pivotally mounted as at 68 and normally held inactive by means of a spring 69. The element 60 is provided with a shoulder 70, with which a shoulder
 55 71 on the catch 67 co-operates to lock the parts 60 and 61 together. This locking movement is effected by means of a cam 72 carried by an arm 73 which is pivotally mounted as at 74. Another
 60 arm 75 is pivotally mounted as at 74 and is connected with the arm 73 through the medium of a link 76 which is connected with one of the arms 73—75 and has a sliding movement with respect to the other arm. A spring 77 is interposed between the arms and tends normally to separate
 65 the arms.

A gear 78 meshes with the gear 35 and is provided with a pin 79 adapted to engage the arm 75 and move the latter about its pivot 74 to depress the spring 77 and thereby depress the arm
 70 73 to cause the cam 72 to depress the catch 67 against the stress of the spring 69, causing the shoulder 71 on the catch to engage the shoulder 70 on the element 60 and thereby lock the two for simultaneous movement. A spring 80 may be
 75 provided which tends normally to move the arm

73 in a direction to release the catch 67 when the pin 79 on the gear 78 passes out of engagement with the arm 75.

When the members 60 and 61 are locked together the ejectors will be reciprocated, but when
 80 they are unlocked the ejector will remain idle.

All of the above referred to parts constitute the subject matter of the aforesaid applications and are only described herein for the purpose of
 85 conveying a full and clear understanding of the present invention.

As the carton 54 is filled with the articles, the fingers or supports 56 will move outwardly and along the tracks or guides 58 until the rollers
 90 57 contact with the ends of the guides, at which time the fingers will swing downwardly about the rollers 57 as pivots. Links 81 are pivotally connected as at 82 with the fingers or supports 56 and by their other ends as at 83 with arms 84,
 95 the latter being pivotally mounted as at 85 with suitable supports so as to guide these parts and cause them to move in unison.

The articles to be placed in the cartons are fed into the machine by means of endless conveyors 86—87 (see particularly Figures 1, 7 and
 100 8), the conveyor 86 passing over suitable pulleys 88—89 and the conveyor 87 passes over pulleys 90—91, the two conveyors being arranged end to end and a support 91^a is arranged intermediate the proximate ends of the conveyors and beneath the space between the tubular portions 55.
 105 The upper runs of the conveyors 86—87 respectively pass over supports 92—93 and motion is imparted to the conveyor 86 preferably by means of a sprocket wheel 94 connected with the pulley 89 for rotation therewith, and a sprocket chain 95 which passes over the sprocket wheel 94 and also over a sprocket wheel 96. The sprocket wheel 96 is connected with a shaft 97 which is given motion by means of a gear connection 98
 115 with a sprocket wheel 99, and over this sprocket wheel 99 a sprocket chain 100 passes and the sprocket chain also passes over another sprocket wheel 101 arranged at one side of the machine. This sprocket 101 is preferably connected with
 120 the shaft 36 upon which the disc 38 and ratchet element 37 are connected. Inasmuch as the shaft 36 is continuously rotated the conveyor 86 will also be continuously operated.

The articles being fed by the conveyor 86 will
 125 advance until they pass upon and over the support 91^a on to the conveyor 87 so that the friction between the articles and a stationary support will not retard the progress of the articles but will insure their proper advancement.
 130 The articles are thus fed into the machine until the foremost article engages a trip device 102 pivotally supported as at 103 adjacent the end of the conveyor 87. This trip device actuates a rod 104 which is controlled by a spring 105 and
 135 the rod 104 in turn controls the operation of the catch 47 which controls the advancement of the carriers or platforms 21.

In order to maintain the articles in proper alignment and against being deflected laterally
 140 with respect to the conveyors 86 and 87, which would result if the feeding movement of the articles was arrested and the articles became jammed, suitable guides 106 are provided (see particularly Figures 6, 8 and 10). One of these
 145 guides is preferably arranged adjacent each of the conveyors 86 and 87 and on the side thereof adjacent the carriers or platforms 21. Each guide consists of an upright member pivotally mounted as at 107 and a spring 108 tends nor-
 150

mally to hold the guides in an upright position as shown more clearly in Figure 10. The springs 108 are of sufficient strength to hold the articles on the conveyor and against displacement laterally with respect thereto, thereby maintaining the articles in alinement on the conveyor. When, however, the articles are moved from the conveyors 86-87 in a direction transverse with respect to the line of travel of the conveyors, these guides or shields 106 will be engaged by the adjacent edges of the article to be depressed thereby so as not to interfere with the movement of the articles from the conveyors and on to the platforms or carriers 21. After the articles have passed over the guides, the spring 108 will return them to their normal position.

It is desirable when the articles are being fed by the conveyor 86 to arrest the feeding of the articles when a predetermined number of articles have been placed in the machine, and inasmuch as the conveyor 86 is continuously operating, it will be manifest that any articles resting thereon will be advanced by the conveyor. If the article is arrested while resting upon the conveyor, the conveyor would slip with respect to the article and the article would be forced against the last article inserted in the machine.

In order to overcome this objection there is provided a support comprising spaced members 109 which are arranged on opposite sides of the upper run of the conveyor 86 (see particularly Figures 4, 7 and 10). These supports 109 are arranged parallel with each other and when in their lowermost position the upper surfaces thereof will be disposed slightly below the upper surface of the upper run of the conveyor 86. The supports are connected together by means of arms 110 which depend therebelow and are pivotally connected thereto. The lower ends of these arms, any number of which may be provided, are connected with a shaft 111 for rocking movement therewith. Arms 112 depend below the shaft 111 and are secured thereto and a link 113 is pivotally connected with the arms 112 to cause them to move in unison. When the articles are fed on to the supports 109 by the conveyor 86 they will pass over the supports 109 and be held out of contact therewith. Just at the time when a predetermined number of articles are fed into the machine, the shaft 111 will be rocked, causing the supports 109 to rise with respect to the upper surface of the conveyor 86 and the support 92 and thereby lift the articles off of the upper run of the conveyor 86, so that the latter, while continuously operating, will not advance the articles which are held by the supports 109.

This rocking movement may be effected in any suitable manner, such as by means of a crank 114 secured to one of the shafts 111. Connected to the crank 114 (see particularly Figure 4) is a link 115 and the link in turn is connected with one of the arms of a bell crank lever 116 pivotally mounted as at 117. To the other arm of the bell crank lever 116 is connected a link 118 which in turn is pivotally connected as at 119 with another link 120, the latter being pivotally mounted as at 121 upon a suitable fixed support.

Connected with the shaft 122 is a cam 123 and connected also with the shaft 122 is a sprocket wheel 124 (see also Figure 2). Over this sprocket wheel 124 a sprocket chain 125 passes and the sprocket chain also passes over a sprocket wheel 126 (see also Figure 9) which is secured to the shaft to which the sprocket wheel 29 is con-

nected. Idlers 127 may be provided if desired, over which the sprocket chain 125 passes. Thus when the sprocket 29 is rotated in the manner already set forth, motion will be imparted to the shaft 122 by means of the sprockets 126, sprocket chain 125 and sprocket 124 to rotate the cam 123. This cam contacting with the link 120 will rock the latter about its pivot 121 and shift the link 118 to rock the bell crank lever 116, thereby rocking the crank 114 to rock the shaft 111 and thereby raise the supports 109.

After the active face of the cam portion 123 passes out of engagement with the link 120 the weight of the supports 109 and of the articles thereon will cause the supports 109 to be lowered so that the articles on the support will again rest upon the upper run of the conveyor 86 to be advanced thereby.

When the articles have been fed into the machine to the position indicated in dotted lines in Figure 7, that is when a predetermined number of articles have been fed by the conveyors 86 and 87, and before the supporting platforms 21 are raised, the articles will be removed from the conveyor and placed upon these supporting platforms.

In the present invention this is accomplished by means of links 129. One end of each link is respectively pivoted as at 130 to the respective arms 128 and the other end of the links is pivotally supported as at 131 to a fixed support. One end of each of the arms 128 is connected by means of a pivot 132 with a crank 133, the cranks being secured to the shaft 122 for rotation therewith.

The forward ends of the arms 128 project over the conveyors 86 and 87 and are disposed at a sufficient elevation thereabove so as not to interfere with the advancing movement of the articles by the conveyors. The forward ends of these arms 128 are connected together as at 134 and depending below this connection 134 are blades or fingers 135 which engage the articles on their outer side and draw them into the machine and on to the supporting platforms 21.

The operation of these arms is as follows. When the cranks 133 are rotated the arms 128 will be rocked about their pivots 130 so as to raise the blades or fingers 135 to a certain height so that they will pass over the tops of the articles on the conveyor, during a portion of the rotation of the cranks 133. The links 129 will also swing about their pivots 131 to permit of this operation. Upon another portion of the cycle of operation of the cranks 133 the arms 128 will move into the position shown in Figure 4 so that when the arms 128 are retracted the blades or fingers 133 will engage the articles and move them from the conveyors 86 and 87 into the machine.

It will thus be seen that with this construction the conveyor for feeding the articles into the machine may be placed in a position which is out of the way and at the same time will be accessible to the operator, and during the reciprocating movement of the blades or fingers 135 they will be moved to such a position that they will readily pass over the tops of the articles while the latter are being fed or positioned with respect to the machine to be removed by these blades or fingers.

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, with-

in the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A packaging machine embodying a conveyor
5 for feeding articles, means for actuating the conveyor, means for arresting the feeding of the articles by said conveyor, the last said means embodying mechanism for bodily moving a predetermined number of articles out of engagement
10 with said conveyor and while the conveyor remains active, and means controlled by the articles fed by the conveyor for rendering said arresting means active and inactive.

2. A packaging machine embodying a conveyor
15 for feeding articles, means for actuating the conveyor, means for bodily moving the articles to a position with respect to the conveyor that the latter will operate independently of the articles, said articles being moved in a direction transverse to the direction of feeding movement of
20 the articles by the conveyor, and means controlled by the articles fed by the conveyor for actuating said means for bodily moving the articles.

3. A packaging machine embodying a conveyor
25 upon which articles are delivered to be advanced thereby, means adjacent the path of movement of the articles by the conveyor for bodily lifting the articles from and holding them out of contact
30 with the conveyor whereby the conveyor will operate independently of the articles, and means controlled by the articles advanced by the conveyor for rendering the said lifting and holding means active and inactive.

4. A packaging machine embodying a conveyor
35 upon which articles are delivered to be advanced thereby, means adjacent the path of movement of the articles by the conveyor for bodily lifting the articles from and holding them out of contact
40 with the conveyor whereby the conveyor will operate independently of the articles, and means automatically rendered active when a predetermined number of articles have been fed by said conveyor for rendering said lifting and
45 holding means active.

5. A packaging machine embodying a conveyor for receiving and feeding articles, supports arranged along the line of travel of the conveyor

and normally disposed below the plane of the supporting surface of the conveyor and over which supports the articles are moved by the conveyor, and means rendered active when a predetermined number of articles have been fed by
80 said conveyor for raising the said supports to lift the articles out of contact with and hold them above the said conveyor to permit the conveyor to operate while the movement of the articles thereby is arrested.

6. A packaging machine embodying an endless flexible conveyor upon one run of which articles are delivered to be fed thereby, supports disposed along the line of travel of said run, on opposite sides thereof and normally below the supporting surface of said run, mechanism for raising and lowering said supports with respect to the conveyor to lift the articles out of contact with the conveyor and hold them thereabove,
95 crank mechanism for raising and lowering said supports, and means automatically rendered active when a predetermined number of articles have been fed by the said conveyor for rendering said raising and lowering mechanism active and
100 inactive.

7. A packaging machine embodying conveyors arranged end to end for successively receiving and advancing articles, means for arresting the feeding of the articles by the conveyors, means for removing the articles from the conveyors,
105 and means for bodily lifting some of the articles out of contact with one of the conveyors to arrest the feeding movement of the articles and while the last said conveyor remains active.

8. A packaging machine embodying conveyors
110 arranged end to end for successively receiving and advancing articles, means for continuously actuating one of the conveyors, the other conveyor being actuated by the articles being fed thereto by the first recited conveyor, means for
115 removing the articles from the conveyor, and means for bodily lifting some of the articles from the first said conveyor to arrest the feeding movement of the articles thereby while the operation of the last said conveyor remains constant.

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