

May 20, 1947.

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2,420,982

ARTICLE-FEEDING MECHANISM

Filed Oct. 25, 1944

2 Sheets-Sheet 1

Fig. 1

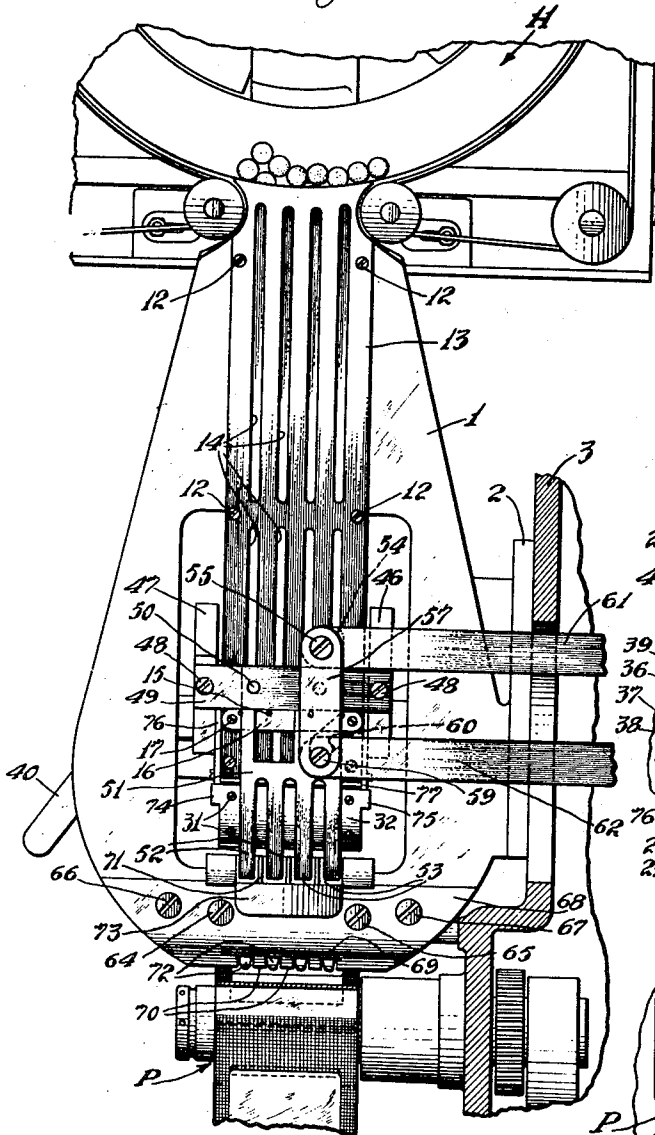


Fig. 2

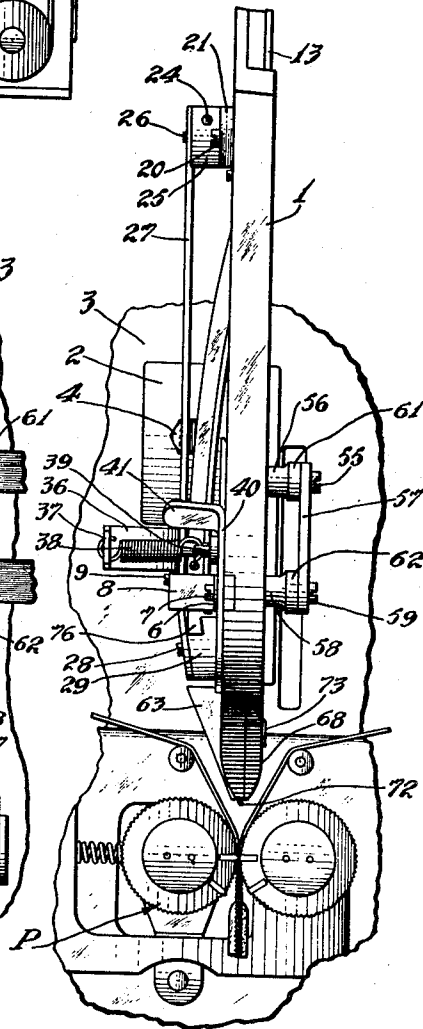
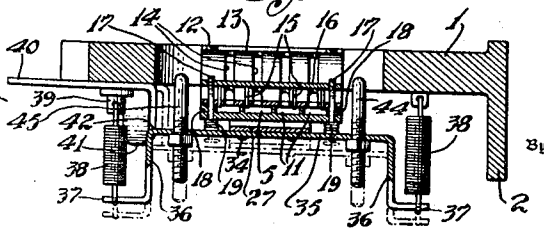


Fig. 3



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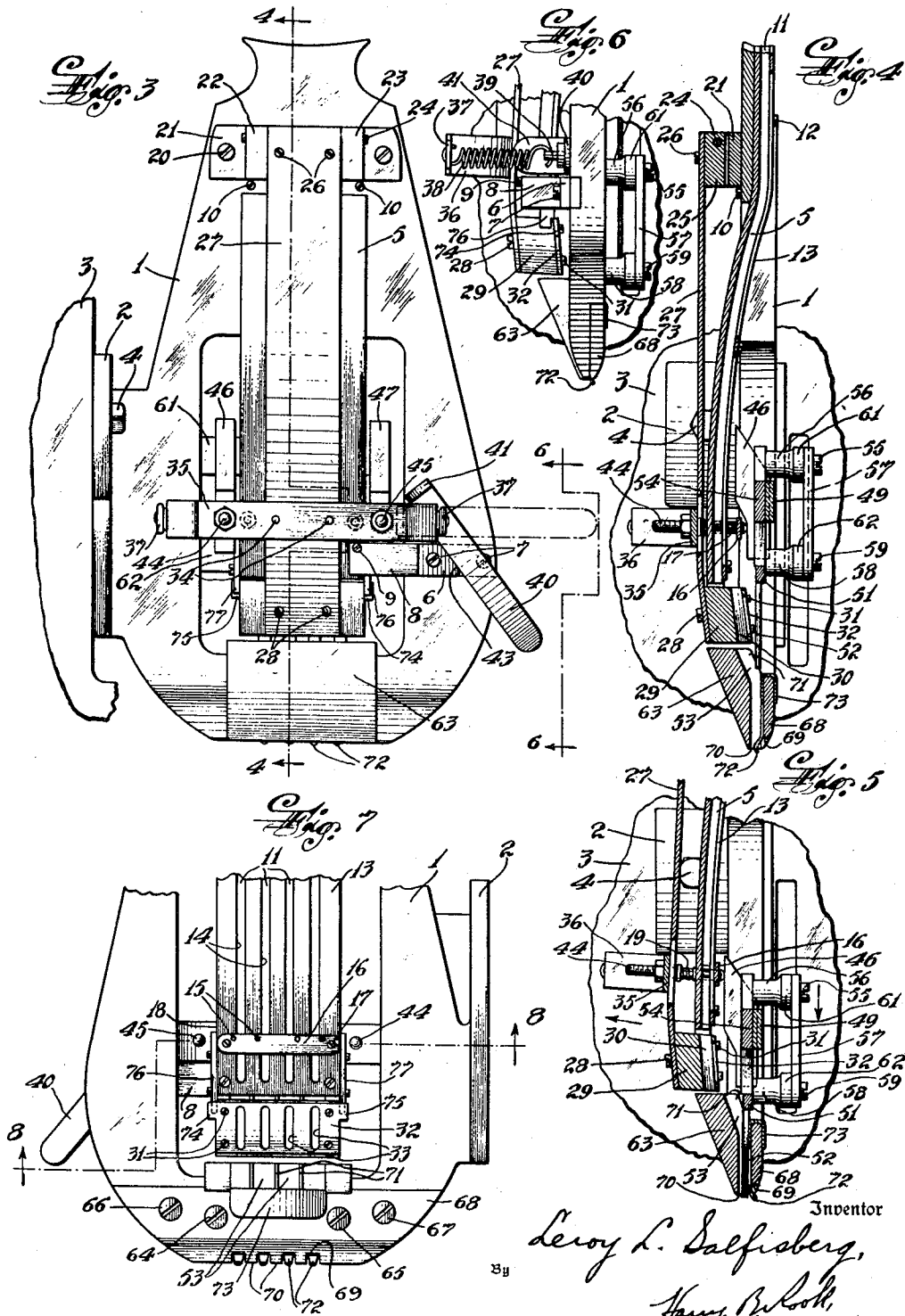
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ARTICLE-FEEDING MECHANISM

Filed Oct. 25, 1944

2 Sheets-Sheet 2



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2,420,982

ARTICLE-FEEDING MECHANISM

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Application October 25, 1944, Serial No. 560,306

11 Claims. (Cl. 93—3)

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This invention relates in a general way to a mechanism for automatically feeding small articles, such as tablets, pills, buttons and somewhat similar articles in succession from a source of supply, such as a hopper, to a predetermined position, from which they are passed into packages constructed to receive them.

It is one of the objects of my present invention to provide a new and improved structure for passing the articles to be packaged from the source of supply, such as a hopper, to the packages receiving them.

Another object of my invention is to provide an article-feeding mechanism in which the movable member carries only a definite number of articles to be packaged for each cycle of operation.

Another object of my invention is to provide a new and improved discharge portion of the article-feeding mechanism.

Another object of my invention is to provide an article-feeding mechanism which is equipped with manually operable means for shifting certain of the movable parts for cleaning purposes, as well as to permit passage of the articles to a position whereby when the apparatus is connected to the automatic control lever, the first cycle of the automatic operation will load the package.

Other and further objects will be discerned from a study of the following specification taken in connection with the annexed drawings wherein:

Figure 1 is a front plan view of my new and improved mechanism.

Figure 2 is a view of Figure 1, looking from left to right of that portion of Figure 1 involving my improvements.

Figure 3 is a rear view of the centrally disposed portion of Figure 1 to which my improvements relate.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a view of the lower portion of Figure 4, but with the movable parts in their second fully operated position.

Figure 6 is a view looking in the direction of 6—6 of Figure 3, with the hand lever in the position shown in dotted lines of Figure 3.

Figure 7 is a view of the lower portion of the structure shown in Figure 3, but looking from the front as in Figure 1, with certain parts comprising the discharging plunger removed.

Figure 8 is a view on the line 8—8 of Figure 7.

In the various views, wherein like numbers refer to corresponding parts, 1 is a frame member having a mounting flange 2 adapted to be fastened

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to a support 3 as by a screw stud 4. To the frame member 1, is fastened a chute 5 in any suitable manner. At the bottom, a bracket 6 is fastened to the frame member 1 as by screws 7. The bracket 6 has an offset arm 8 fastened to the chute 5 by a screw 9. At the top, the chute 5 is held to the frame 1 by a plurality of screws 10, two of which are shown in Figure 3. The chute 5 has a plurality of channels 11, four being used in the construction shown, and overlying these channels and fastened to the chute 5 as by a plurality of screws 12, is a plate 13. The plate 13 has a plurality of narrow longitudinal openings 14 over the channels, two being shown over each channel. These openings serve to show the passage of the articles through the channels.

Intercepting each of the channels 11, is a pin 15 passing through a hole in the plate 13 closely adjacent its associated opening 14. The pins 15 are fixed to a rigid strip 16 which is carried on two oppositely disposed screw studs 17 that are slidably disposed in clearance holes through the plate 13 and the side walls 18 of the chute 5.

Positioned between the head of each of the screws 17 and the chute 5, is a spring 19. The springs 19, acting against the heads of the screws 17, resiliently hold the strip 16 in place so that the strip 16, with the pins 15, will follow the movements of the other parts to be described.

Fastened to the back of the frame 1, as by screws 20, is a support member 21 having a pair of spaced lugs 22 and 23, between which is pivoted on a horizontal axis as by a pin 24 a member 25, on which is fastened as by rivets or screws 26 the upper end of a stiff arm 27 that extends downwardly in back of the chute 5. The lower end of the arm is curved slightly inwardly and has fastened thereto as by screws 28 a shifting block 29, the purpose of which will be later pointed out. The block 29 has a plurality of transversely positioned channels 30 which are in alignment with and substantially of the same character in cross-section as the channels 11 in the chute 5. With this construction, the arm 27 and block 29 are substantially balanced by gravity.

To the block 29, is fastened as by screws 31 a plate 32. The plate 32 has openings 33 substantially the same in width as the openings 14 in the plate 13. The plate 32 also has projections 74 and 75 at its opposite ends which are adapted to engage stop members 76 and 77 fastened to the opposite sides of the chute 5.

Fastened to the back of the arm 27, as by screws or rivets 34, is a cross-bar 35 having outwardly turned ends 36 which terminate in bent-over pro-

jections 37. The projections 37 have oppositely disposed notches therein to receive one end of a spring 38, while the opposite end of this spring is hooked to a stud 39 fastened to the frame 1. This same stud 39 acts as a pivot for a lever 40 having one end bent outwardly away from the frame 1 and terminating in a circularly shaped surface 41 that is adapted to engage the cross-bar 35 approximately at 42 where one of its ends 36 is bent outwardly. The operation of the lever 40 acts, through the cross-bar 35, to move the arm 27 and associated parts from one to the other of the two positions shown in Figures 4 and 5. When in the position more clearly shown in Figure 3, the lever 40 passes over a cut-away portion of the bracket 6 into engagement with a stop surface 43 on the bracket 6. When the lever 40 is moved to the position shown in dotted lines in Figure 3, the bent end, having the surface 41, hits against one edge of the offset arm 8 of the bracket 6.

The cross-bar 35 carries two adjustably mounted studs 44 and 45 having rounded ends which are adapted to engage cams 46 and 47 comprising parts of a plunger unit. The cams 46 and 47 are fastened by screws 48 to a bar 49. The bar 49 is preferably seated in recesses in the cams 46 and 47 so as to make a very rigid connection between these parts. Fastened to the bar 49, as by rivets 50, is a member 51 having a plurality of fingers 52, four being shown, disposed in spaced relation for cooperation with depositing channels 53 to which reference will be presently made.

The member 51 has a projection 54 with a hole therein to receive a stud 55 which carries a bushing 56 that supports one end of a link 57, the opposite end of which is supported on a stud 58 fastened to the link 57 by a screw 59. The stud 58 preferably terminates in and is adapted to be inserted through a slot 60 into a seat in the member 51. Intermediate the link 57 and the bushing 56, is an actuating lever 61, and between the link 57 and the stud 58, is an actuating lever 62. The actuating levers 61 and 62 extend to control members forming parts of the entire packaging machine such as illustrated in my Patent No. 2,083,617, issued June 15, 1937, and since these levers form no part of my present improvements, they need not be described further herein.

At the bottom of the frame 1, is fastened a triangularly shaped block 63 having channels 53 therein in alignment with the channels 30 in the shifting block 29. The block 63 is held to the frame 1 by screws 64 and 65 which also assist the screws 66 and 67 for holding a cover plate 68 in position on the frame 1 and over the channels 53.

The plate 68 has internally positioned transverse channels 69 therein as defined by the ribs 70 which come into close proximity with the lower portions of ribs 71 which define the channels 53. Positioned within the channels 53, are spring fingers 72 which are fastened by riveting or spot-welding to a U-shaped clip 73 that is adapted to be pushed over the upper edge of the cover plate 68. The free ends of the springs 72 are bent inwardly away from the plate 68 so as to stop the pellets or equivalent when they are passed into the channels 53 in a manner to be presently described.

The preceding description covers the construction of my improved packaging mechanism intended to be claimed herein, but in passing it may be mentioned that Figure 1 shows, at the

top, a hopper H and means for feeding the pellets or articles into the chute 5, while at the bottom of Figures 1 and 2 is shown the package-forming and sealing apparatus generally referred to as P, which is shown and described in my pending application Serial No. 468,762, filed December 12, 1942, and since the hopper and associated feeding apparatus and the package-forming and sealing apparatus form no part of my present invention, further description thereof seems to be unnecessary herein.

From what has been said, the operation of the structure to be claimed herein will be readily understood. When it is desired to start the apparatus automatically, the same may be preloaded, so to speak, and when the apparatus is preloaded the operations are as follows:

Assuming that the articles have been fed from the hopper into the channels of the chute, and the lever 40 is in what may be termed normal position—in which case the channels of the chute are filled and rest against the shifting block 29—the lever 40 is thrown to the dotted position of Figure 3, which moves the shifting block 29 from the position of Figure 4 to that of Figure 5, whereby the articles that were in the channels 11 will move into the channels 30, and the pins 15 will intercept another set of articles sufficient in number to fill the channels 30 in the block 29 on another part of the cycle of operations.

Now, throwing the lever 40 back to the full-line position of Figure 3, the block 29 is moved so that its channels 30 will be in alignment with the channels 53 in the frame block 63, and the articles in the block 29 will move into the frame block channels 53. At the same time, the pins 15 will be in retracted position and the articles in the chute channels 11 will move downwardly onto the block 29. At this point in the cycle of operations, the apparatus may be considered loaded, ready to discharge the articles from the frame block 63 into a package formed and ready to receive them by the packaging apparatus P.

With the feeding apparatus in this position, the machine for operating the levers 61 and 62 is set into movement and the cycle of operations is repeated as described, with the exception that the plunger unit, automatically operated, is operated by the levers 61 and 62 moving the member 51 with the fingers 52 downwardly into the channels 53 of the frame block 63, thereby forcing the articles out by the resilient springs 72. At the same time, the cams 46 and 47 engage their respective studs 44 and 45 which push the cross-bar 35 backwardly, together with its arm and associated shifting block. Then, after the articles are passed from the channels 11 into the channels 30 of the shifting block, the movement of the cams 46 and 47 is such as to allow the springs 38 to return the arm and shifting block, as well as the strip 16 with its pins 15, under the influence of the springs 19, to the normal position shown in Figure 4.

If the loading operation by the hand lever is not desired, the entire machine may be started up to run automatically, even though the first package may not be filled, assuming of course that there are no articles in the channels 53 of the frame block 63.

It may be mentioned in passing that since the hand lever 40 moves the shifting block 29 back and forth, it also serves the purpose of moving the shifting block 29 so that the channels 53 may be reached for cleaning purposes by first removing the plunger unit.

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From what has been said, it will be clear that I have provided a relatively simple apparatus for packaging a large quantity of articles in a short space of time, thereby greatly reducing the cost of the packaging operation.

If desired, the pins 15 may be omitted. They are provided primarily to hold the articles out of contact with the top of the shifting block during the rearward movement of the block, which is desirable to prevent chipping or abrasion of relatively fragile articles. Also, if desired, the springs 72 may be omitted; they are provided primarily to line up the articles before the latter are deposited in the package. If said springs are not used, then the plunger fingers 52 may be dispensed with.

What I claim is:

1. Article-feeding mechanism including a frame, a chute fastened to and extending longitudinally of the frame and having channels therein for conveying articles from a source of supply to the opposite end of the chute, and a plate at least partially covering the channels to hold the articles therein as they pass down the chute channels, an arm having a pivotal mounting at the end of the frame adjacent said source of supply and extending longitudinally of and adjacent the chute, a block carried on the free end of the arm and provided with channels corresponding in number and shape to the channels in the chute, spring-actuated means for normally holding said block in idle position and out of alignment with said chute channels, a plate over said arm block channels, a block carried by the frame and having depositing channels normally in operative alignment with the channels in the arm block, a cover for said frame block, resilient fingers carried by the last-mentioned cover and having their free ends positioned in said depositing channels for stopping the passage of the articles positioned in their respective channels under their combined weight and means for moving, during one part of its cycle of operation, said arm with its block in a direction to bring its channels into alignment with the channels in the chute, whereby articles will move by gravity from the chute channels into the arm block channels, said means also including fingers for simultaneously moving downwardly in the depositing channels to push the articles therein out into a container, said means also acting, during another part of its operative cycle, to allow the said arm and its block to return by said spring means to normal position and also withdrawing said fingers from the depositing channels, ready for another cycle of operation.

2. Article-feeding mechanism as set forth in claim 1, further characterized in that said spring-actuated means comprises a bar fastened to and extending crosswise of said pivoted arm adjacent said arm block and having formed ends to each of which one end of a spring is attached, while the opposite end of said spring is attached to the frame, said cross-bar carrying a pair of adjustable studs, the studs being spaced to extend one on each side of the chute and normally a distance beyond the chute cover for cooperation with said moving means.

3. Article-feeding mechanism as set forth in claim 1, further characterized in that said spring-actuated means comprises a bar fastened to and extending crosswise of said pivoted arm adjacent said arm block and having formed ends to each of which one end of a spring is attached, while the opposite end of said spring is attached to

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the frame, said cross-bar carrying a pair of adjustable studs, the studs being spaced to extend one on each side of the chute and normally a distance beyond the chute cover for cooperation with said moving means, and further characterized in that said moving means includes a pair of cams positioned, one over the end of each stud, with means for moving the cams to cause them to act on said studs to move the cross-bar, arm and shifting block carried by the arm for the purpose described.

4. Article-feeding mechanism as set forth in claim 1, further characterized in that said spring-actuated means comprises a bar fastened to and extending crosswise of said pivoted arm adjacent said arm block and having formed ends to each of which one end of a spring is attached, while the opposite end of said spring is attached to the frame, said cross-bar carrying a pair of adjustable studs, the studs being spaced to extend one on each side of the chute and normally a distance beyond the chute cover for cooperation with said moving means, and further characterized in that said moving means includes a plunger unit having a pair of spaced cams connected by a rigid bar which has a member fastened thereto carrying said downwardly extending fingers, the cams being positioned over said studs for the purpose described, the said member of the plunger unit being provided with means for the attachment of operating levers thereto.

5. Article-feeding mechanism as set forth in claim 1, further characterized in that said spring-actuated means comprises a bar fastened to and extending crosswise of said pivoted arm adjacent said arm block and having formed ends to each of which one end of a spring is attached, while the opposite end of said spring is attached to the frame, said cross-bar carrying a pair of adjustable studs, the studs being spaced to extend one on each side of the chute and normally a distance beyond the chute cover for cooperation with said moving means, and further characterized in that the chute has a cross-strip carrying spaced pins, one for each channel, which are adapted to intercept the chute channels, the strip being carried at its opposite ends on spring-mounted screw studs located in the chute at a distance from its lower end, but movable through clearance holes in the chute, whereby said pins will cross, at the proper time in the cycle of operations, their respective channels so as to intercept a number of articles sufficient to fill the cooperative channels in the arm block, the said screw studs having heads that are engaged by the arm cross-bar for moving the pins out of the chute channels during a part of the cycle of operations, while the springs associated with the screws will move the strip with its pins into intercepting position when said arm and its cross-bar are moved away from the chute.

6. Article-feeding mechanism as set forth in claim 1, further characterized in that said resilient fingers are carried by a clip which is adapted to be removably mounted over the edge of the frame block cover, while the cover itself has channels therein to receive and position the said resilient fingers in the frame block channels.

7. The combination of a unitary structure for feeding articles of the type described herein from a hopper containing the articles to be packaged to a packaging mechanism, and means for operating it, said unitary structure comprising a frame with means for mounting it for cooperation with the hopper and a packaging mecha-

nism, a chute extending downwardly from the hopper end of the frame and having a plurality of passages for the articles extending from a hopper throughout the length of the chute, an elongated arm mounted near the hopper end of the structure so as to have a swinging movement, a shifting block carried by the free end of the arm closely adjacent the lower end of the chute, means positioned near the lower end of the chute for moving across the chute passages to intercept a predetermined number of articles in the passages, said shifting block having passages therein for the articles in longitudinal alignment with the passages in the chute, means for normally holding the shifting block so its passages are offset laterally from the passages in the chute and for normally holding the intercepting means in non-intercepting position, a fixed block carried by the lower end of the frame and having passages normally in operative alignment with the passages in the shifting block when it is in normal position, resilient members having free ends positioned in the passages of the frame block so as to temporarily stop the movement of the articles therethrough as they are passed thereinto; said operating means including parts for initially moving the shifting block and intercepting means to a position where the shifting block passages are filled with articles that are intercepted, said means also including parts which simultaneously act with the movement of the shifting block to push the articles from the passages in the frame block to the packaging mechanism, and additional means comprising part of the unitary structure for returning the shifting block and intercepting means to normal position on the return movement of said initially moving means which acts to withdraw said push-parts from the passages in the frame block.

8. A combination for automatically feeding articles from a hopper to a packaging mechanism as set forth in claim 7, further defined in that the said means for initially moving the shifting block and associated parts, as well as those parts which push the articles from the passages in the frame block, comprises a plunger unit having a pair of spaced cams for acting on members carried by said arm of the unitary structure, and also having a member with the parts for pushing the articles from the passages in the frame block, said last-mentioned member having means for attaching operating levers thereto.

9. A combination for automatically feeding articles from a hopper to a packaging mechanism as set forth in claim 7, further defined in that the said means for initially moving all of the movable parts used in the automatic operation of the unitary structure comprises a unit plunger consisting of a pair of spaced cams for acting on members carried by the arm of said structure, and a member having extending fingers forming the parts which push the articles out of the pas-

sages in the frame block of the unitary structure, the plunger having means for attaching operating levers thereto.

10. An article-feeding structure for cooperation with a packaging machine for packaging the articles, comprising a frame, a chute supported by the frame and having at least one approximately vertical longitudinal channel for receiving the articles at the top of the frame from a source of supply, a block permanently fixed to the lower end of the frame and having channels corresponding in number to those in the chute and extending in the same general direction, a block movably positioned between the fixed block and the lower end of the chute and having channels the same in number as those in the chute and fixed block, and means for shifting the movable block so it will pick up a predetermined number of articles from the chute and then shifting said block so its channels will be in alignment with the corresponding channels in the fixed block, whereby the articles in the movable block will fall into the channels in the fixed block for subsequent discharge into a package, said movable block being carried on the lower end of a vertical arm which is mounted at its upper end above said block to swing on a horizontal axis, the arm having means adapted to be acted on by means operated by the packaging machine.

11. The machine as defined in claim 10 with the addition of means carried by the chute for intercepting a predetermined number of the articles in each channel of the chute for transmittal to the movable block at a stated time in its movement, said intercepting means including a strip extending transversely across the chute but normally spaced therefrom and being resiliently carried thereby so it will move toward the chute when said arm is pushed away from the chute, but will be moved away from the chute on the return movement of the arm, said strip having pins, one for each chute channel, which intercept a predetermined number of articles in the channels for transmittal to the block carried on the arm at the right time in the cycle of operations.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,709,189	Radtke	Apr. 16, 1929
2,311,251	Rees et al.	Feb. 16, 1943
443,254	Gilliland	Dec. 23, 1890
469,891	Arnold	Mar. 1, 1892
1,817,224	Ajouelo	Aug. 4, 1931

FOREIGN PATENTS

Number	Country	Date
212,801	Great Britain	Mar. 21, 1924