H. DE ESCOBALES.

PACKAGING MACHINE.

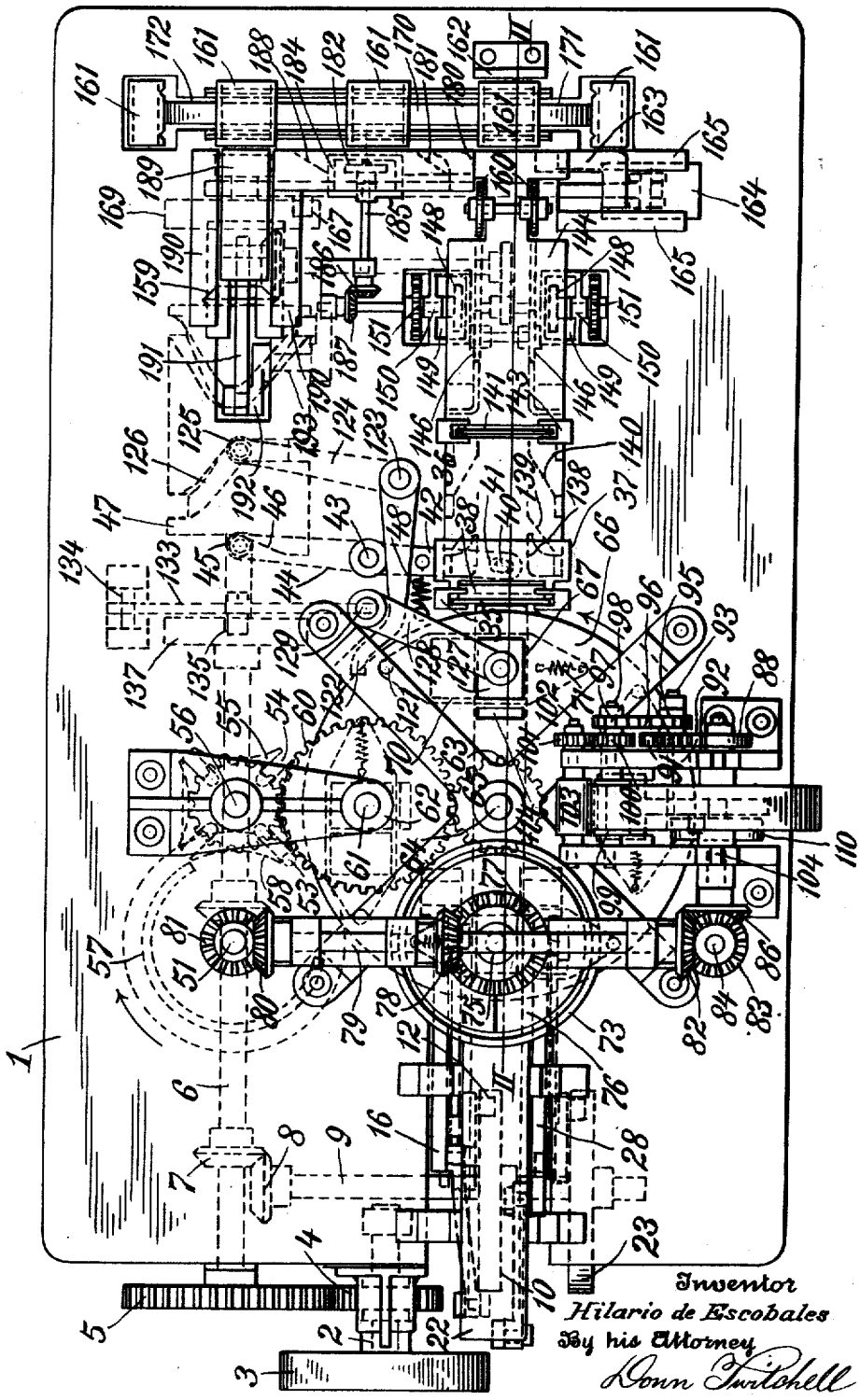
APPLICATION FILED AUG. 20, 1917.

1,309,122.

Patented July 8, 1919.

4 SHEETS—SHEET 1.

FIG. 1.



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4 SHEETS—SHEET 2.

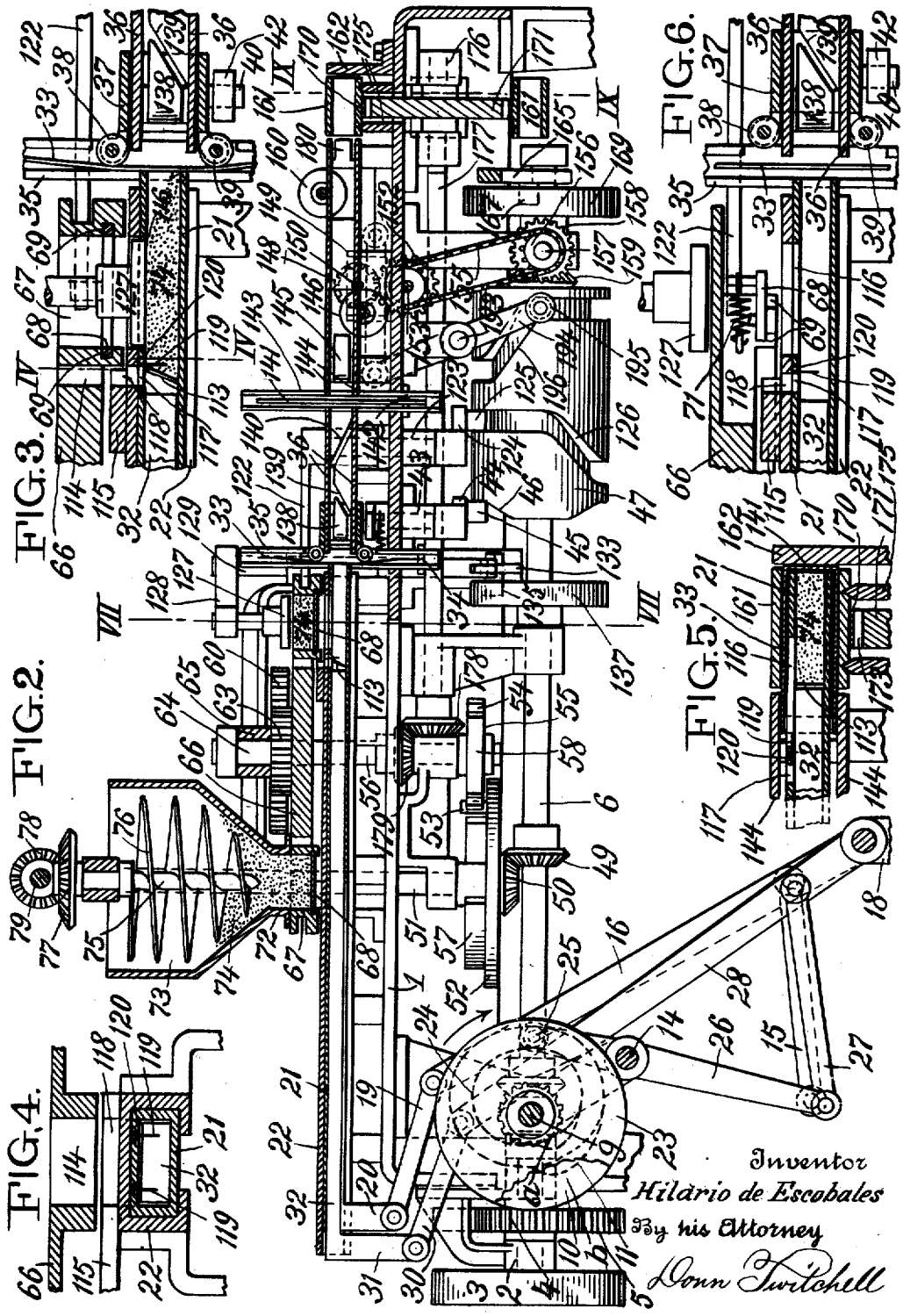


FIG. 3.

FIG. 2.

FIG. 4.

FIG. 6.

FIG. 5.

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4 SHEETS—SHEET 3.

FIG. 7.

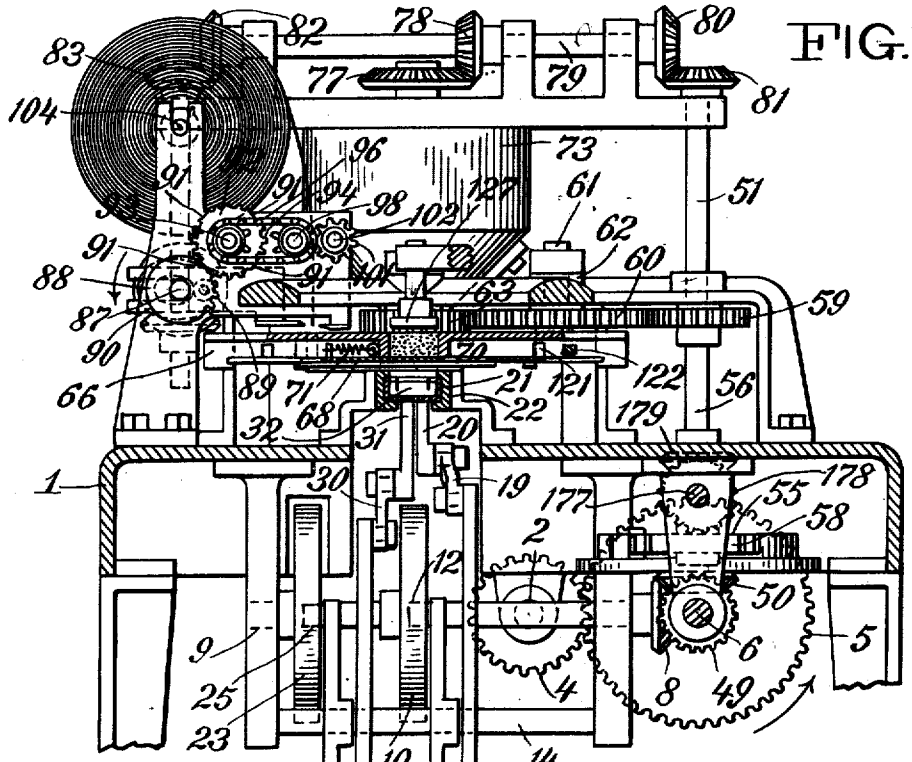


FIG. 8.

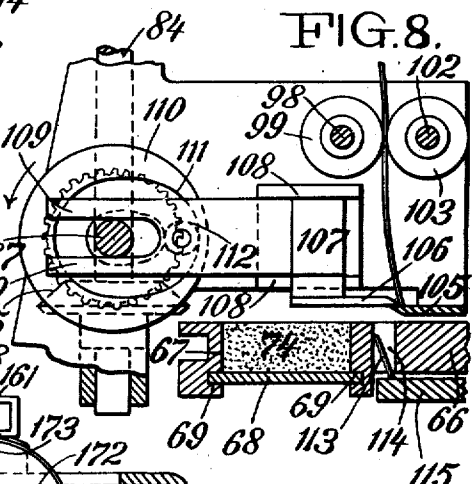
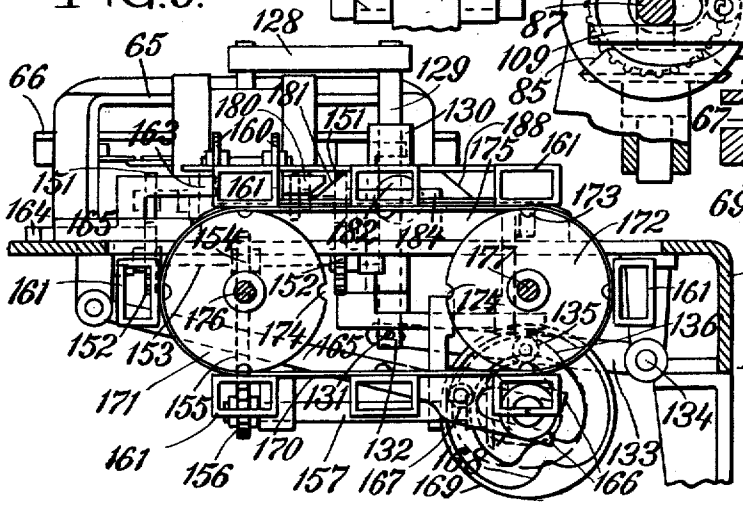


FIG. 9.



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4 SHEETS—SHEET 4.

FIG. 10.

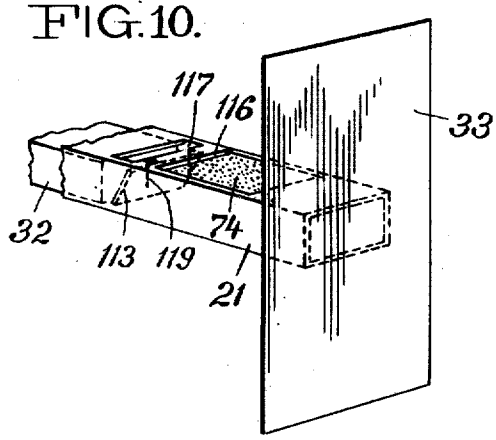


FIG. 11.

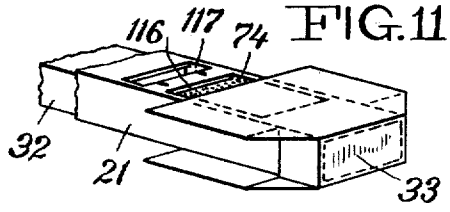


FIG. 12.

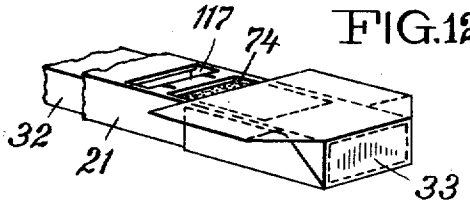


FIG. 13.

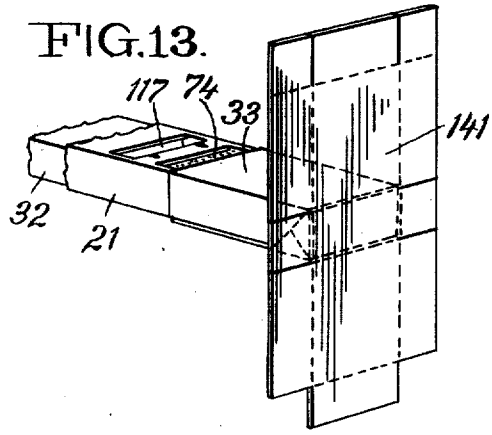


FIG. 14.

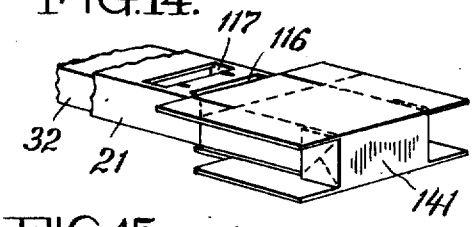


FIG. 15.

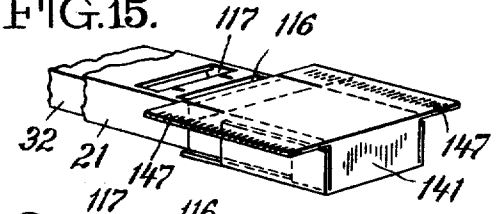


FIG. 16.

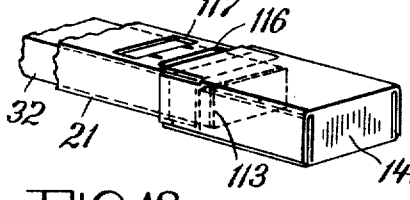


FIG. 17.

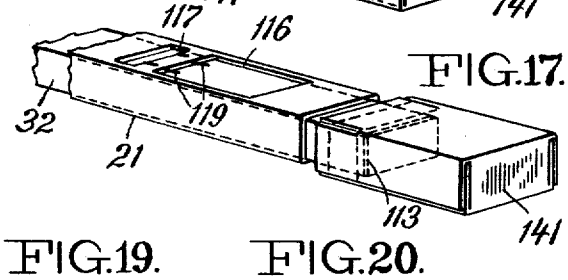


FIG. 18.

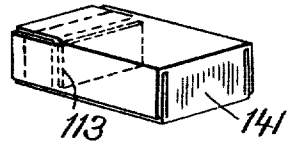


FIG. 19.

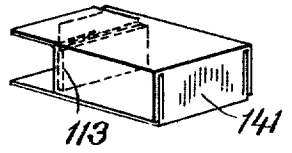


FIG. 20.

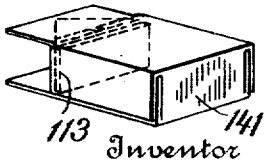


FIG. 21.

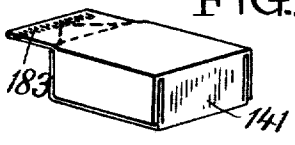
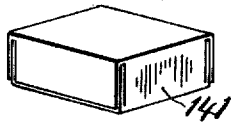


FIG. 22.



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UNITED STATES PATENT OFFICE.

HILARIO DE ESCOBALES, OF NEW YORK, N. Y.

PACKAGING-MACHINE.

1,309,122. Specification of Letters Patent. Patented July 8, 1919.

Application filed August 20, 1917. Serial No. 187,313.

To all whom it may concern:

Be it known that I, HILARIO DE ESCOBALES, a citizen of the Island of Porto Rico, and a resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented a certain new and useful Packaging-Machine, of which the following is a specification.

This invention relates to improvements in packaging machines, pertaining more particularly to machines adapted to automatically form charges of the material to be packaged and packaging this charge by locating it within an inner wrapper and an outer container, the latter being sealed, thereby producing sealed packages of definite content amount from a bulk supply by the operations of the machine.

The present invention includes certain features contained in the structural disclosures of certain companion applications, being varied to a greater or less extent to meet changed conditions caused by the differences in the form of the package. The following are examples.

The machine is particularly applicable for use in the packaging of comminuted materials or such materials as may be varied in shape by pressure action. It is preferred not to attempt to introduce a charge of this kind into a preformed receptacle either of wrapper or container form, and I therefore employ a basic feature of my companion application filed March 22, 1916, Ser. No. 85,875, in that I locate the charge within a carrier which serves as a form in the folding of the wrapper, thus practically building up the wrapper formation about the positioned charge. Certain variations, however, from this general idea are made in the present machine, since the package to be produced differs materially from that produced by the machine of said application.

Another of these differences is the use of an external container in addition to the wrapper, the wrapper and container being formed separately, a general action more particularly disclosed in my companion application filed June 8, 1917, Ser. No. 173,558, differing therefrom, however, in the fact that instead of completely folding the wrapper to produce an embryo package in advance of folding the container, the wrapper is folded with one end open, after which the container is folded to a similar extent—thus leaving the two free from interengagement—and then fold the open ends of both together, thus tending to interengage the closing flap structures. An additional difference is that the present invention provides for folding both wrapper and container during the travel of the charge in a single direction—enabling the charge to be retained in the charge-carrier or form until after the container has been partially folded. In the companion application the movements of the charge are varied in direction in folding the wrapper and the container.

The present invention is designed more particularly to provide a package of the general type referred to, and in which, in addition, I employ a strip or card which is located beneath the closing flaps of the package, this card or strip closely approximating the interior cross-sectional area of the package, thus placing a member or element across the top of the charge, this member serving to decrease liability of sifting of contents from the package.

An additional feature of the present invention is the general correlation of the operating parts and structures for the purpose of producing the package in a simple and efficient manner, the general arrangement being such as to greatly reduce if not entirely eliminate the loss of material through sifting or other action during the packaging operation, even where the material is of a character liable to provide such sifting action under machine operation.

An additional object of the invention is to simplify machines of this general type, to provide machines adapted to operate with comparatively large capacity and in a simple and efficient manner.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of the machine.

Fig. 2 is a longitudinal section on the line II—II of Fig. 1.

Fig. 3 shows the position of parts when comminuted articles are forced into the hollow plunger.

Fig. 4 is a transverse section on the line IV—IV of Fig. 3.

Fig. 5 shows the position of parts when the card is pressed against the comminuted articles.

Fig. 6 shows the position of parts when a wrapper is placed in advance of the plungers.

Fig. 7 is a transverse section on the line VII—VII of Fig. 2.

Fig. 8 is a transverse section of part of the machine, showing the means for feeding and cutting off a card.

Fig. 9 is a transverse section on the line IX—IX of Fig. 2, parts being shown in elevation.

Fig. 10 is a perspective view of the plungers and a wrapper when the card and comminuted articles have been placed in the hollow plunger.

Figs. 11, 12 and 13 show the different folds of the wrapper during travel of the plungers and wrapper through the first wrapper folding channel to a position behind a cardboard wrapper.

Figs. 14, 15 and 16 show the different folds of the cardboard wrapper during travel of the plungers and wrappers through the second wrapper folding channel.

Fig. 17 shows the position of the wrappers and inner plunger when the hollow plunger is moved back away from the articles and wrappers.

Fig. 18 shows the position of the wrappers and the card when both plungers are moved back away therefrom.

Fig. 19 shows the position of the wrappers when the transversely moving plunger folds rear flaps on one side thereof.

Fig. 20 shows the position of the wrappers when the transversely moving receptacle forces the opposite side rear flaps against a stationary side folder.

Fig. 21 shows the lower rear flap folded up by movement of said receptacle past a stationary lower folder.

Fig. 22 shows the upper rear flap folded down by movement of said receptacle past a stationary upper folder.

In producing the package of the present application, one of the main characteristics is the preliminary folding of the wrapper and container with the folding practically controlled by a form of fixed dimensions, thus producing a wrapper and container formation of uniform character in successive packages. Another feature lending itself to the wrapped completion of the packaging operation is the ability to practically begin the closing operations of the package upon the completion of the preliminary folding of the container, this result being had by reason of the fact that the charge which is being packaged is contained within the form and therefore carried with the form during the folding operations, so that the charge is already within the embryo package when the completion of the folding cycle places the partially completed wrapper and container into the closing instrumentality, thus eliminating any material loss of time or handling of the elements of the package preliminary to closing the latter. The underlying or basic feature of the present invention about which the general arrangement of parts reside, is the form which carries the charge during the folding operations, and this form or charge-carrier is in the form of a hollow casing adapted to be reciprocated in the direction of its length and which is adapted to receive a charge while at one extreme of its reciprocation and carry the charge through a succession of folding channels, and introducing into these channels and into the path of travel of this carrier, the wrapper and the container in blank form, the movement of the carrier or form through the channels causing these blanks to be successively folded on the outer face of the carrier. In order that the general operation of the machine may be readily understood, a brief description of the general operation is given preliminary to describing the elements of the machine by means of which this operation is secured.

The charge-carrier or hollow form—which is open at its advance end—receives a charge of a substantially definite amount from a compartment formed in an intermittently rotated dial carrying a plurality of these compartments. Each compartment is provided with a bottom which, in the present instance, is on the order of a slidable trap-door or valve which is normally positioned to close the bottom of the compartment but which, when a compartment is located in vertical registration with a receiving opening in the top of the charge-carrier or form, is shifted to open this particular compartment, allowing the charge to fall into the interior of the charge carrier or be pushed thereinto by means of a vertically reciprocating plunger.

An empty compartment receives its charge at a different station of the dial. At this receiving station, a hopper is located for receiving the material in bulk, and whenever a compartment is located beneath it, an amount of material is fed into the compartment by suitable means, shown herein as in the form of a spiral structure which tends to force the material into the compartment. The bottom of the hopper is substantially flush with the top of the dial, so that as the dial is moved to carry the compartment from beneath the hopper, a suitable cut-off action is provided to segregate the charge from the bulk.

The opening of the charge-carrier through which the charge is received, is preferably spaced from the advance end of the form or

carrier, thus introducing the charge into a space of greater length than the length of the compartment. To provide against the escape of the charge through the open advance end, the wrapper blank—which is freely introduced to position in advance of the first folding channel—is moved into contact with the open end of the carrier and held there during entrance of the charge, thus preventing movement of the charge through the open end.

The opposite end of the charge-receiving portion of this form is closed normally by the advance end of an inner plunger, and further closed by a strip or card which is introduced into the interior of the carrier in advance of the inner plunger prior to or at the time when the charge is being introduced. It may be noted that this strip or card is the strip which underlies the closing flaps of the completed package heretofore referred to.

This strip or card is obtained from a suitable source, indicated in the present instance as the result of severing a strip having a width equal to the length of the card to be inserted; this severed card being introduced into a supplemental opening in the dial at a station in advance of the charge-delivery station, the positioned card traveling with the dial to the charge-delivery station and there passing through a supplemental opening at the top of the form or carrier into the interior of the latter in advance of the inner plunger and in rear of a suitable holding device which normally extends downward from the interior of the form to act as a support for and retain the card in an upright position, this holding device, however, being yieldable to permit the card to pass outward under the action of the inner plunger during a subsequent part of the operation. This positioning of the charge and the card takes place while the charge carrier is in its rear position, Fig. 10 indicating diagrammatically the charge carrier and its contained charge, the positioned card, and the advance open end of the carrier closed by the wrapper. In this view, the form or charge carrier is indicated at 21, the inner plunger at 32, the wrapper at 33, the charge at 74, the opening for the reception of the charge at 116, the opening for receiving the card at 117, the supporting member for the card at 119, and the card at 113.

After this positioning of charge 74 and card 113 has taken place—wrapper 33 having been inserted at the entrance to the series of folding channels and in the path of travel of the form or charge carrier, and the container blank, shown at 141 in Fig. 13, having been positioned between successive folding channels—advance of the form or charge carrier first carries the wrapper 33 into the first folding channel, the charge 74 and card 113 moving with the form, plunger 32 and the form moving in unison at this time. The initial action of this advancing movement is to fold the wrapper to the forms shown successively in Figs. 11, 12 and 13, these folding operations being provided by folders of simple and well-known form. This folding of the wrapper provides a cup-like wrapping, closed at the advance end of the form by the portion of the wrapper which overlies such end, the opposite end of the cup being open. The advancing form and the cup-shaped wrapper thereon then encounter container blank 141 as shown in Fig. 13, the advance end of the form—closed by the bottom of the cup—contacting with a proper point on the container blank.

The form then enters the second folding channel carrying the container blank into the channel and first giving the folding action indicated in Fig. 14, this being followed by the turning up of the lower side flaps as in Fig. 15, the application of adhesive to the under face of the upper side flaps, after which these latter flaps are folded down against the outer sides of the up-turned flaps, the container side flaps thus becoming adhesively connected without, however, providing any adhesive connection between the inner wrapper, now in cup shape, and the container which is also in cup shape, as indicated in Fig. 16. The elements of the embryo package at this time are the charge within form 21, and the nested cup-shaped wrapper and container, the card 113 still being supported in position.

At the completion of the container cup, the charge carrier or form and the cups located thereon are introduced into an open-ended receptacle having an internal configuration adapted to readily receive the cups, one end of the receptacle being closed at this time, this receptacle being adapted to act as an internal form during the succeeding operation.

This completes the length of advance reciprocation of the form or carrier, and while in this position or slightly prior to reaching this position, the inner plunger 32 is advanced relative to this form, thus shaping and, if desired, compressing the charge within the carrier or form and placing card 113 in proper position, this card practically forming the advance end of plunger 32 during the shaping action. During this shaping or compressing action, the charge carrier or form is withdrawn, the charge being held from reverse movement by the pressure of plunger 32, the shaped form of the charge causing it to occupy the space within the composite cup left by the receding form.

This position is shown in Fig. 17 and following this, plunger 32 is also withdrawn from the cups and both plunger and form return to their initial positions, leaving the

two open ended cups within the receptacle and the charge maintained in position by card 113.

The receptacle is adapted to be moved transversely from this receiving position, but in advance of movement to carry the embryo package from this position, a reciprocating folding finger is made active in connection with one of the end laps of the composite container, this finger turning in this end lap and the corresponding portion of the inner wrapper cup, thus producing the configuration of Fig. 19 and forming a stop to prevent movement of card 113 out of position. The receptacle then begins its movement in a transverse direction which brings the opposite end laps into contact with a stationary folder, thus turning in the opposite end lap, after which the advance of this receptacle in this direction successively turns up one end flap, applies adhesive to the under face of the other end flap, and finally turns down the upper end flap and adhesively connects these end flaps, thus completing the package, the package being moved out of the receptacle by a suitable plunger at one of the receptacle stations, the folding and adhesive-applying being by mechanisms located at proper points in the path of advancing movement of the receptacle.

The various mechanisms and instrumentalities employed for carrying out this general operation will now be described in detail. It may be noted that the charge, card 113, and wrapper and container blanks are positioned while the hollow form or charge carrier is in its rear position, the form and inner plunger advancing in substantial unison by approximately continuous movement until the formed cups are located in the receptacle at the opposite end of the reciprocation of the carrier, after which the plungers return to position, the folding of the first end flap taking place in immediate succession to the movement of plunger 32 from its advance position in order to retain the more or less shaped or compressed condition of the charge and prevent escape of the card and charge. Hence the capacity of the machine is practically controlled by the length of time required to complete the cycle of movements of the form, the latter moving simply in one direction to provide the cup-shaped elements, these latter being formed with little or no contact with the charge—it being understood, of course, that the charge will remain in the position it occupies when first introduced into the carrier, there being no movement of plunger 32 or card 113 to disturb this initial positioning of the charge until the relative movement is had after the charge carrier has entered the receptacle, and the form for the cups is shifted from that provided by the charge carrier (an internal form for the cups) to that provided by the walls of the receptacle which produce an external form for the cups.

Journaled in bearings forming part of the main frame 1, is a shaft 2 which may be driven by a belt riding over the pulleys 3. Secured to shaft 2 is a gear wheel 4 in mesh with a larger gear wheel 5, which is secured to the main shaft 6. Secured to shaft 6 is a bevel gear wheel 7, in mesh with a bevel gear 8, which is secured to a transverse shaft 9.

To shaft 9 is secured a cam 10, having a groove 11, which engages a roller 12, journaled on one end of a lever 13, which is pivoted on a shaft 14. The other end of lever 13 is connected by a link 15 to a lever 16, which is pivoted at 17 to a stationary support 18 located considerable distance below the frame 1 of the machine. The free end of lever 16 is connected by a link 19 to an arm 20 extending downward from one end of a hollow plunger 21, which is free to reciprocate in a guide 22. Hollow plunger 21 functions as the carrier for the charge during the wrapping operations as well as a form about which the wrapping takes place, and may therefore be considered as a charge-carrier or form. Secured to shaft 9 is a cam 23 having a groove 24, which engages a roller 25 journaled on one end of a lever 26, which is pivoted on the shaft 14. The other end of lever 26 is connected by a link 27 to a lever 28, which is pivoted at 29 to the stationary support 18. The free end of lever 28 is connected by a link 30 to an arm 31 extending downward from one end of a plunger 32, which is free to reciprocate within the hollow plunger 21. The inner plunger extends forward within the hollow plunger so that a cavity of limited length is left between the forward end of the inner plunger and the forward end of the hollow plunger when the plungers reach the end of a return movement, as shown in Figs. 2, 3 and 6. The forward end of the hollow plunger is open, as shown in Fig. 6, and a paper wrapper 33 is then placed on a support 34, forming part of a chute 35 located between the plunger and the upper and lower plates 36 of a wrapper folding channel, thus locating the wrapper blank in advance of the channel. Mounted on the plates 36, is a reciprocating frame 37, having a roller 38 journaled on the upper side thereof, and a roller 39 journaled on the lower side. The frame 37 is provided with a pin 40, engaging a slot 41 formed in an arm 42, secured to a shaft 43. Secured to shaft 43 is an arm 44 provided with a roller 45 adapted for engagement with a cam surface 46 forming part of a cam 47, which is secured to the main shaft 6. The roller 45 is held against the cam surface 46 by means of a spring 48 connected to arm 42. Action of cam sur-

face 46 causes movement of frame 37 and rollers 38 from the position shown in Fig. 6 to the position shown in Fig. 2, whereby the wrapper 33 is moved over against and thereby closes the open end of the hollow plunger, as shown in Figs. 1, 2 and 3.

By this arrangement the wrapper may be freely moved to position within the chute and then moved, at the desired time (controlled by the movement of frame 37), to its position with respect to the open end of charge-carrier 21. The presence of rolls 38 is also of advantage in that they provide surfaces adapted to facilitate the folding movement of the wrapper as the plunger advances into folding channel 36.

Secured to the shaft 6 is a bevel gear wheel 49 in mesh with a bevel gear wheel 50, which is secured to a vertical shaft 51. Secured to vertical shaft 51 is a disk 52 provided with a pin 53 adapted for engagement with radial slots 54 formed in a wheel 55 which is secured to a vertical shaft 56. Disk 52 is provided with a concentric surface 57 adapted for engagement with concave surfaces 58 formed on the periphery of the slotted wheel 55, for the purpose of holding the slotted wheel stationary after the pin 53 of disk 52 has caused rotary movement thereof, as in the operation of a "Geneva" movement. To the upper end of vertical shaft 56 is secured a gear wheel 59 in mesh with a gear wheel 60, which is secured to a short shaft 61 journaled in a bearing 62. In mesh with gear wheel 60 is a gear wheel 63 which is secured to a short shaft 64 journaled in a frame 65. Also secured to shaft 64 is a dial plate 66, provided with a series of compartments 67, which extend through from the upper to the lower side thereof. The compartments 67 are closed by a bottom 68, which is free to slide in guides 69 forming part of the dial plate 66. Each of the bottoms 68 is provided with an opening 70 which is held out of register with the compartments 67 by means of a spring 71 which moves the sliding bottom until checked by a stop thereon.

The mechanism for giving the dial its intermittent rotating motion is somewhat similar to that disclosed in application Ser. No. 173,558.

Located above one of the compartments of said dial plate, when it comes to rest after an intermittent rotary movement caused by the "Geneva" movement described, is the outlet 72 of a hopper 73, in which finely comminuted articles 74 may be placed. The lower end of the outlet 72 of the hopper fits flush with the upper side of the dial plate 66. Within the hopper, and forming part of a central vertical shaft 75, is a screw 76 which extends nearly to the wall of the hopper. To the upper end of the shaft 75 is secured a bevel gear wheel 77, in mesh with a bevel gear wheel 78, which is secured to a shaft 79. To one end of shaft 79 is a bevel gear wheel 80 in mesh with a bevel gear wheel 81 which is secured to the upper end of the vertical shaft 51. It will be evident that rotation of shaft 51 causes rotation of the vertical shaft 75 having the screw threads 76, and thereby causes the comminuted articles 74 to be forced into one of the compartments 67.

To the other end of shaft 79 is secured a bevel gear wheel 82 in mesh with a bevel gear wheel 83 which is secured to a vertical shaft 84. Secured to vertical shaft 84 is a bevel gear wheel 85 in mesh with a bevel gear wheel 86 which is secured to a horizontal shaft 87. To shaft 87 is secured a wheel 88 having gear teeth 89 extending through one fourth of its circumference and a concentric surface 90 extending through three fourths. Concentric surface 90 engages any one of four concave surfaces 91 which are formed at equal distances apart on the periphery of a wheel 92 journaled on a stationary shaft 93. Located between the concave surfaces 91 on the periphery of wheel 92, are gear teeth 94 adapted for engagement with the gear teeth 89 of wheel 88. Forming part of wheel 92 is a chain wheel 95 engaging a chain 96 which rides over a chain wheel 97 secured to a shaft 98. To shaft 98 is secured a roller 99. Also secured to shaft 98 is a gear wheel 100 in mesh with a gear wheel 101 which is secured to a shaft 102. To shaft 102 is secured a roller 103. Extending downward between the rollers 99 and 103 is a strip of cardboard which is fed from a roll mounted on a shaft 104. It will be evident that during three fourths of a revolution of the wheel 88, the rollers 99 and 103 will remain stationary, and that during one fourth of a revolution of said wheel the teeth 89 thereon will cause one fourth of a revolution of the wheel 92, and consequently cause one fourth of a revolution of the rollers 99 and 103, thereby causing a short downward movement of the strip of cardboard. The cardboard passes down between a stationary knife 105 and a knife 106 attached to a slide 107 having reciprocating movement in guides 108. Slide 107 is provided with arms 109 which straddle the shaft 87. Secured to shaft 87 is a cam 110 having a cam groove 111, which engages a roller 112 journaled on slide 107, thereby causing movement of the slide and attached knife 106, so that the portion of the cardboard extending below the knives 106 and 105 will be cut off. The card 113 that is thus cut off, falls into one of a series of openings 114 that are formed in the dial plate 66 adjacent to the compartments 67. The card 113 then rests on a stationary support 115, as shown in Fig. 8.

An intermittent rotary movement of the dial 66 in the direction indicated by the arrow in Fig. 1, then causes the compartment

67 and the opening 114 of the dial to be moved to rest in register with corresponding openings 116 and 117 that are formed in the hollow plunger 21, opening 116 being located spaced from the open end of the plunger. During this movement of the dial, the card travels on the support 115 until it reaches an opening 118 therein that registers with the opening 117, at which time the card falls into the hollow plunger to rest in advance of the inner plunger 32, as shown in Fig. 2. The card is held up by the weight of downwardly extending arms 119, which are pivoted at 120 to the upper side of the hollow plunger.

Each of the sliding bottoms 68 is provided with an upwardly extending pin 121 which, during the intermittent rotary movement of the dial 66, is free to move past the free end of an arm 122 that is secured to a vertical shaft 123. Secured to shaft 123 is an arm 124 provided with a roller 125 adapted for engagement with a cam groove 126 formed in the cam 47. Action of cam groove 126 causes movement of arm 122 against the pin 121 of the sliding bottom 68 of the compartment 67 that registers with the opening 116 of the hollow plunger, see Fig. 1, thereby causing movement of said bottom so that the opening 70 thereof is moved over to register with the compartment 67. Located above said compartment 67 is a vertically reciprocating plunger 127 forming part of an arm 128 which is secured to a rod 129 having vertical reciprocating movement in a guide 130. The lower end of rod 129 is provided with a pin 131 engaging a slot 132 formed in the free end of a lever 133 which is pivoted at 134. Journaled on lever 133 is a roller 135 adapted for engagement with a cam groove 136 formed in a cam 137, which is secured to the main shaft 6. Action of cam groove 136 causes downward movement of plunger 127, thereby causing the comminuted articles to be forced down out of compartment 67 into the hollow plunger, as shown in Fig. 3. It will be seen that the comminuted articles then rest in advance of the card 113 and are prevented from falling out of the hollow plunger by means of the paper wrapper 33 which is held against the open end thereof by means of rollers 38, 39 on sliding frame 37.

Action of cams 10 and 23 causes the hollow plunger and the inner plunger to be moved forward simultaneously, thereby causing the wrapper 33 to be folded upon the exterior of the hollow plunger, in the manner shown by Fig. 11, by means of the upper and lower plates 36 and the inwardly extending side projections 138. Forward movement of the hollow plunger causes lower side flaps of the wrapper to be folded up, as shown in Fig. 12, by means of the stationary folder 139, and cause upper side flaps to be folded down, as shown in Fig. 13, by means of the stationary folder 140, thus forming a cup-like receptacle on the external faces of the hollow plunger, the latter acting as the form for the folding operation. A cardboard wrapper 141 is placed on a support 142 in a chute 143, and during forward movement of the hollow plunger and partially folded wrapper 33, the cardboard wrapper 141 is thereby folded upon the exterior of the wrapper 33, in the manner shown by Fig. 14, by means of upper and lower plates 144 and inwardly extending side projections 145. Forward movement of the hollow plunger causes lower side flaps of the cardboard wrapper to be folded up, as shown in Fig. 15, by means of the wheel folders 146, and causes adhesive 147 to be applied to the under side of the upper side flaps of the cardboard wrapper, by means of revolving wheels 148 which carry adhesive up from a receptacle 149. Each wheel 148 is secured to a shaft 150, to which a gear wheel 151 is secured. Each gear wheel 151 is in mesh with a gear wheel 152, which is secured to a shaft 153. Secured to shaft 153 is a chain wheel 154 in engagement with a chain 155 which rides over a chain wheel 156 secured to a shaft 157. To shaft 157 is secured a bevel gear wheel 158 in mesh with a bevel gear wheel 159 which is secured to the main shaft 6, whereby revolving motion is imparted, through the mechanism described, to the adhesive applying wheels 148. Forward movement of the hollow plunger causes the adhesive coated upper side flaps of the cardboard wrapper to be folded down against the folded lower side flaps thereof, as shown in Fig. 16, by means of the wheel folders 160.

The hollow plunger, at the end of its forward movement, carries the wrappers and contained articles into a receptacle 161 and against an abutment 162, as shown in Fig. 5. At the same time, the inner plunger is advanced within the hollow plunger, which causes the card 113 to be advanced, thereby causing the arms 119 to swing up on their pivots 120, and causing the charge to be pressed within the hollow plunger and against the wrappers (the cup-shaped wrapper and container) resting against the abutment 162. The card 113 and the inner plunger then occupy the position shown in Figs. 5 and 16.

The part *a* of cam groove 24 of the cam 23, then causes the inner plunger to remain stationary, while the hollow plunger is moved back, as shown in Fig. 17, by means of the part *b* of the cam groove 11 of the cam 10. Both plungers are then moved back, so that the card 113 and overhanging rear flaps of the wrappers occupy the position shown in Fig. 18.

A plunger or folding finger 163, forming part of a slide 164, having reciprocating movement in guides 165, then folds a rear side flap of the cardboard container and of the paper wrapper, from the position shown in Fig. 18 to the position shown in Fig. 19. Connected to slide 164 is a bar 165, having arms 166 which straddle the main shaft 6. Journaled on bar 165 is a roller 167 engaging a groove 168 formed in a cam wheel 169 which is secured to the shaft 6.

Groove 168 is of a form which will permit finger 163 to begin its inward movement as soon as the movement of plunger 32 will permit, so as to retain the shaped or more or less compressed condition of the charge. The return movement of the finger may take place at any time prior to the arrival of the succeeding embryo package, the movement of the receptacle in the direction to fold the opposite side lap being away from this finger. The arrangement thus permits the finger to retain the card in its position until the end closing action is advanced to a point where liability of card shifting is eliminated.

Receptacle 161 is one of a series which are secured to a endless band 170 riding over wheels 171 and 172 and provided with teeth 173 adapted for engagement with notches 174 formed in said wheels. The upper run of said receptacles moves transversely to the line of travel of the hollow and inner plungers and slides on rails 175. Wheel 171 is secured to a short shaft 176, and wheel 172 is secured to one end of a shaft 177. To the other end of shaft 177 is secured a bevel gear wheel 178, in mesh with a bevel gear wheel 179 which is secured to the intermittently moving vertical shaft 56. Intermittent movements are accordingly imparted to the series of receptaces 161. The receptacle 161 having the wrappers folded as shown in Fig. 19, when moved by the intermittent mechanism, causes the opposite side rear flap of the wrappers to be forced against an inwardly extending side projection 180, thereby causing said flap of the wrappers to be folded to the position shown in Fig. 20. Movement of said receptacle causes the lower rear flap to be forced against a folder 181, which causes the flap to be folded to the position shown in Fig. 21. Movement of said receptacle causes the upper rear flap to be moved over a revolving wheel 182, which carries adhesive 183 thereto from a receptacle 184. Wheel 182 is secured to a shaft 185 to which is secured a bevel gear wheel 186 in mesh with a gear wheel 187 which is secured to revolving shaft 150. Movement of said receptacle causes the adhesive coated upper rear flap to be forced against a folder 188, which causes the flap to be folded down against the lower rear flap, as shown in Fig. 22. Movement of said receptacle also causes the finished package shown in Fig. 22, to be moved into alinement with a plunger 189 having reciprocating movement in guides 190 in a direction transverse to the line of travel of said receptacles. Plunger 189 is connected by a link 191 to an arm 192, which is secured to a shaft 193. To shaft 193 is secured an arm 194 provided with a roller 195 adapted for engagement with a cam groove 196 which is formed in cam 47. Action of cam groove 196 causes movement of plunger 189 whereby the finished package is forced out of said receptacle 161.

As will be seen, the card and the charge are introduced into the charge carrier before the latter begins its advance movement, the arrangement of the parts being such that this positioning takes place substantially concurrently. Hence, the contents of the nested wrapper and container are all assembled in their approximately relative positions prior to location within this composite wrapping structure; in actual fact, the particular embodiment of the invention disclosed provides this assembly in advance of the formation of the members of this composite container. By this general arrangement, not only is this assembly completed in advance of such location within the container, but the card itself may function as a part of plunger 32 during the shaping operation of the charge, thus enabling the position of the card within the package to be practically provided during this charge-positioning action, and enabling it to act as a folding face during the end closing operations.

As will be seen, opening 116 is spaced from the open end of the carrier and card 113 is spaced some distance in rear of said opening. This position of the card, together with the closing of the open end of the carrier by the wrapper provides a charge-receiving space of greater length than the length of the opening, affording a space within which the charge can be readily located without providing any material pressure either on the wrapper or on the card. This completion of the charge-receiving space is, as heretofore pointed out, had prior to the advancing movement of the carrier, and since the end-closing action of the wrapper is not disturbed by the folding action, and plunger 32 moves in unison with hollow plunger 21, this condition of the charge will be maintained throughout the travel of the carrier into receptacle 161 where the relative movements of the two plungers takes place and the charge and card are positioned within the composite container formed by the movements of the carrier or form.

As will be seen, the folding of the inner element or structure of the composite container into its cup-shaped formation is practically completed prior to reaching the blank for the outer container element or structure,

the latter then being folded. The folded inner wrapper thus functions as a part of the form during the folding of the outer container structure. As a result, the inner wrapper is folded on lines determined by the external faces of the hollow plunger, thus giving the interior of the composite container a definite formation, after which the folding of the outer container on to the inner wrapper not only causes a nested relation between the two structures in their cup-shaped formations, but, in addition, tends to cause a more or less accurate fit of the inner container within the outer container. This result is had without any interengagement of the two structures either in folding or by adhesive, and at the same time tends to provide a resistance factor against separation of the two parts. When, however, the charge and card have been positioned, the end closing operation provides a practical interengagement of these structures or elements through the successive folding operations and the fact that the open ends of both wrapper and container are being manipulated concurrently.

While this concurrent folding takes place on the open ends of both structures, the effect of the folding differs somewhat, due to the difference in shape of the blanks. This will be understood from an inspection of Figs. 18 to 20. The inner wrapper end is substantially continuous in contour, while the outer container is slitted. Hence, when the first lap is folded, the infolding of the inner container tends to produce a bellows fold effect which gives the upper and lower walls of the inner container a configuration somewhat as shown in Fig. 19, while the upper and lower flaps of the outer container retain their initial angular form. Folding of the opposite lap produces a similar effect at the opposite side, so that when both laps are folded—the position of Fig. 20—the inner container unfolded flaps are approximately triangular in form. Hence, the under surface of the outer end flap of the container is practically free to receive its adhesive, and by means of which the adhesive connection is practically made between the container flap and underlying flap, it being understood that the adhesive applied is in the form of a strip (Fig. 21) so that little, if any, adhesive is applied on to the inner wrapper.

Having thus described my invention, what I claim is:

1. A packaging machine, comprising a hollow reciprocating plunger having an open end; wrapper folding means located in advance of said plunger; means whereby a wrapper may be forced against the open end of said plunger; a reciprocating plunger within said hollow plunger; means whereby a card may be placed in said hollow plunger and in advance of the inner plunger; means whereby comminuted articles can be forced into said hollow plunger and between said card and said wrapper; means for actuating said plungers, whereby forward movement of said hollow plunger through said wrapper folding means causes a wrapper to be folded upon the exterior of said hollow plunger, and whereby forward movement of said inner plunger and consequent forward movement of said card causes said articles to be compressed and said plunger actuating means causing said plungers to be moved back away from said card and said articles and inclosing wrapper.

2. A packaging machine, comprising a hollow reciprocating plunger having an open end; wrapper folding means located in advance of said plunger; means whereby a wrapper may be forced against the open end of said plunger in advance of plunger-advancement movement; a reciprocating plunger within said hollow plunger; means whereby comminuted articles can be forced into said hollow plunger and in advance of said inner plunger; means for actuating said plungers; whereby forward movement of said hollow plunger through said wrapper folding means causes a wrapper to be folded upon the exterior of said hollow plunger, and whereby forward movement of said inner plunger causes said articles to be compressed and said plunger actuating means causing said plungers to be moved back away from said articles and inclosing wrapper.

3. A packaging machine, comprising a hollow reciprocating plunger having an open end; wrapper folding means located in advance of said plunger; means whereby a wrapper may be forced against the open end of said plunger; a reciprocating plunger within said hollow plunger; means whereby a card may be placed in said hollow plunger and in advance of the inner plunger; means whereby comminuted articles can be forced into said hollow plunger and between said card and said wrapper; means for actuating said plungers, whereby forward movement of said hollow plunger through said wrapper folding means causes said wrapper to be folded upon the exterior of said hollow plunger, and whereby forward movement of said inner plunger and consequent forward movement of said card causes said articles to be compressed; said plunger actuating means causing said hollow plunger to be moved back away from said card and said articles and inclosing wrapper previous to the time said inner plunger is moved back; and wrapper folding devices and means for actuating them, whereby certain overhanging rear flaps are folded against said card resting against said compressed articles.

4. A packaging machine, comprising a

hollow reciprocating plunger and a reciprocating plunger therein; means whereby a card may be placed in said hollow plunger and in advance of the inner plunger; means whereby comminuted articles can be forced into said hollow plunger and in advance of said card; a wrapper folding channel; means for actuating said plungers, whereby forward movement thereof through said wrapper folding channel causes a wrapper to be folded upon the exterior of said hollow plunger; a second wrapper folding channel; means whereby a cardboard wrapper may be placed between the first and second wrapper folding channel; forward movement of said plunger through the second wrapper folding channel then causing said cardboard wrapper to be folded upon the first named wrapper; said plunger actuating means causing further forward movement of the inner plunger and consequent forward movement of said card, thereby causing said articles to be compressed; and said plunger actuating means then causing said plungers to be moved back away from said card and said articles and inclosing wrappers; and wrapper folding devices and means for actuating them, whereby certain overhanging rear flaps of said two wrappers are folded against said card resting against said compressed articles.

5. A packaging machine, comprising a hollow reciprocating plunger and a reciprocating plunger therein; means whereby a card may be placed in said hollow plunger and in advance of the inner plunger; means whereby comminuted articles can be forced into said hollow plunger and in advance of said card; wrapper folding means; means for actuating said plungers, whereby forward movement of said hollow plunger through said wrapper folding means causes a wrapper to be folded upon the exterior of said hollow plunger, and whereby forward movement of said inner plunger and consequent forward movement of said card causes said articles to be compressed; said plunger actuating means causing said plungers to be moved back away from said card and said articles and inclosing wrapper.

6. A packaging machine, comprising a hollow reciprocating plunger and a reciprocating plunger therein; means whereby a card may be placed in said hollow plunger and in advance of the inner plunger; means whereby comminuted articles can be forced into said hollow plunger and in advance of said card; wrapper folding means; means for actuating said plungers, whereby forward movement of said hollow plunger through said wrapper folding means causes a wrapper to be folded upon the exterior of said hollow plunger, and whereby forward movement of said inner plunger and consequent forward movement of said card causes said articles to be compressed; said plunger actuating means causing said plungers to be moved back away from said card and said articles and inclosing wrapper; and wrapper folding devices and means for actuating them, whereby certain overhanging rear flaps are folded against said card resting against said compressed articles.

7. A packaging machine, comprising an intermittently rotating dial having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; means whereby comminuted articles can be placed in said compartments; a hollow reciprocating plunger and a reciprocating plunger therein, said hollow plunger having an open end and being provided with an opening on its upper side adapted to register with one of said compartments of said table; means for actuating the sliding bottom of the compartment in register with said opening of said hollow plunger, whereby the bottom of said compartment is opened; means whereby said comminuted articles can be forced from said compartment into said hollow plunger and in advance of said inner plunger; wrapper folding means located in advance of said plungers; means whereby a wrapper may be forced against the open end of said hollow plunger; and means for actuating said plungers, whereby forward movement thereof through said wrapper folding means causes said wrapper to be folded upon the exterior of said plungers and causes said contained articles to be compressed; and whereby said plungers can be moved back away from said articles and inclosing wrapper.

8. A packaging machine, comprising an intermittently rotating dial having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; said intermittently rotating dial having a series of openings located adjacent to said series of compartments; means whereby comminuted articles may be forced into certain of said compartments, and means whereby a card may be fed into certain of said openings; a stationary support for said card; a hollow reciprocating plunger and a reciprocating plunger therein, said hollow plunger having openings adapted to register with one of said compartments and one of said openings in said dial; said support for said card having an opening adapted to register with the opening in said plunger registering with said opening in said dial, whereby said card is permitted to fall into said hollow plunger and in advance of said inner plunger; means for actuating the movable bottom of the compartment in register with said opening of said hollow plunger, whereby the bottom of said com-

partment is opened; means whereby said comminuted articles can be forced from said compartment into said hollow plunger and in advance of said card; wrapper folding means; means for actuating said plungers, whereby forward movement thereof through said wrapper folding means causes said wrapper to be folded upon the exterior of said plungers and causes said contained articles to be compressed; and whereby said plungers can be moved back away from said card, and said articles and inclosing wrapper.

9. In a packaging machine, an intermittently rotating dial having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; material-feeding mechanism located above one of said compartments of said dial; said mechanism consisting of a stationary hopper for the material, and a revolving screw, adapted to force said articles down into said compartment; the lower end of said hopper fitting even with the upper end of said compartment, so that rotary movement of the dial causes a regulated amount of said comminuted articles to remain in said compartment to form a charge; a reciprocating hollow form adapted to support a charge during wrapping operations; means for actuating the movable bottom of said compartment at the end of an intermittent rotary movement of said dial and when said compartment is over said form, whereby the bottom of said compartment is opened; and means whereby said charge is forced out of said compartment into said form.

10. In a packaging machine, an intermittently rotating dial, having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; material-feeding mechanism located above one of said compartments, said mechanism consisting of a stationary hopper for comminuted articles, and a revolving screw adapted to force said articles down into said compartment; said intermittently rotating dial having a series of openings located adjacent to said series of compartments and coöperating with the hopper to produce a charge; mechanism located above one of said openings, for feeding and cutting off a card from a strip of cardboard so that it will fall into said opening; a stationary support for said card; a hollow reciprocating plunger constituting a charge-carrying form and having a reciprocating plunger therein, said hollow plunger having openings adapted to register with one of said compartments and one of said openings in said dial at the end of an intermittent rotary movement of said dial; said support for said card having an opening adapted to register with the opening in said plunger registering with said opening in said dial, whereby said card is permitted to fall into said hollow plunger and in advance of said inner plunger; means for actuating the movable bottom of said compartment, whereby the bottom of said compartment is opened; means whereby the charge can be forced from said compartment into said hollow plunger and in advance of said card; and means for actuating said plungers, to locate the charge and card in relative position within a wrapper.

11. In a packaging machine, an intermittently rotating dial having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; charge delivery mechanism located above one of said compartments, said mechanism consisting of a stationary hopper for comminuted articles and a revolving screw adapted to force said articles down into said compartment, said dial coöperating with the hopper to segregate the charge; said intermittently rotating dial having a series of openings located adjacent to said series of compartments; mechanism located above one of said openings for feeding and cutting off a card from a strip of cardboard so that the card will fall into said opening; a reciprocating hollow form adapted to support a charge during wrapping operations; a stationary support for said card, said support having an opening adapted to register with an opening in said dial at the end of an intermittent rotary movement thereof and with said form in the charge-receiving position of the latter, whereby said card is permitted to fall away from said dial and be deposited in the form; means for actuating the movable bottom of the compartment carrying the charge to be delivered to the form, whereby the bottom of said compartment is opened; and means whereby the charge is forced out of said compartment into said form.

12. A packaging machine, comprising an intermittently rotating dial having a series of compartments open at their upper ends, the lower end of each of said compartments being closed by a movable bottom; means whereby comminuted articles may be forced into certain of said compartments to produce a charge; said intermittently rotating dial having a series of openings located adjacent to said series of compartments; mechanism located above one of said openings, for feeding and cutting off a card from a strip of cardboard so that it will fall into said opening; a reciprocating hollow form adapted to support a charge during wrapping operations; a stationary support for said card, said support having an opening adapted to register with an opening in said dial at the end of an intermittent rotary movement thereof and with said form in the

charge-receiving position of the latter, whereby said card is permitted to fall away from said dial and be deposited in the form; means for actuating the movable bottom of the compartment carrying the charge to be delivered to the form, whereby the bottom of said compartment is opened; and means whereby the charge is forced out of said compartment into said form.

13. A packaging machine comprising a wrapper folding channel; an open ended hollow plunger and an inner plunger, said plungers having reciprocating movement through said wrapper folding channel; said hollow plunger having an opening on one side thereof in advance of the forward end of said inner plunger; intermittently moving mechanism including an intermittently moving band provided with a series of receptacles which moves transversely to the line of travel of said plungers, and arranged so that one of said receptacles comes to rest in range with said wrapper folding channel; and an intermittently rotating dial actuated by said mechanism, and provided with a series of charge-carrying compartments, one of said compartments coming to rest in range with said opening of said hollow plunger; means whereby said charge may be forced into said hollow plunger; means whereby a wrapper may be forced against the open end of said hollow plunger, and means for actuating said plungers, whereby forward movement thereof through said wrapper folding channel causes said wrapper to be folded upon the exterior of said plunger; further forward movement of said plungers causing said charge and wrapper to be forced into said receptacle; further forward movement of said inner plunger then causing said charge to be compressed; and said plunger actuating means then causing said plungers to be moved back away from said charge and inclosing wrapper.

14. A packaging machine comprising a wrapper folding channel; an open ended hollow plunger and an inner plunger, said plungers having reciprocating movement through said wrapper folding channel; said hollow plunger having an opening on one side thereof in advance of the forward end of said inner plunger; intermittently moving mechanism including an intermittently moving band provided with a series of receptacles which move transversely to the line of travel of said plungers, and arranged so that one of said receptacles comes to rest in range with said wrapper folding channel; and an intermittently rotating dial actuated by said mechanism, and provided with a series of charge-carrying compartments, one of said compartments coming to rest in range with said opening of said hollow plunger; means whereby said charge may be forced into said hollow plunger; means whereby a wrapper may be forced against the open end of said hollow plunger, and means for actuating said plungers, whereby forward movement thereof through said wrapper folding channel causes said wrapper to be folded upon the exterior of said plunger; further forward movement of said plungers causing said charge and wrapper to be forced into said receptacle; further forward movement of said inner plunger then causing said charge to be compressed; and said plunger actuating means then causing said plungers to be moved back away from said charge and inclosing wrapper; automatic mechanism adapted to fold an overhanging rear flap against said compressed charge, together with stationary folders coöperating with said intermittently moving receptacles, whereby certain other overhanging rear flaps are folded; and means whereby said charge and folded wrapper are moved out of said receptacle.

15. In packaging machines, a reciprocating charge-carrier, means for locating two embryo containers successively on said carrier with its contained charge during its advancing movement to provide a nested relation between the containers, a movable receptacle positionable to receive the containers and the charge, and means for closing the containers concurrently to complete the package.

16. In packaging machines, a reciprocating charge-carrier, means for locating two embryo containers successively on said carrier with its contained charge during its advancing movement to provide a nested relation between the containers, a movable receptacle positionable to receive the containers and the charge, and means for closing the containers concurrently while carried by said receptacle.

17. In packaging machines, a reciprocating charge-carrier, means for folding two container blanks successively into cup-shaped containers on said carrier with its contained charge during its advancing movement to provide a nested relation between the containers, a movable receptacle positionable to receive the containers and the charge, and means for closing the containers concurrently to complete the package.

18. In packaging machines, a reciprocating hollow form adapted to constitute a charge-carrier, folding channels located successively in the travel path of the form, means for supporting a blank at the entrance to each of said channels, whereby movement of the form will cause successive foldings of the blanks into nested relation to produce a composite container structure.

19. In packaging machines, a reciprocating hollow form adapted to constitute a

charge-carrier, folding channels located successively in the travel path of the form, means for supporting a blank at the entrance to each of said channels, whereby movement of the form will cause successive foldings of the blanks into nested relation to produce a composite container structure, each channel being active to produce a cup-shaped container structure.

20. In packaging machines, a reciprocating hollow form adapted to constitute a charge-carrier, folding channels located successively in the travel path of the form, means for supporting a blank at the entrance to each of said channels, whereby movement of the form will cause successive foldings of the blanks into nested relation to produce a composite container structure, each channel being active to produce a cup-shaped container structure, completion of folding of the first blank locating it as a form element in the folding of the succeeding blank.

21. In packaging machines adapted to package a charge and in which the charge is located within nested wrapping elements, a reciprocating form, a pair of folding channels located successively in the travel path of the form, blank-positioning means in advance of each of said channels, whereby movements of said form through said channels will fold each wrapper individually with the first folded blank in nested relation to the second folded blank, and means for introducing a charge into the first folded blank.

22. In packaging machines adapted to package a charge and in which the charge is located within nested wrapping elements, a reciprocating form, a pair of folding channels located successively in the travel path of the form, means for supporting a blank at the entrance to each channel, the first channel having a formation to fold the first blank into cup-shaped formation about said form in advance of form movement into contact with the second blank, whereby the first folded blank will serve as a form in the folding of the second blank, and means for introducing a charge into the first folded blank.

23. In packaging machines adapted to package a charge and in which the charge is located within nested wrapping elements, a hollow reciprocating form constituting a charge-carrier, a pair of folding channels located successively in the travel path of the form, bank-supporting means at the entrance to each of said channels, and means for introducing a charge into said carrier in advance of form movement into the first folding channel.

24. In packaging machines adapted to package a charge and in which the charge is located within nested wrapping elements, a hollow reciprocating form constituting a charge-carrier, a pair of folding channels located successively in the travel path of the form, blank-supporting means at the entrance to each of said channels, and means for introducing a charge into said carrier in advance of form movement into the first folding channel, said folding channels having configurations to permit the first folded blank to serve as a form during folding of the second blank.

25. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a reciprocating charge-carrier, mechanism including the carrier for locating a charge within its container by carrier movements and with the container in cup-shaped formation, means for locating the card relative to the charge in said carrier and in advance of mechanism operation, and means for closing the open end of the container.

26. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier, means for delivering a charge and its card thereto in predetermined relation, and means for locating the positioned charge and card within a charge-container and for closing a container end on the positioned charge and card.

27. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier, means for delivering a charge and its card thereto in predetermined relation, means for moving said carrier, means for locating an open ended container about the positioned charge and card by movements of the carrier, and means for closing the open end of the container.

28. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier adapted to be reciprocated intermittently, means for delivering a charge and its card thereto in predetermined relation during carrier dwell, means for locating an open ended container about the positioned charge and card by movement of the carrier, and means for closing the open end of the container.

29. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier adapted to be reciprocated intermittently, means for delivering a charge and its card thereto in predetermined relation during carrier dwell, means for folding a container into cup-shaped formation about the

positioned charge and card during movements of the carrier, and means for closing the container open end.

30. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier adapted to be reciprocated intermittently, means for delivering a charge and its card thereto in predetermined relation during carrier dwell, means for folding a container into cup-shaped formation about the positioned charge and card during movements of the carrier, and means for folding the open end of the container to close the package.

31. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier adapted to be reciprocated intermittently, a folding channel through which the carrier is movable, a wrapper positionable in the travel path of the carrier and adapted to be folded into cup-shaped formation by the carrier travel, means for delivering a charge and its card to the carrier in advance of wrapper folding, and means for closing the open end of the wrapper.

32. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a charge carrier adapted to be reciprocated intermittently, a folding channel through which the carrier is movable, a wrapper positionable in the travel path of the carrier and adapted to be folded into cup-shaped formation by the carrier travel, means for delivering a charge and its card to the carrier in advance of wrapper folding, said charge and card being movable with the carrier during the wrapper folding operation, and means for closing the open end of the wrapper.

33. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, a reciprocating charge carrier including a hollow form and plunger therein, means for locating a charge and its card in said form in advance of said plunger, means for folding a wrapper about said form and its positioned charge and card by travel movements of the carrier, a receptacle for receiving the form with its folded wrapper and the charge and card, means for providing relative movements between the form, plunger and receptacle to locate the charge and card within the folded wrapper to produce an embryo package, and means for completing the package while within said receptacle.

34. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a charge carrier, and means for locating the charge and card in said carrier substantially concurrently.

35. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating charge carrier having charge and card receiving openings, and means adapted to present a charge and card in position to be entered into said carrier through said openings.

36. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating charge carrier adapted to locate the charge and card in the package formation, said carrier having a charge-receiving and a card-receiving opening relatively positioned to locate the charge in advance of the card within the carrier, and means for presenting a charge and its card in position to be entered into the carrier through said openings.

37. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating hollow charge carrier having charge-receiving and card-receiving openings in its top wall, an intermittently rotatable dial having card-receiving and charge-receiving compartments adapted to be positioned over said carrier openings and means whereby a charge and card carried by the dial are introduced into the carrier through said openings.

38. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating charge carrier adapted to locate the charge and card in the package formation, said carrier having a charge-receiving and a card-receiving opening relatively positioned to locate the charge in advance of the card within the carrier, an intermittently rotatable dial having a plurality of sets of compartments each set comprising a charge-receiving compartment and a card-receiving compartment, each set of compartments being positionable

above the corresponding openings of the carrier, and means whereby a charge and its card may be introduced into the carrier substantially concurrently.

39. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating charge carrier adapted to locate the charge and card in the package formation, said carrier having a charge-receiving and a card-receiving opening relatively positioned to locate the charge in advance of the card within the carrier, an intermittently rotatable dial having a plurality of sets of compartments, each set comprising a charge-receiving compartment and a card-receiving compartment, each set of compartments being positionable above the corresponding openings of the carrier, means whereby a charge and its card may be introduced into the carrier substantially concurrently, and means for locating a charge and its card in their compartments in advance of reaching the delivery station of the charge to the container.

40. In packaging apparatus adapted to package a charge and in which a card is interposed between the charge and a folded end of the package container, means for locating the card in relative position to the charge in advance of charge packaging, said means including a reciprocating charge carrier adapted to locate the charge and card in the package formation, said carrier having a charge-receiving and a card-receiving opening relatively positioned to locate the charge in advance of the card within the carrier, an intermittently rotatable dial having a plurality of sets of compartments, each set comprising a charge-receiving compartment and a card-receiving compartment, each set of compartments being positionable above the corresponding openings of the carrier, means whereby a charge and its card may be introduced into the carrier substantially concurrently, said dial being movable to carry a set of compartments into charge-receiving, card-receiving and charge-delivery stations, and mechanisms operative at the card and charge-receiving stations for supplying said compartments.

41. In packaging machines adapted to package a charge, a form adapted to be reciprocated intermittently and having an open end, a folding channel through which the form is movable, and means for closing said form open end by a positioned wrapper blank in advance of form movement within the folding channel.

42. In packaging machines adapted to package a charge and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, means for locating a charge in said carrier, and means for closing said carrier open end by a positioned wrapper blank in advance of carrier movement within the folding channel.

43. In packaging machines adapted to package a charge, and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, mechanism for closing the carrier open end by a positioned wrapper blank during carrier dwell, and means for locating a charge in said carrier while the carrier open end is closed.

44. In packaging machines adapted to package a charge and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, mechanism for closing the carrier open end by a positioned wrapper blank during carrier dwell, said mechanism including a frame movable relatively to the folding channel to carry the blank into its closing position, and means for locating a charge in said carrier while the carrier open end is closed.

45. In packaging machines adapted to package a charge and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, mechanism for closing the carrier open end by a positioned wrapper blank during carrier dwell, said mechanism including a frame movable relatively to the folding channel to carry the blank into its closing position, said frame carrying rolls located out of the travel path of the carrier, and means for locating a charge in said carrier while the carrier open end is closed.

46. In packaging machines adapted to package a charge and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, mechanism for closing the carrier open end by a positioned wrapper blank during carrier dwell, said mechanism including a frame carried by the folding channel, said frame having rolls located out of the travel path of the carrier, means for reciprocating said frame to place said rolls into and out of contact with a positioned blank, and means for locating a charge in said carrier while the carrier open end is closed.

47. In packaging machines adapted to package a charge and in which the container is produced in the presence of the charge, a charge carrier adapted to be reciprocated intermittently and having an open end, a folding channel through which the carrier is movable, mechanism for closing the carrier open end by a positioned wrapper blank during carrier dwell, said mechanism including a frame movable relatively to the folding channel to carry the blank into its closing position, and means for locating a charge in said carrier while the carrier open end is closed, said frame and carrier being located on opposite sides of the blank travel path during the positioning movement of the blank.

48. In packaging machines adapted to package a charge and in which the charge is located within its container during charge movements, a reciprocating hollow charge-carrier having an open advance end and adapted to carry the charge during charge location within its container, means for closing said open end, means for locating a card in said carrier at a point spaced from said open end, whereby said closing means and said card will complete a charge-receiving space within said carrier, and means for introducing the charge into said space.

49. In packaging machines adapted to package a charge and in which the charge is located within its container during charge movements, a reciprocating hollow charge-carrier having an open advance end and adapted to carry the charge during charge location within its container, means for moving a wrapper blank into closing position relative to said open end, means for locating a card in said carrier at a point spaced from said positioned blank, whereby said blank and card will complete a charge-receiving space within said carrier, and means for introducing the charge into said space.

50. In packaging machines adapted to package a charge and in which the charge is located within its container during charge movements, a reciprocating hollow charge-carrier having an open advance end and adapted to carry the charge during charge location within its container, means for closing said open end, means for locating a card in said carrier at a point spaced from said open end, whereby said closing means and said card will complete a charge-receiving space within said carrier, means for introducing the charge into said space, and means for discharging the charge and card from the carrier into a container, whereby said card will be positioned within the container upon discharging the charge from the carrier.

51. In packaging machines adapted to package a charge and in which the charge is located within its container during charge movements, a reciprocating hollow charge-carrier having an open advance end and adapted to carry the charge during charge location within its container, means for closing said open end, means for locating a card in said carrier at a point spaced from said open end, whereby said closing means and said card will complete a charge-receiving space within said carrier, means for introducing the charge into said space, and means for discharging the charge and card into the container.

52. In packaging machines adapted to package a charge and in which the charge is located within its container during charge movements, a reciprocating hollow charge-carrier having an open advance end and adapted to carry the charge during charge location within its container, means for moving a wrapper blank into closing position relative to said open end, means for locating a card in said carrier at a point spaced from said positioned blank, whereby said blank and card will complete a charge-receiving space within said carrier, and means for introducing the charge into said space, means operated by the movement of said carrier for folding said wrapper into embryo container formation during travel of the carrier, and means for discharging the charge and card into said container.

53. In packaging machines, means for nesting individual inner and outer cup-shaped container structures and for locating a charge therein, and means for completing the package by closing the open ends of said structures concurrently to produce an inter-engagement therebetween.

54. In packaging machines, means for locating a charge in its embryo wrapping container, said container including an inner cup-shaped wrapper and an outer cup-shaped container in nested relation, and means for completing the package by folding corresponding parts of both container structures concurrently to produce an inter-engagement therebetween.

55. In packaging machines, means for folding an inner wrapper blank and an outer container blank into individual cup-shaped structures and for nesting said structures, means for locating a charge in the nested structures, and means for completing the package by concurrently folding flaps of both structures to produce an interengagement therebetween.

56. In packaging machines, a reciprocating form, means for producing a cup-shaped inner wrapper free from adhesive connection and a cup-shaped outer container having adhesively-connected walls during movements of the form, said form movements being adapted to locate said wrapper and container in nested relation, means for locating a charge within the nested structures, and

means for concurrently folding flaps of both structures to interengage them and complete the package.

57. In packaging machines, a reciprocating form, means for producing a cup-shaped inner wrapper free from adhesive connection and a cup-shaped outer container having adhesively-connected walls during movements of the form, said form movements being adapted to locate said wrapper and container in nested relation, means for locating a charge within the nested structures, and means for concurrently folding flaps of both structures to interengage them and complete the package, said latter means including adhesive-applying mechanism operative on the outer container during end closing operations.

58. In packaging machines, a traveling receptacle adapted to receive a pair of nested charge-inclosing elements of cup-shaped formation with a charge therein and a card for retaining the charge in position, means for concurrently folding corresponding flaps of the nested structures over the card while said receptacle is in its receiving position, and means made operative on remaining corresponding parts of said structures by travel of the receptacle for closing said parts in predetermined succession during such receptacle travel.

Signed at New York city, in the county of New York and State of New York, this 18th day of August, A. D. 1917.

HILARIO DE ESCOBALES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."