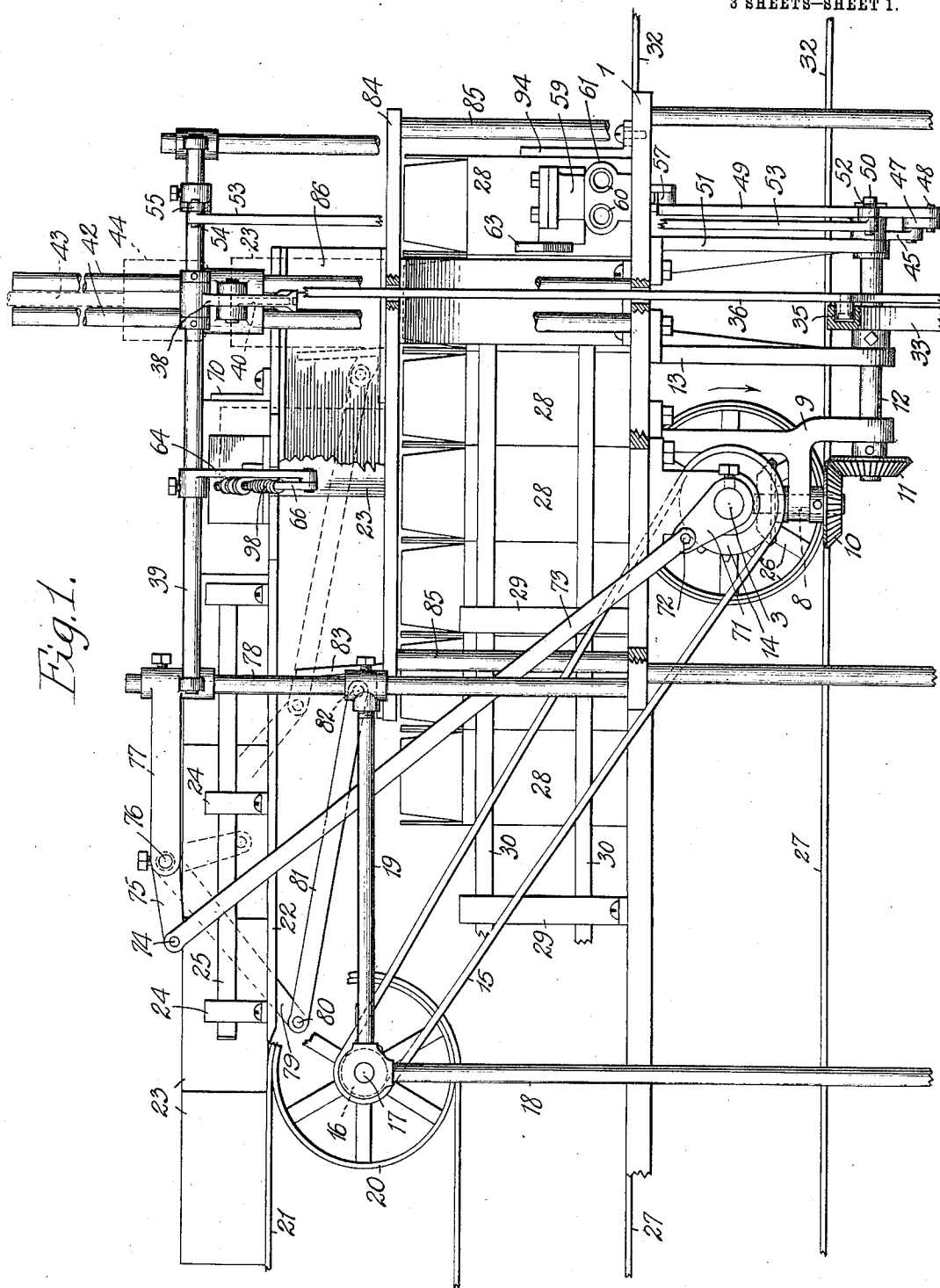


1,045,391.

G. GRAF.
PACKAGE INSERTING MACHINE.
APPLICATION FILED APR. 1, 1911.

Patented Nov. 26, 1912.

3 SHEETS—SHEET 1.



Witnesses:
Leonard W. Novaudes.
George E. Higham.

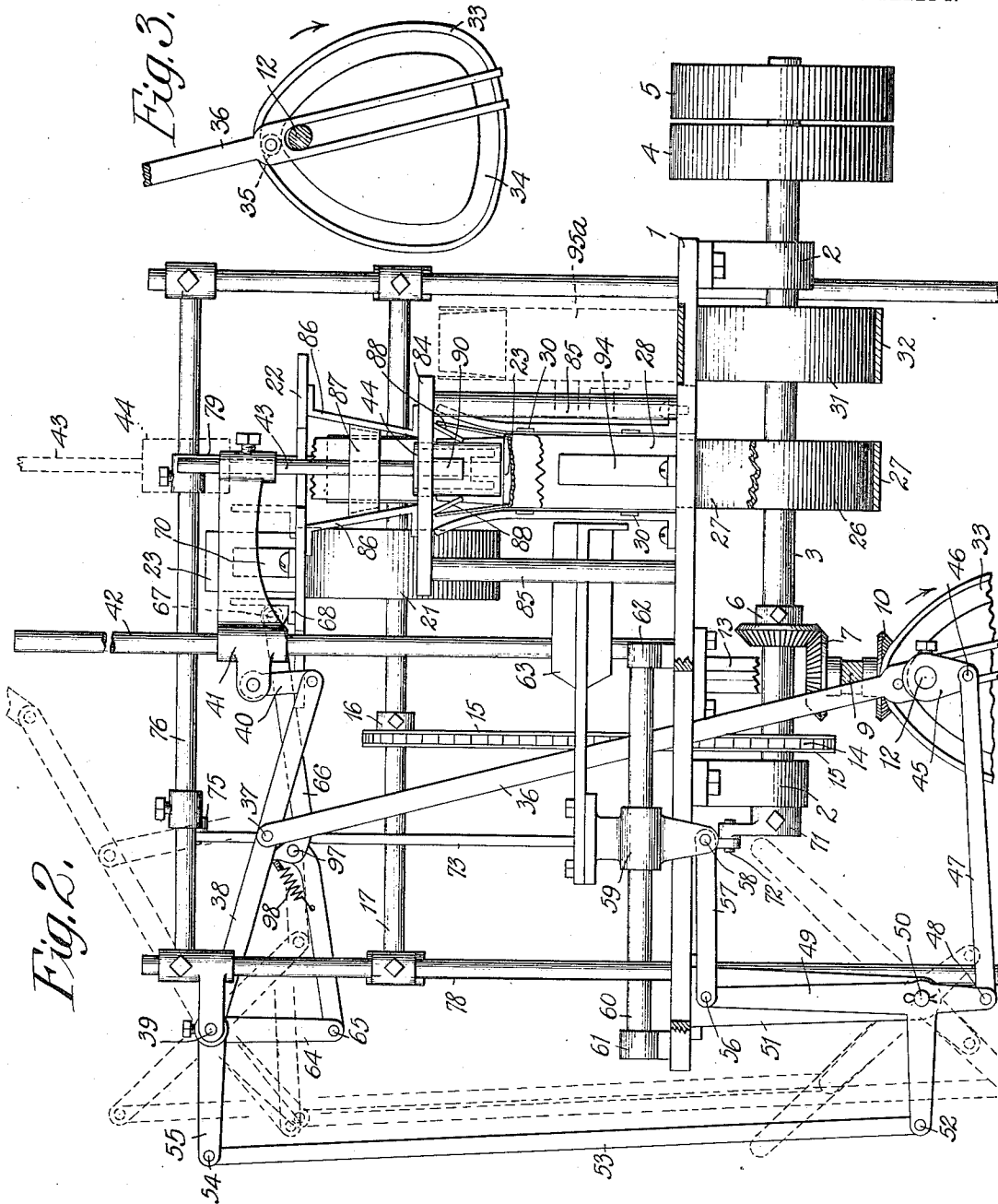
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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

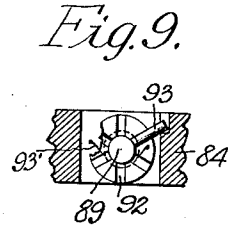
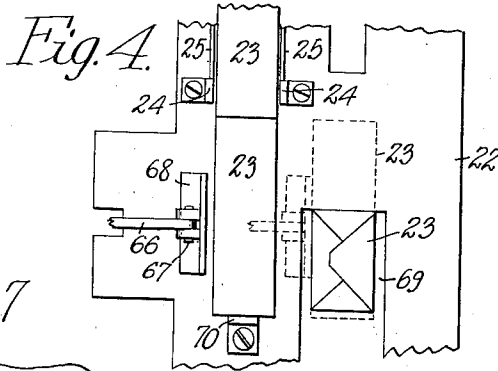


Fig. 7.

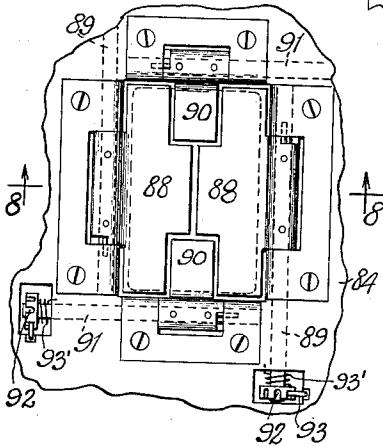


Fig. 5.

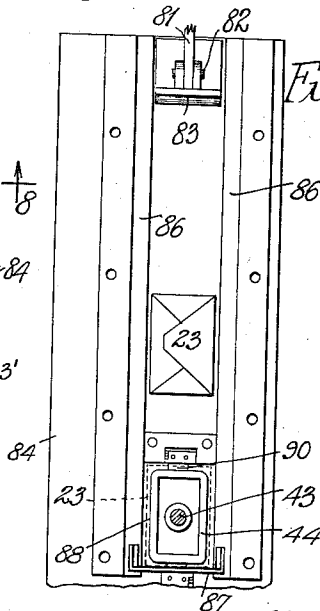


Fig. 10.

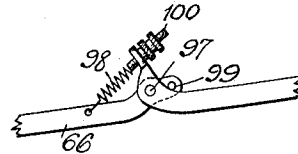


Fig. 8.

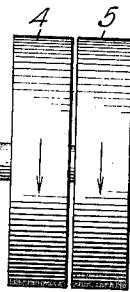
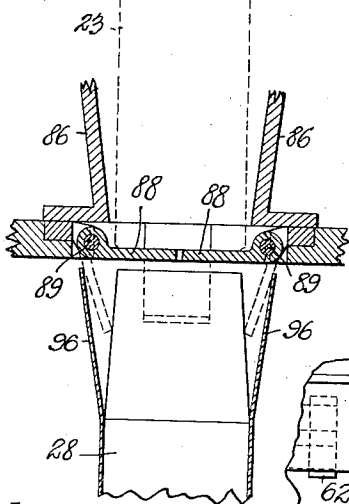
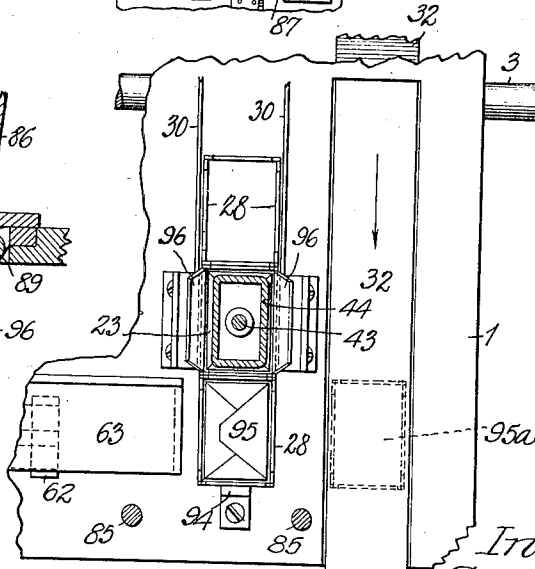


Fig. 6.



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UNITED STATES PATENT OFFICE

GEORGE GRAF, OF CHICAGO, ILLINOIS, ASSIGNOR TO CONRAD GRAF, OF CHICAGO, ILLINOIS.

PACKAGE-INSERTING MACHINE.

1,045,391.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed April 1, 1911. Serial No. 618,273.

To all whom it may concern:

Be it known that I, GEORGE GRAF, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Package-Inserting Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to mechanism for inserting packages of goods into inclosing shells and is particularly adapted for use where the inner package is designed to afford protection to the goods from moisture and dirt, while the outer shell is employed to protect the inner package from mechanical injury.

My invention is adapted for use in connection with any commodity such as various articles of food or confections which are preferably put up first in packages which are made moisture and dirt proof in one way or another and subsequently inserted into an outer casing to provide the requisite mechanical strength to the completed package for shipping purposes.

By my invention, the inner packages and the containing shells are fed to the machine automatically and after the packages have been inserted by the machine, the filled shells are removed automatically, it being unnecessary for an operator to be in attendance except occasionally to oil the machine and see that it is properly performing its work.

The several drawings illustrating my invention are as follows:

Figure 1 is a side view of the machine in its assembled condition. Fig. 2 is a right hand end view of the machine shown in Fig. 1. Fig. 3 is a detail view of the cam employed to operate the plunger of the machine. Fig. 4 is a top view of a portion of the upper plate or platform upon which the inner packages are fed to the machine. Fig. 5 is a top view of a portion of an intermediate plate or platform to which the packages are delivered from the upper plate or platform and upon which they are moved into position under the plunger. Fig. 6 is a top view of a portion of the main bed of the machine upon which the shells are fed into the ma-

chine, filled and removed from the machine. Fig. 7 is a detail top view of the trap doors employed in connection with the plate or platform shown in Fig. 5 to support the packages under the plunger. Fig. 8 is a sectional view of the parts shown in Fig. 7 taken along the line 8—8. Fig. 9 is a detail view of the spring mechanism employed to retain the trap doors shown in Fig. 7 in place. Fig. 10 is a detail view of one of the connecting rods employed in the machine.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1 and 2, the main bed 1 of the machine has secured to its under side two bearings 2 which support the main shaft 3 provided at its right hand end with tight and loose pulleys 4 and 5. The shaft 3 has secured thereto a beveled gear 6 meshing with a similar beveled gear 7 secured to the upper end of a shaft 8 supported from the bed 1 by a bracket 9. The lower end of the shaft 8 has secured thereto a beveled gear 10 meshing with a similar gear 11 carried by the left hand end of the shaft 12 as shown in Fig. 1. The shaft 12 is supported in suitable bearings formed in the bracket 9 and the bracket 13 secured to the bed 1. The shaft 3 has secured thereto near its left hand end a sprocket wheel 14 engaged by a chain 15, which also encircles a sprocket wheel 16 secured to a shaft 17 supported in suitable bearings by the posts 18 and braces 19. The shaft 17 has rigidly secured thereto a pulley 20 around which a carrier 21 of flexible material as leather or canvas is disposed, the upper side of such carrier being in line with the top of the upper plate or platform 22. The operation of the shaft 17 serves to move the carrier 21 to deliver the inner packages 23 upon the upper plate or platform 22. The inner packages 23 are kept in proper position upon such platform by means of the brackets 24 and the guide bars 25 supported by such brackets upon either side of the packages 23 and extending longitudinally of the carrier 21.

The shaft 3 has rigidly secured thereto a pulley 26 around which the carrier 27 is disposed, which carrier is similar to the carrier 21 with the exception that its upper surface is in line with the top of the main bed 1 of the machine. This carrier 27 serves

to deliver to the machine the empty shells 28 which are held in proper position upon the carrier 27 and the bed 1 by means of the brackets 29 and guide bars 30 which extend upon either side of such shells longitudinally of the carrier 27.

The shaft 3 has also secured to it a pulley 31 around which a carrier 32 is disposed similar to the carrier 27 in all respects except that it extends from the machine in an opposite direction, and this carrier is provided to remove the filled shells from the machine in a manner to be described.

The shaft 12 has rigidly secured thereto, as shown in Fig. 1, a cam 33, in the groove 34 of which a roller 35 travels, such roller being supported by the lower end of a connecting rod 36, the upper end of which is pivotally connected at 37 to the lever 38. The lower end of the connecting rod is forked as indicated to receive the shaft 12 in order to retain the lower end of the connecting rod in proper operating position relatively to such shaft. The lever 38 is loosely supported at its left hand end as shown in Fig. 2 upon the rock shaft 39 and is connected at its right hand end by means of a link 40 with an operating head 41 slidably supported by the vertical guide rods 42 secured at their lower ends to the bed 1 of the machine. The head 41 has extending downward from its right hand end, as shown in Fig. 2, a rod 43 which supports at its lower end a plunger 44, such rod being adjustable vertically in the head 41 to place the plunger in any desired position relatively to the head. The plunger 44 serves in its downward motion to engage one of the inner packages and force it downward into place in one of the shells which at this time is in a position to receive such package, and the adjustment of the plunger is such that when in its upper position due to the operation of the cam 33, the lower end of the plunger is above the upper end of the package to be engaged by it, and when in its extreme lower position, the lower end of the plunger must be substantially in the plane of the top of the body portion of the shell which has just been filled.

The extreme right hand end of the shaft 12, as shown in Fig. 1, has secured thereto a crank 45 pivotally connected at 46 with a link 47, the other end of which is pivotally connected at 48 with the lower end of a double bell crank lever 49 pivotally supported at 50 from the bracket 51. The left hand end of the bell crank lever 49, as shown in Fig. 2, is pivotally connected at 52 with the lower end of a link 53, the upper end of which is pivotally connected at 54 with the left hand end of a lever 55 secured to the rock shaft 39. The upper end of the bell crank lever 49 is pivotally connected at 56 to the left hand end of the link

57, the right hand end of which is pivotally connected at 58 with a block 59 slidably supported by the horizontal guide rods 60 so as to be capable of motion transversely of the carriers 27 and 32. The guide rods 60 are supported by the blocks 61 and 62 just above the top of the bed 1 of the machine. The block 59 has secured thereto a combined pusher and stop 63, the right hand end of which serves, when the block 59 is moved to the right as seen in Fig. 2 to move the filled package from its position in line with the carrier 27 to the position indicated in dotted lines upon the carrier 32, by which the filled package is then moved from the machine. When the pusher 63 occupies its extreme right hand position it also serves to prevent motion of the shells due to the carrier 27 and thus the removal of a filled package does not interfere with the filling operation in an adjacent shell.

The shaft 39 which is oscillated by continuous rotation of the crank 45, has rigidly secured thereto an arm 64, the lower end of which is pivotally connected at 65 with the left hand end of the connecting rod 66 as shown in Fig. 2, the right hand end of such connecting rod being pivotally connected at 67 with a pusher 68 supported upon the upper surface of the upper platform or plate 22. The pusher 68 is therefore reciprocated by oscillation of the shaft 39 and is properly guided so that when in its extreme left hand position, as shown in Fig. 2, it is to the left of the inner packages fed into the machine by the carrier 21, and when in its right hand position it has moved one of such inner packages to the feeding devices employed for delivering such inner package into the containing shell prepared to receive it. To accomplish this result, the upper platform 22 as indicated in Fig. 4, has formed therein a slot 69 so disposed that when the pusher 68 is moved to the right, the inner package engaged thereby is moved over the slot 69 which is so conformed as to extend under the package somewhat more than half of its length, and as the slot 69 is disposed vertically above the shells 28 which have been fed into the machine, the plunger 68 by its motion moves the package as indicated in dotted lines in Fig. 4, from which position the package drops through the slot 69 in such manner that it is turned upon one end so that it may be pushed down into the shell ready to receive it. The inner packages 23 are preferably fed into the machine by the conveyer 21 upon their edges, a stop 70 being provided upon the platform 22 to prevent their being moved beyond a proper position to be engaged by the pusher 68, and for this reason it is necessary to up-end the packages as a part of the filling operation.

The left hand end of the shaft 3, as shown

in Fig. 2, has secured thereto a crank 71 pivotally connected at 72 with the lower end of a connecting rod 73, the upper end of which is connected as indicated in Fig. 1 at 5 74 with the outer end of an arm 75 rigidly secured to a rock shaft 76 supported in brackets 77 from the vertical rods 78 secured to the bed 1 of the machine. The shaft 76 has also secured to it a second arm 10 79, the lower end of which is pivotally connected at 80 with the left hand end of a link 81, the right hand end of which is pivotally connected at 82 with the pusher 83 supported by the intermediate plate or platform 15 84, which intermediate platform is supported by posts 85 from the bed 1 of the machine. The inner package 23 as it is delivered through the slot 69 by the pusher 68, drops between guide walls 86, which serve 20 to properly direct the package and also to support the upper platform 22. The pusher 83 is guided to reciprocate between the guide walls 86 as the crank 71 continuously rotates, the motion of such pusher 25 being so designed that when it is in its left hand position as shown in Fig. 1, the inner package 23 may be dropped upon its end upon the intermediate platform 84 to the right of such pusher and when subsequently 30 such pusher is moved to the right, it carries such package to the position indicated in dotted lines in Fig. 1 immediately beneath the plunger 44 which at this time is in its upper position. A stop 87 is provided at 35 the ends of the guides 86 to prevent motion of the package 23 beyond its proper position under the plunger 44.

The package 23 when moved to its proper position under the plunger 44 rests upon 40 four small trap doors indicated in detail plan view in Fig. 7. Two of these doors 88 are similar and are supported upon and secured to rods 89 while the other two trap 45 doors 90 are comparatively small and extend into recesses formed therefor in the trap doors 88, all of such trap doors being in substantially the same plane and serving to support the inner package 23 moved upon them. The trap doors 90 are supported by and secured to rods 91. Each of 50 the rods 89 and 91 has disposed thereon in a suitable recess therefor in the platform 84 an adjusting head 92, to which is secured one end of a spring 93¹, the other end of which 55 is secured to the platform 84. The head 92 has formed in its outer face a plurality of slots adapted to engage a pin 93 secured in the rod 89 and extending therefrom to engage the platform 84 to form a stop for the 60 rod 89 and the associated trap door 88. The spring 93¹ thus serves to move the trap door to its horizontal position, which position is accurately determined by the stop pin 93 and any degree of tension desired may be 65 exerted to hold the door in such horizontal

position by turning the head 92 upon the rod 89, in which position it may be held by the engagement of one of the slots with the pin 93. In practice the tension exerted upon the springs 93¹ is such that the combined action of the trap doors 88 and 90 will support 70 a weight slightly greater than the weight of the package to be handled, thus reducing the amount of compression upon the package to a minimum as the package is forced 75 through the trap doors by the plunger 44 in filling the shell.

The trap doors 88 and 90 when moved to their lower position as indicated in dotted lines in Fig. 8 engage the inner surfaces of 80 the ends of the flaps extending from the empty shell which is in position to receive the package and by the action of the trap doors, the flaps are moved outward out of the way of the package and furthermore the 85 shell is trued up so that it is in proper shape to receive the package without any jamming or binding action, if for any reason before the engagement by the trap doors the angles of the shells were distorted and unequal. It 90 is to be understood that the shells employed for this purpose are usually made of press-board or card-board and that it is practically impossible to so construct them that they shall retain a right angle conformation 95 at their open ends when the flaps are extending outward. Thus it is of the utmost importance in connection with automatically filling the shells to provide means for positively and accurately shaping the upper ends 100 of the shells so that they may receive the inner packages easily, and this is one of the essential features of my invention.

It is to be understood that the shells 28 as they are fed into the machine by the carrier 27 are directly under the pusher 83 and 105 the plunger 44, the relation being shown in plan view in Fig. 6. A stop 94 is provided upon the bed 1 to permit the carrier 27 to move a filled shell such a distance beyond 110 its filling position as to bring the next empty shell immediately under the plunger 44 in a position to receive the next package. The filled shell 95 is thus moved from between the guide plates 96 into line with the pusher 115 63 which by its operation moves the filled package 95 to the position indicated in dotted lines at 95^a upon the carrier 32. The upper ends of the guide plates 96 flare outward as indicated in Fig. 2 so that the flaps 120 on the upper end of the shell may be held outward by the trap doors 88.

The connecting rod 66 is constructed preferably as indicated in Fig. 10 of two sections pivoted together at 97, such sections being 125 held normally in alinement by means of a spring 98 and a stop pin 99. An adjusting screw 100 is provided to change the tension upon the spring 98 as desired. As the pin 97 is located to one side of the center line of 130

the sections of the connecting rod 66, it will be observed that if for any reason a package 23 should jam under the action of the pusher 68, connecting rod 66 will yield at the joint 5 97 and thus prevent damaging the package, whereas normally the tension exerted upon the spring 98 is sufficient to move the package in the manner described above.

From the description above given, it will be understood that the carriers 27 and 32 10 which operate at the same rate of speed, and the carrier 21 which operates at an increased rate of speed due to the ratio between the sprocket wheels 14 and 16 serve to supply 15 the shells and packages to the machine and remove the same therefrom at practically the speed required by the operation of the filling mechanism. In practice it is preferable usually to drive the conveyers or carriers 20 at a rate somewhat in excess of that required so that the filling mechanism may be operated with certainty at its full capacity. For this condition there will be a certain amount of slippage between the carriers 25 and the packages when the latter strike the stops provided for them, but this does not constitute a disadvantage as the packages generally contain light material.

From the above description it will be understood that the operation of the machine is as follows, the various levers, connecting cranks and arms being so proportioned as to accomplish this result: The shells are fed into the machine between the 30 guide bars 30 until the end one is against the stop 94. The inner packages are fed into the machine until the end of one is against the stop 70. Assuming that the machine has been operating and that the end shell 35 has been properly filled and further that the plunger has been moved to its lowermost position, as shown in Fig. 2, to fill the shell immediately below the trap doors 88 and 90, continued rotation of the shaft 3 serves 40 to move the pusher 63 to the right, the pusher 68 to the left as shown in Fig. 2 and the pusher 83 to the right as seen in Fig. 1. It is to be understood that the pusher 68 has just previously to this time moved an inner 45 package so that it is now standing on end in the slot 69 upon the middle platform 84. As rotation of the shaft continues, the cam 33 raises the plunger 44, at the same time that the pusher 63 is removing the end filled 50 package, and the pusher 83 engages the package 23 in front of it and moves it toward the trap doors in such a manner that when the plunger is raised sufficiently to clear such package it is pushed into proper 55 position to be engaged by the plunger at its next downward stroke. When the cam 33 has been sufficiently rotated to completely raise the plunger 44, the pusher 63 has moved the end filled package upon the conveyor 32 and been brought back nearly or

quite to the position indicated in Fig. 2. At the same time the pusher 68 has been moved to the left and is now moving to the right and caused to occupy a position substantially as shown in Fig. 2 and the pusher 83 70 which has nearly completed its motion to the right, is moving the inner package under the plunger 44. The withdrawal of the combined pusher and stop 63 from the package just filled releases the filled package and the empty shells adjacent to it and the carrier 27 moves them along so that the filled package is against the stop 94 and the empty shell is moved under the trap doors 88 and 90. Continued motion of the shaft 80 3 rapidly moves the pusher 83 to the left as seen in Fig. 1; then the pusher 68 which is being moved to the right moves one of the inner packages 23 above the slot 69, thus causing it to drop on end in front of the pusher 83 and the pusher 63 is moved to the 85 left to complete its cycle of motion. This process is repeated for each shell filled and while the timing of the various operations may be changed considerably, the essential feature is first, that the plunger 44 is moved to its upper position, the shell just filled must be removed from under the trap doors 88 and 90 and an empty shell moved into its 90 place; second, that while the plunger is in its uppermost position, the inner package must be moved by the pusher 83 upon the trap doors 88 and 90; and third, that while the pusher 83 is to the left of the slot 69 as seen in Fig. 1, the pusher 68 must move an 100 inner package so that it is in a position in front of the pusher 83. The timing of the operation of the pusher 63 is not important as long as it removes a filled package at such a time as to permit the carrier 27 to advance 105 the last filled package against the stop 94 and bring an empty shell under the trap doors 88 and 90 while the plunger 44 is above such trap doors.

The trap door construction employed to support the inner packages is purposely made smooth on its lower side so that there will be nothing projecting beyond the lower surface of the middle platform 84 as such projections might be engaged by the flaps 110 formed on the shells 28. The cam 33 is purposely constructed so that the plunger 44 may be held in its uppermost position during a portion of each rotation of the shaft 12 in order that more time may be afforded 120 for properly placing the inner package and the empty shell for the next succeeding downward movement of the plunger 44. The trap door construction described above is adapted for use for holding open the 125 upper end of a shell during the filling operation regardless of the kind of material inserted into the shell, as the trap doors engage the upper end of the shell to hold it open equally well for any material that may 130

be passed through the trap doors into such shell, and I believe this feature of my invention is broadly new in connection with filling machines regardless of its particular application.

It is to be understood that while in the drawings one complete cycle of operation takes place for each rotation of the shaft 3 that this need not necessarily be the case in carrying out my invention, but that any relation desired may be employed, the essential feature being that the relative timing of the operations shall be as described above. It is further to be understood that I do not limit myself to the particular mechanism shown and described in carrying out my invention, but that I desire to claim any mechanical equivalents that may suggest themselves to those skilled in the art.

What I claim is:

1. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages on their sides to the machine, mechanism for moving a package onto its end and into alinement with a shell into which it is to be inserted, a plunger for moving the package into the shell, and a conveyer for moving the filled package from the machine.

2. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages on their sides to the machine, mechanism for moving a package onto its end and into alinement with an empty shell which is to receive such package, a yielding support for the package thus moved into alinement, a plunger for moving the package past the support into the shell, and a conveyer for removing the filled shell from the machine.

3. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages on their sides to the machine, mechanism for moving a package onto its end and into alinement with an empty shell which is to receive such package, a yielding support for the package thus moved into alinement, and a plunger for moving the package past the support into the shell.

4. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages to the machine, a reciprocating member for moving a package into alinement with a shell to be filled, trap doors for supporting the package in such position, adjustable springs for holding the trap doors in supporting position, a reciprocating plunger for engaging the package and moving it through the doors into such shell, a conveyer for removing the filled

shell from the machine, and mechanism for moving the filled shell after the filling operation onto the last named conveyer.

5. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages to the machine, a reciprocating member for moving a package into alinement with a shell to be filled, trap doors for supporting the package in such position, adjustable springs for holding the trap doors in supporting position, a reciprocating plunger for engaging the package and moving it through the doors into such shell, and a conveyer for removing the filled shell from the machine.

6. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages to the machine, a reciprocating member for moving a package into alinement with a shell to be filled, trap doors for supporting the package in such position, a reciprocating plunger for engaging the package and moving it through the doors into such shell, a conveyer for removing the filled shell from the machine, and mechanism for moving the filled shell after the filling operation onto the last named conveyer.

7. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine, a conveyer for delivering packages on their sides to the machine, a reciprocating member for moving a package onto its end and into alinement with a shell to be filled, a reciprocating plunger for engaging the package and moving it into such shell, and a conveyer for removing the filled shell from the machine.

8. In a package inserting machine, in combination with means for moving a package into an empty shell, spring supported devices for holding the package in position, and means for adjusting such springs.

9. In a package inserting machine, in combination with means for moving a package into an empty shell, trap doors for supporting the package, and adjustable springs for holding the trap doors in supporting position, and means for holding the shell beneath the trap doors to receive the trap doors within its upper end to hold it in place.

10. In a package inserting machine, in combination with means for moving a package into an empty shell, spring supported devices for holding the package in position, and means for holding the shell beneath said devices to receive the devices within its upper end to hold it in place.

11. In a package inserting machine, in combination with means for moving a package into an empty shell, devices for support-

ing the package in position to be inserted, such devices yieldable to permit the entry of the package into the shell and means for holding the shell beneath said devices to receive said devices within its upper end to hold it in place.

12. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine with their open ends uppermost, a second conveyer for delivering packages on their sides to the machine above and to one side of the shells, a pusher for moving one of such packages above the shells, mechanism for turning such package on end, a vertically movable plunger, a second pusher for moving such package on end below the plunger, trap doors for supporting the package in such position over the upper open end of a shell moved to a position to receive such package by the first conveyer, adjustable spring mechanism for holding the trap doors in horizontal position, means for moving the plunger to force the package downward through the trap doors into the empty shell, a third conveyer disposed by the side of the first conveyer, and a third pusher for moving a filled shell onto the third conveyer.

13. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine with their open ends uppermost, a second conveyer for delivering packages on their sides to the machine above and to one side of the shells, a pusher for moving one of such packages above the shells, mechanism for turning such package on end, a vertically movable plunger, a second pusher for moving such package on end below the plunger, trap doors for supporting the package in such position over the upper open end of a shell moved to a position to receive such package by the first conveyer, adjustable spring mechanism for holding the trap doors in horizontal position, means for moving the plunger to force the package downward through the trap doors into the empty shell, and a third pusher for removing a filled shell.

14. In a package inserting machine, the combination of a conveyer for delivering empty shells to the machine with their open ends uppermost, a second conveyer for delivering packages on their sides to the machine above and to one side of the shells, a pusher for moving one of such packages above the shells, mechanism for turning such package on end, a vertically movable plunger, a second pusher for moving such package on end below the plunger, trap doors for supporting the package in such position over the upper open end of a shell moved to a position to receive such package by the first conveyer, adjustable spring mechanism for holding the trap doors in horizontal position, means for moving the plunger to force

the package downward through the trap doors into the empty shell, a third pusher for removing a filled shell, and mechanism for operating the pushers and plunger to bring the packages successively into inserting position and fill and remove the shells from the machine.

15. In a package inserting machine, the combination of means for delivering packages to the machine, means for delivering empty paper shells to the machine, a device for moving a package into inserting position relatively to a shell to be filled, a member for moving the package into the shell, mechanism for supporting a package and aligning a shell therewith a device for removing a filled package, and mechanism for operating such devices to successively move the shells one after another into inserting position, insert a package into each of the shells thus placed and to remove the filled package from the machine.

16. In a package inserting machine, the combination of a platform for receiving the packages to be inserted, means for feeding an empty flexible shell into inserting position beneath the platform, and a yielding support for a package to be inserted, said support being mounted in the platform so that its under surface is substantially in the plane of the lower surface of the platform.

17. In a package inserting machine, the combination of a platform for receiving the packages to be inserted, means for feeding an empty flexible shell into inserting position beneath the platform, trap doors for supporting a package about to be inserted, said trap doors being pivotally connected to the platform so that their under sides are substantially in the plane of the bottom surface of the platform, and springs for holding the trap doors in supporting position.

18. In a package inserting machine, the combination of means for feeding an empty shell into inserting position, devices for moving a package from its inserting position into an empty shell, and mechanism for feeding the packages into the machine on their sides and turning them on end into inserting position.

19. In a package inserting machine, the combination of means for feeding an empty shell into inserting position, devices for moving a package from its inserting position into an empty shell, and a member for moving a package toward its inserting position, said member having a yielding construction so that it becomes inoperative when the thrust exerted upon it exceeds a predetermined amount.

20. In a package inserting machine, the combination of means for feeding an empty shell into inserting position, devices for moving a package from its inserting position into an empty shell, and a pusher rod

for moving a package toward its inserting position, said pusher rod having a yielding joint, and a spring for normally holding the rod in operative position and adapted to yield to prevent motion of the package when the thrust upon the rod exceeds a predetermined amount.

21. In a package inserting machine, the combination of means for feeding an empty shell into inserting position, devices for moving a package from its inserting position into an empty shell, a pusher rod for moving a package toward its inserting position, said pusher rod having a yielding joint, a spring for normally holding the rod in operative position and adapted to yield to prevent motion of the package when the thrust upon the rod exceeds a predetermined amount, and devices for adjusting the tension on said spring.

22. In a package inserting machine, the combination of a platform for receiving the packages to be inserted, means for feeding an empty shell into inserting position beneath the platform, trap doors mounted upon the platform for supporting a package in inserting position, spring for holding the trap doors in supporting position, and devices for adjusting the tension on the springs.

23. In a package inserting machine, the combination of a platform for receiving the packages to be inserted, means for feeding

an empty shell into inserting position beneath the platform, and trap doors mounted upon the platform for supporting a package in inserting position, said trap doors so disposed that they are within the upper end of a shell and engage opposite sides thereof when the trap doors are in inserting position.

24. In a package inserting machine, the combination of a platform for receiving the packages to be inserted, means for feeding an empty shell into inserting position beneath the platform, and trap doors for supporting a package in inserting position, said trap doors during an inserting operation engaging the inside of a shell about to be filled and alining it with said package.

25. In a package inserting machine, the combination of means for delivering packages to the machine, means for delivering empty flexible shells to the machine, a device for moving the packages one at a time into the empty shells, and mechanism for successively moving the shells one after another into inserting position and removing the filled shells one at a time from the machine.

In witness whereof, I hereunto subscribe my name this 28 day of March, A. D., 1911.

GEORGE GRAF.

Witnesses:

ALBERT C. BELL,
CONRAD GRAF.