Nov. 10, 1931. G. W. MUDD 1,831,130

PACKAGING MACHINE

Filed Aug. 17, 1928 2 Sheets-Sheet 1

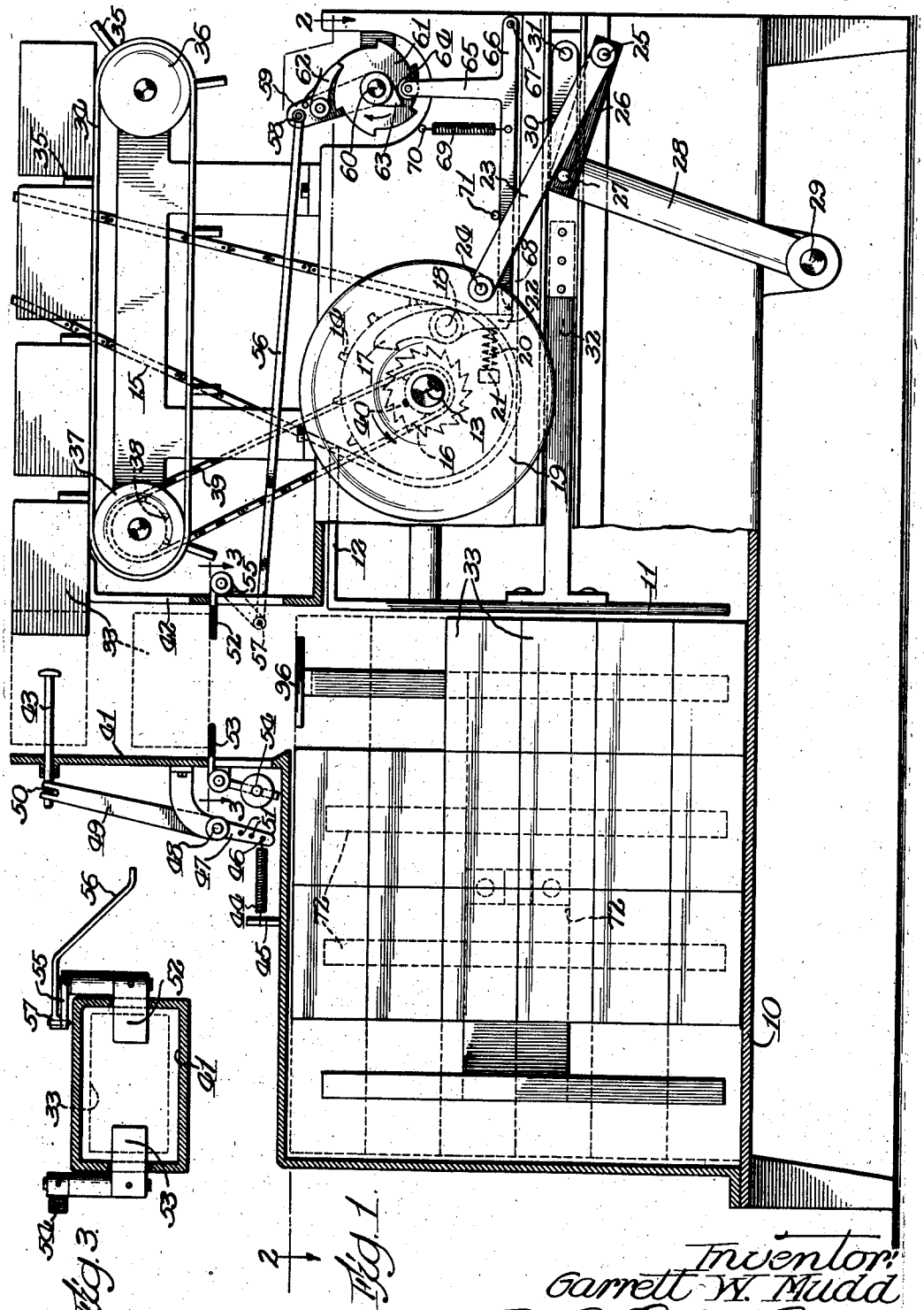


Fig. 3.

Fig. 1.

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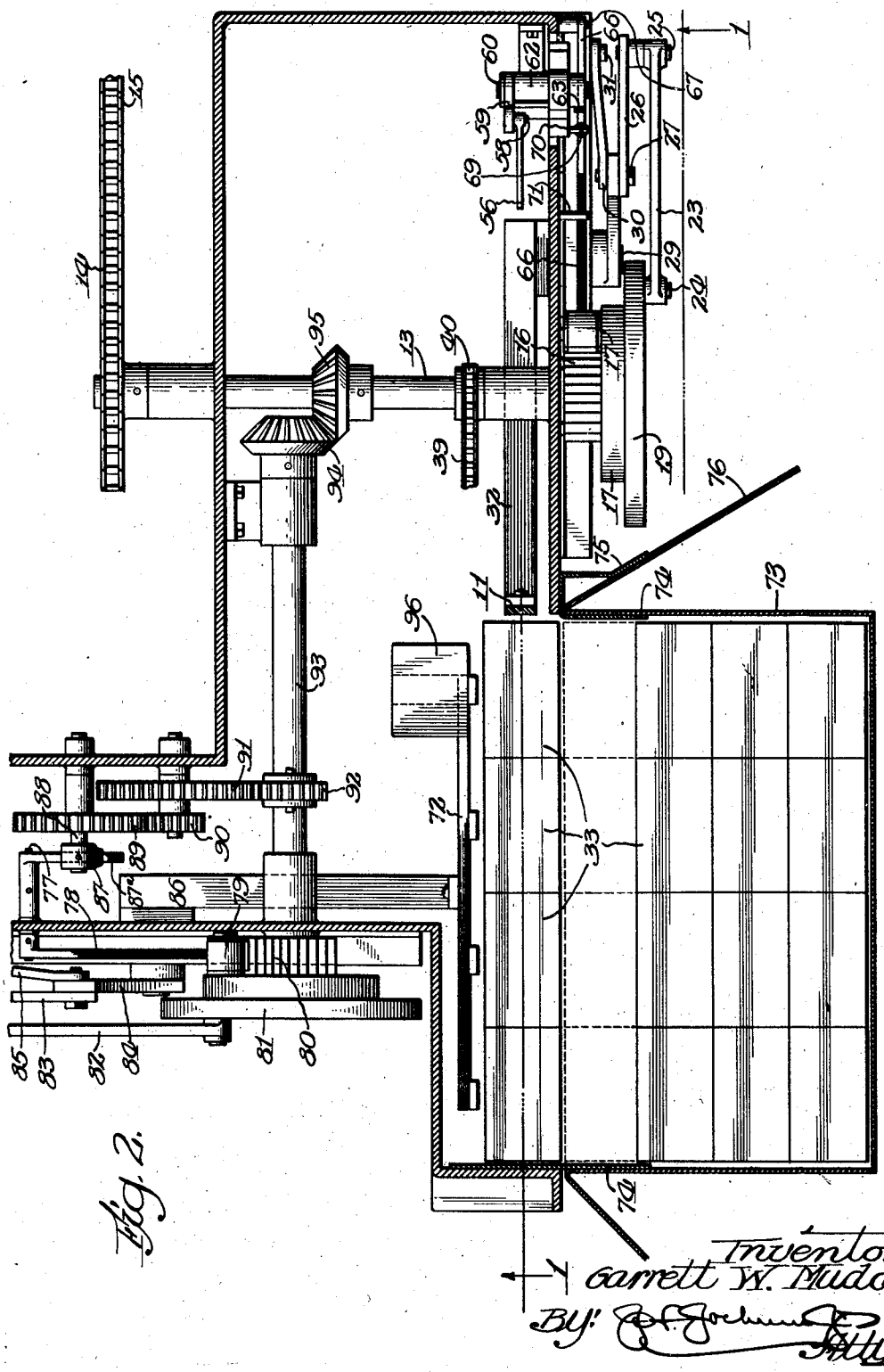


Fig. 2.

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1,831,130

UNITED STATES PATENT OFFICE

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PACKAGING MACHINE

Application filed August 17, 1928. Serial No. 300,211.

This invention relates to machines for placing or packing containers, cartons, and other objects in a position that they may be delivered or discharged into a case for shipment or storage purposes, and one of the objects of the invention is to provide improved means for conveying a predetermined number of cartons or articles to a supporting platform or table to be thereafter simultaneously shifted or moved thereupon to a position that they may be simultaneously moved from the supporting platform into a case.

A further object is to provide an improved machine of this character which will be of a simple and compact construction, and effective, efficient and automatic 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 vertical, longitudinal sectional view taken on line 1—1, Figure 2, of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a horizontal sectional view taken on line 2—2, Figure 1.

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

Referring more particularly to the drawings the numeral 10 designates a suitable supporting platform or table upon which the cartons are delivered.

Reciprocably mounted above the platform 10 is a plunger or ejector 11 which may be of any desired construction and is provided with a rearwardly deflected or flanged portion 12, and the plunger is adapted to be given a reciprocable movement in any desired or suitable manner. A simple and efficient means for accomplishing this result embodies a shaft 13 which is the main drive shaft of the mechanism, and this shaft receives its motion from any suitable source of power, preferably through the medium of a sprocket wheel 14 secured to the shaft and a drive belt or chain 15 which passes over the sprocket and is itself given motion from any suitable source of power (not shown). This shaft 13 is preferably continuously rotated and secured thereto for rotation therewith is a toothed element 16 with which a dog 17 cooperates. The dog 17 is pivotally mounted intermediate its ends as at 18 upon a disc 19, which latter is loosely mounted upon the shaft 13. A spring 20 is carried by the disc 19, one end of the spring resting against a fixed member 21 on the disc and the other end of the spring contacts with the end 22 of the dog 17 and tends normally to move the dog in a direction that it will engage the toothed element 16 and thereby lock the disc 19 for rotation with the shaft 13. A rod or member 23 is pivotally connected at one end as at 24 with the disc 19 and is connected at its other end as at 25 with a link 26, which latter is in turn connected as at 27 with an arm 28 pivotally mounted upon a support 29.

A link 30 is pivotally connected at one end as at 31 with an arm or stem 32 that is connected with the ejector 11 and the link 30 is pivotally connected at its other end preferably by means of the same pivot 27, with the arm 28 so that when the disc 19 is locked to the shaft 13 a rotation of the disc will cause a reciprocatory movement to be imparted to the plunger 11 and a rocking movement to the arm 28.

The articles 33 which are to be packed may be supplied in any suitable manner, preferably by means of an endless conveyor 34 having flights 35 thereupon suitably spaced and the conveyor passes over an idler 36 and also a pulley 37, the latter having connected with it for rotation therewith a sprocket wheel 38 over which a sprocket chain 39 passes and the sprocket chain 39 also passes over a sprocket wheel 40 which is connected with the shaft 13.

The articles 33 when placed upon the conveyor 34 will be delivered therefrom into a chute 41 and from the chute the articles will drop upon the supporting platform 10 until a predetermined number of articles have been superposed upon the platform or support 10, after which the ejector 11 will be operated and the predetermined number of superposed ar-

ticles will then be moved or shifted upon the supporting platform 10 so as to be moved out of the way of further articles being delivered upon the supporting platform and will be positioned in front of another ejector, to be hereinafter described, and by such latter ejector delivered into the casing.

As the articles are fed by the conveyor 34 they will pass from the conveyor into the chute 41 by reason of the fact that the flights 35 will be moved out of the way and will pass through a suitable slot 42 in one wall of the chute 41.

In order to maintain the forward end of the articles against dropping into the chute 41 before the article is completely delivered from the conveyor 34, any suitable means may be provided. To that end there may be provided a spring controlled member 43 which is arranged in the path of movement of the foremost advancing article to be engaged by the article and to co-operate with the adjacent flight 35 to frictionally hold the article until it is delivered in a proper position with respect to the chute 41 that it will drop therethrough. This is accomplished by means of a spring 44 which is anchored at one end as at 45 to a fixed support and is connected as at 46 with one end of an arm 47, which in turn is connected with a rock shaft 48. Secured also to the rock shaft 48 is an arm 49 which is connected as at 50 with the member 43. The arm 47 may be provided with a series of openings 51 whereby one end of the spring may be adjustably secured to the arm for varying the stress of the spring.

Arranged beneath the member 43 is a pivotally mounted member 52 with which another pivotally mounted member 53 co-operates. The member 53 is preferably provided with a counter-balance weight 54, and connected with the member 52 is an arm 55. These members 52 and 53 project into the chute 41 within the path of movement of the article 33 which has been delivered thereinto and serve as a means for temporarily supporting the article and are both adapted to be rocked by the article as the article passes from the chute 41 to be delivered upon the platform or support 10.

The operation of the member 52 by the advancing article also controls the operation of the plunger or ejector 11 and this is accomplished preferably through the medium of a rod 56 which is pivotally connected as at 57 with the arm 55 of the member 52. The other end of the rod is pivotally connected as at 58 with a pivotally mounted member 59 that rocks about a shaft 60.

Secured to the shaft 60 is a ratchet wheel 61 with which a spring controlled pawl 62 that is carried by the member 59 cooperates. Connected also with the shaft 60 for rotation therewith is a cam 63 which is adapted to engage an anti-friction roller 64 carried by an extension 65 on an arm or lever 66, the latter being pivotally mounted as at 67. One end 68 of the arm or lever 66 is adapted to be moved into the path of movement of the end 22 of the dog 17 which is carried by the disc 19. A spring 69 is connected by one end to the arm or lever 66 and is anchored as at 70 to a fixed support. The spring 69 tends normally to move the end 68 of the arm or lever 66 into the path of movement of the end 22 of the dog 17, and a stop 71 may be provided for limiting the movement of this arm 66. Thus when the end 68 of the arm 66 is moved into the position shown in Figure 1, and when the dog 17 is in engagement with the toothed element 16, and also when the disc 19 is rotating in the direction indicated by the arrow in Figure 1, it will be manifest that when the end 22 of the dog 17 engages the end 68 of the arm 66 the dog 17 will be rocked against the stress of the spring 20 to move it out of engagement with the toothed member 16 and thereby arrest the movement of the plunger or ejector 11.

The time in the cycle of operation of the machine at which the cam 63 will rock the arm or lever 66 is controlled by the number of teeth upon the ratchet 61 and the number of teeth on the ratchet corresponds to the number of packages or articles which it is desired to superpose upon the platform or support 10 before the plunger 11 is operated. Thus as the articles 33 pass the member 52 to rock it each articles will impart one step of rotation to the ratchet wheel 61 until the last article of the predetermined number engages and passes the member 52. At this time the cam 63 will rock the arm 66.

When the predetermined number of articles have been superposed upon the platform or support 10 in advance of the plunger 11, the plunger will be operated and will move the articles upon the supporting platform, causing the deflected portion 12 of the plunger to pass beneath the incoming articles and prevent them from being discharged from the chute 41 upon the supporting platform 10. After a predetermined number of operations of the plunger 11 to move a predetermined number of tiers or layers of the articles upon the supporting platform 10, the latter will be positioned in front of another ejector or plunger 72 to be moved by the latter upon the supporting platform 10 and in a direction transverse to the direction of the movement of the articles by the plunger 11. The plunger 72 in its operations will move the articles into a case 73, which latter is preferably sleeved upon a tubular member 74, the tubular member 74 being preferably provided with a flange 75 under which the flap 76 of the case passes so as to hold the flap out of the way.

The plunger or ejector 72 may be operated in any desired or suitable manner, but prefer-

ably in the same manner as the plunger 11 is operated. To that end there is provided a rock shaft 77 that has connected with it a rod 78 which is adapted to be positioned in the path of movement of one end of a dog 79, similar to the dog 17 that co-operates with the toothed member 80 carried by a disc 81, similar to the disc 19. This disc 81 is connected by means of a rod 82 through the medium of links 83—84 and arm 85 with a stem or projection 86 that is connected with the plunger or ejector 72, similar to the connection of the disc 19 with the plunger 11.

The rod 78 is adapted to be operated so as to release the dog 79 preferably by means of a cam 87 secured to a shaft 88, which shaft in turn is connected by means of gears 89—90 with a gear 91, the latter meshing with a gear 92 carried by a shaft 93, upon which shaft 93 the disc 81 is loosely mounted and the toothed element 80 is secured. The shaft 93 is connected by means of intermeshing gears 94—95 preferably of the beveled type, with the shaft 13. Thus it will be seen that motion will be imparted from the shaft 13 to the ejector 72, the relative times in the cycle of operation of the ejectors 11 and 72 with respect to each other being controlled by the gear connection.

If desired, the ejector 72 may be provided with a laterally projecting platform or support 96 adapted to be positioned under the chute 41 when the ejector 72 is advanced and the element 11 retracted. If desired, however, this platform 96 may be omitted as well as its support therefor so that, if desired, when the ejector or plunger 11 is retracted articles may be allowed to pass out of the chute 41 and be superposed upon the supporting platform 10 while the already superposed articles upon the supporting platform 10 are being ejected or moved therefrom into the case 73 by the plunger 72.

When the last supply of articles is delivered into the case 73, the case will be automatically stripped from the tubular member 74 while the delivery of the supply of articles by the plunger 72 which caused the case to be removed from the tubular member 74 will remain within the tubular member 74 to be delivered into the next case which is placed in position upon the tubular member 74.

With this improved construction the articles will be delivered by the conveyor 34 into the chute 41 and will be dropped therefrom on to the supporting platform 10 in advance of the plunger or ejector 11. After a predetermined number of articles have thus been superposed the ejector or plunger 11 will be operated while the ejector or plunger 72 is retracted and in an inoperative position. Upon the movement or retraction of the plunger 11 the plunger or ejector 72 will be rendered active while the plunger or ejector 11 is idle. Thus the plungers will work in alternation with each other at predetermined times in the cycle of operation of the machine, the plungers or ejectors working in planes intersecting each other.

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 supporting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, and a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger.

2. A packaging machine including a supporting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, and a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger, the said plungers operating in intersecting planes.

3. A packaging machine including a supporting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger, and means responsive to the delivery of the articles to the said platform for controlling the operation of one of said plungers.

4. A packaging machine including a supporting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger, and means operatively connected with one of said plungers for arresting the delivery of the articles to the platform during the operation of the last referred to plunger.

5. A packaging machine including a sup-

porting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger, a continuously operating shaft, and means individual to the plunger and automatically rendered active for connecting the respective plungers with said shaft for operation thereby at predetermined times in the cycle of operation of the machine.

6. A packaging machine including a supporting platform, means for delivering the articles to be packed successively on said platform in superimposed position to be moved across the platform, a reciprocating plunger for moving the superimposed articles across the platform when a predetermined number have been placed thereupon, a reciprocating plunger for delivering the articles from the platform after they have been positioned by the first said plunger, a continuously operating shaft, and means controlled by the articles to be packed for connecting and disconnecting one of said plungers with said shaft for operation thereby.

7. A packaging machine including a supporting platform, a passageway through which the articles are delivered to the platform, a reciprocable plunger for shifting the articles upon the platform, a conveyor for moving articles to be packed to a point adjacent the inlet of said passage, and means for assisting in positioning the articles and maintaining them adjacent the inlet of said passage until the article is properly positioned with respect to said passage said last named means operating upon the continued movement of the conveyor to release the article.

8. A packaging machine including a supporting platform, a passageway through which the articles are delivered to the platform, a reciprocable plunger for shifting the articles upon the platform, a conveyor for moving articles to be packed to a point adjacent the inlet of said passage, and means co-operating with said conveyor for temporarily holding the articles adjacent the inlet of said passage until the article is properly positioned with respect to said passage said last named means operating upon the continued movement of the conveyor to release the article.

9. A packaging machine including a supporting platform, a passageway through which the articles are delivered to the platform, a reciprocable plunger for shifting the articles upon the platform, a conveyor for moving articles to be packed to a point adjacent the inlet of said passage, and a yielding abutment co-operating with the conveyor and operating in conjunction therewith to temporarily hold and position the article with respect to the said passage.

10. A packaging machine including a supporting platform, a conveyor for moving articles to be packed to a point adjacent said platform, means for moving the articles upon the platform, actuating mechanism for the first said means, a yielding abutment adapted to be engaged and shifted by the articles as they are delivered to the platform, and means responsive to such movement of the abutment for rendering the first recited means active with respect to the said actuating mechanism.

11. A packaging machine including a supporting platform, a conveyor for delivering the articles to be packed, to a point above said platform, the articles being delivered by gravity to the platform after they leave said conveyor, a plunger for moving the articles which are upon the platform, operating mechanism for the plunger, and means adapted to be engaged and actuated by the articles as they are delivered to the platform after they leave the conveyor, for controlling the operation of said plunger with respect to its actuating mechanism.

12. A packaging machine including a supporting platform, a conveyor for delivering the articles to be packed, to a point above said platform, the articles being delivered by gravity to the platform after they leave said conveyor, a plunger for moving the articles which are upon the platform, operating mechanism for the plunger, means adapted to be engaged and actuated by the articles as they are delivered to the platform after they leave the conveyor, for controlling the operation of said plunger with respect to its actuating mechanism, and means connected with the plunger for receiving and supporting the articles that are being delivered by said conveyor at the time the said plunger is being actuated.

13. A packaging machine including a supporting platform, a conveyor for delivering the articles to be packed, to a point above said platform, the articles being delivered by gravity to the platform after they leave said conveyor, a plunger for moving the articles which are upon the platform, operating mechanism for the plunger, means adapted to be engaged and actuated by the articles as they are delivered to the platform after they leave the conveyor, for controlling the operation of said plunger with respect to its actuating mechanism, means connected with the plunger for receiving and supporting the articles that are being delivered by said conveyor at the time the said plunger is being actuated a second plunger for moving the articles with respect to said platform after they have been

positioned by the first said plunger, and means for automatically controlling the operation of the said second plunger.

14. A packaging machine including a supporting platform, a conveyor for delivering the articles to be packed, to a point above said platform, the articles being delivered by gravity to the platform after they leave said conveyor, a plunger for moving the articles which are upon the platform, operating mechanism for the plunger, means adapted to be engaged and actuated by the articles as they are delivered to the platform after they leave the conveyor for controlling the operation of said plunger with respect to its actuating mechanism, means connected with the plunger for receiving and supporting the articles that are being delivered by said conveyor at the time the said plunger is being actuated, a second plunger for moving the articles with respect to said platform after they have been positioned by the first said plunger, and means for automatically controlling the operation of the said second plunger, said plungers operating in intersecting planes.

In testimony whereof I have signed my name to this specification, on this 10th day of August, A. D. 1928.

GARRETT W. MUDD.