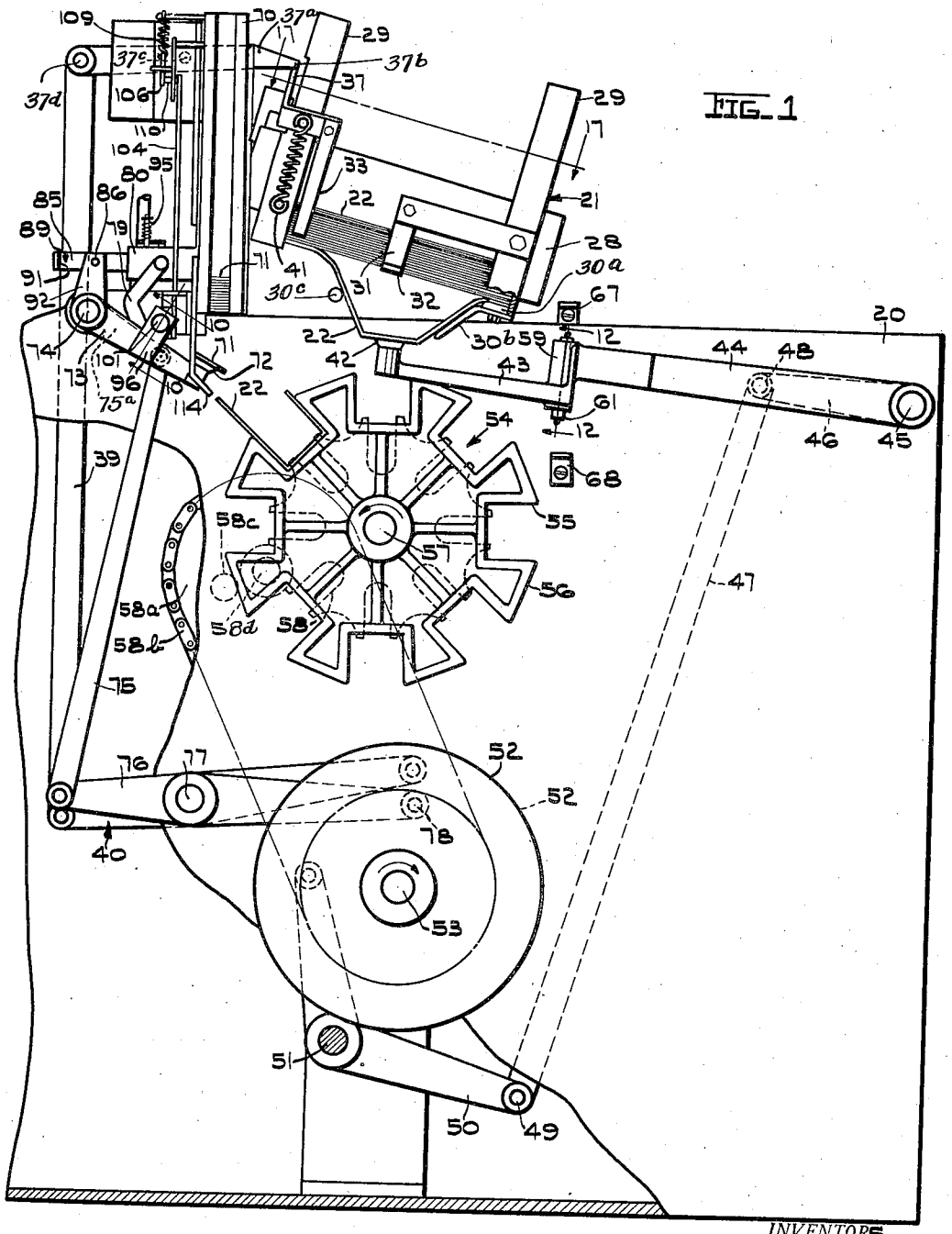
Aug. 29, 1939. M. J. MILMOE ET AL. 2,171,131

CARTON AND ARTICLE FEEDING MECHANISM

Filed June 21, 1937 4 Sheets-Sheet 1

FIG. 1



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CARTON AND ARTICLE FEEDING MECHANISM

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FIG. 2

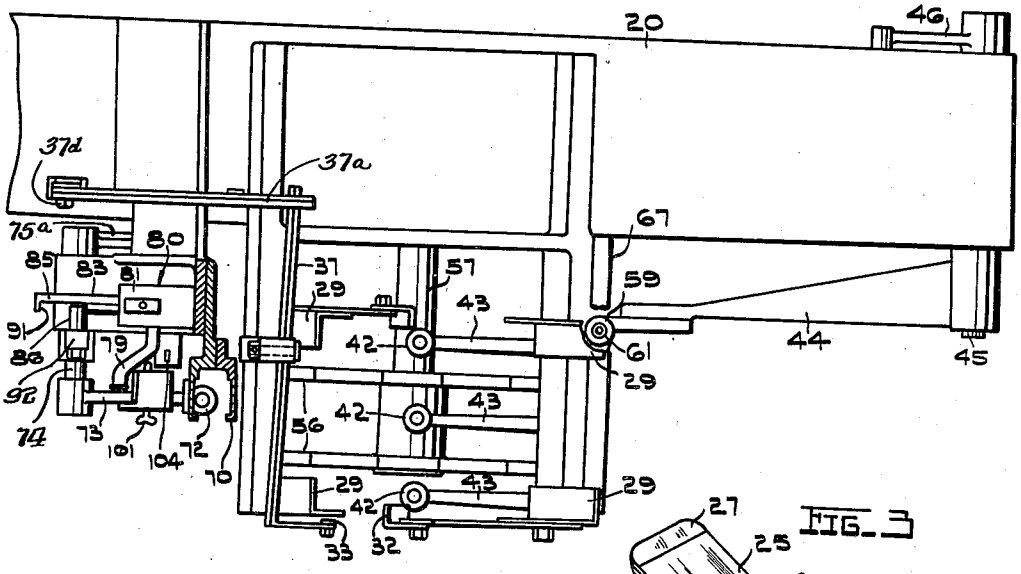


FIG. 3

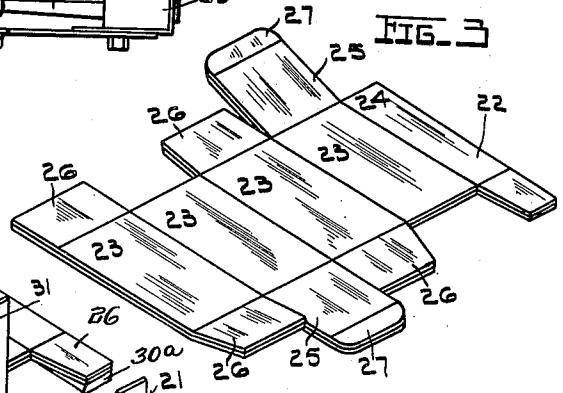


FIG. 4

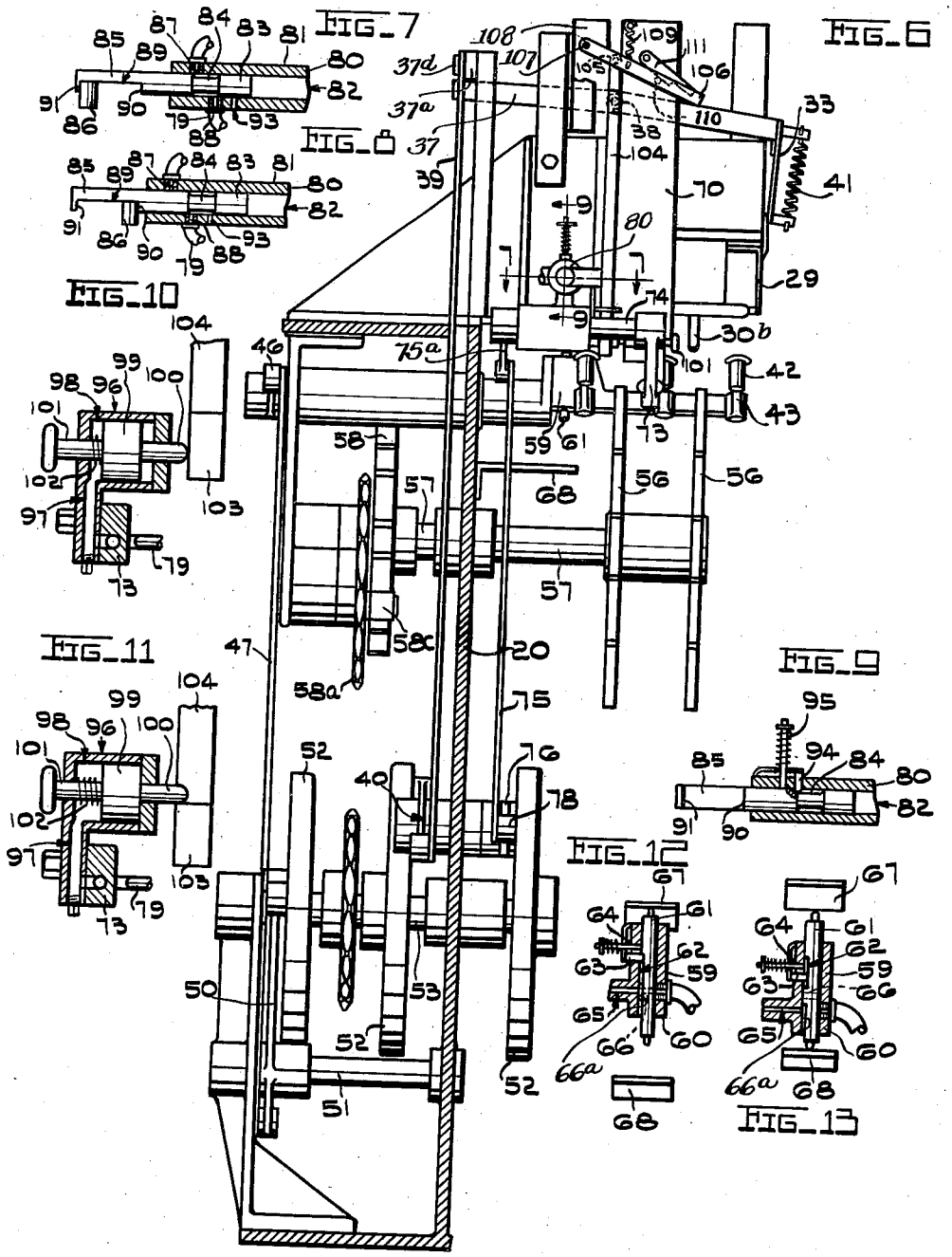
FIG. 5

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CARTON AND ARTICLE FEEDING MECHANISM

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CARTON AND ARTICLE FEEDING MECHANISM

Filed June 21, 1937 4 Sheets-Sheet 4

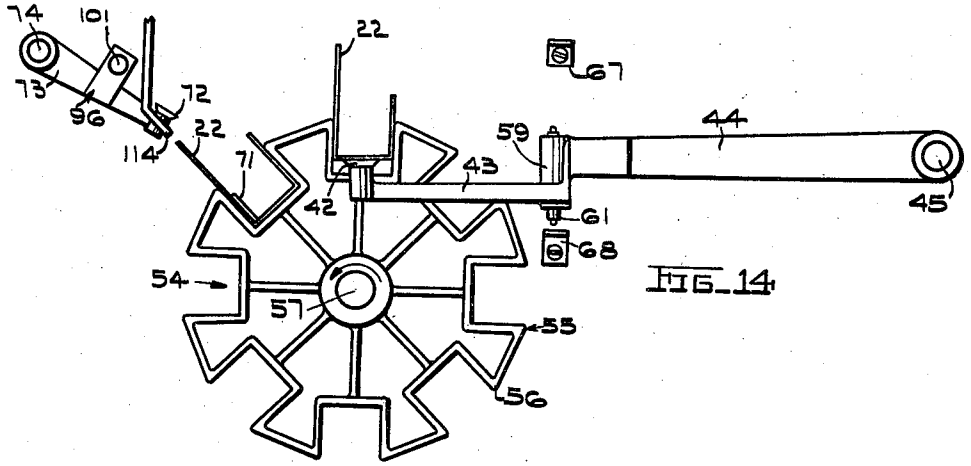


FIG. 14

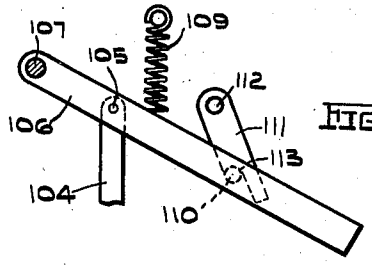


FIG. 15

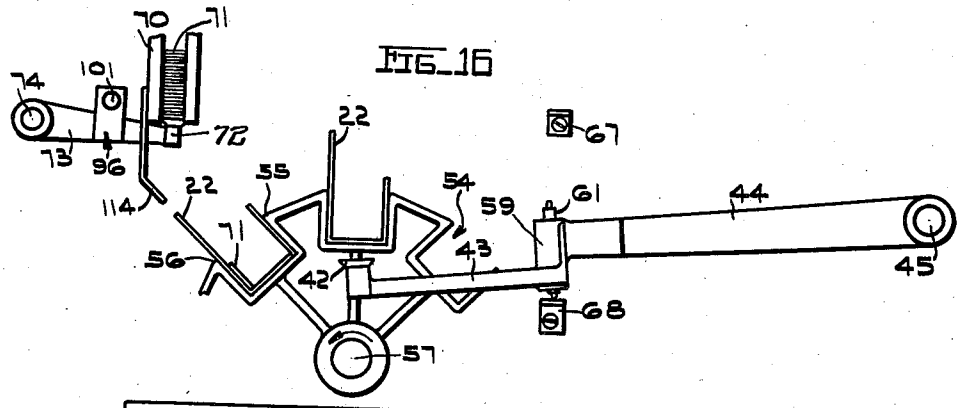


FIG. 16

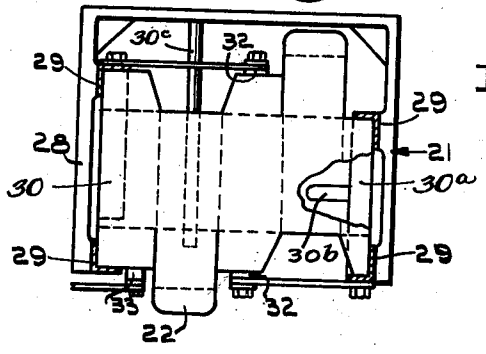


FIG. 17

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Patented Aug. 29, 1939 2,171,131

UNITED STATES PATENT OFFICE

2,171,131

CARTON AND ARTICLE FEEDING MECHANISM

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Application June 21, 1937, Serial No. 149,424

26 Claims. (Cl. 93—3)

This invention relates to wrapping machines, and particularly to machines for packaging butter. More specifically, the invention relates to means for packaging an article such as butter and placing in the package an article to accompany the packaged butter.

The primary object of the invention is to provide feeding mechanism for wrapping or packaging machines whereby carton blanks are positively and effectively fed in a predetermined manner so as to prevent cartons from jamming and sticking together, whereby only one carton at a time will be fed, and whereby new and improved means are provided for removing only one carton at a time from a stack of cartons and placing the fed carton in a particular position and preforming it, and finally arranging an article into the preformed carton prior to the time the article to be packaged is placed in the carton.

Another important object of the invention is the provision of a new and novel detector mechanism whereby a pneumatic article-positioning device will inhibit the operation of the entire machine when an artcle is not in proper position to be fed.

A still further object of the invention resides in the novel combination of the parts and elements arranged to provide and establish a mechanism which will positively operate, which is efficient in operation, and which is not likely to get out of order.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail vertical sectional view of the feeding mechanism which is adapted to be applied to or made a part of a wrapping or packaging machine;

Fig. 2 is a detail top plan view, partly in section, of the mechanism shown in Fig. 1;

Fig. 3 is a detail perspective view of a plurality of blank cartons showing the position the cartons ordinarily assume when they are arranged in the carton magazine;

Fig. 4 is a detail perspective view showing the manner in which the cartons are arranged or positioned immediately prior to being fed, said cartons being shown arranged in feeding position in the carton magazine;

Fig. 5 is a detail view showing a modified form of carton blank feeding and separating mechanism;

Fig. 6 is a detail vertical sectional view of a packaging or wrapping machine and embodying the invention;

Fig. 7 is a detail sectional view of a valve construction controlling the operation of the pneumatic article or envelope-feeding mechanism, said figure being taken on the line 7—7 of Fig. 6, the valve being shown in open position;

Fig. 8 is a view similar to Fig. 7, the valve being shown in closed position;

Fig. 9 is a detail sectional view on the line 9—9 of Fig. 6;

Fig. 10 is a detail sectional view on the line 10—10 of Fig. 1, showing the detector mechanism, the operation of which is controlled by the valve shown in Figs. 7 to 9, the said mechanism being shown in its normal operating position;

Fig. 11 is a detail view similar to Fig. 10, showing the mechanism in its non-operative position to prevent further operation of the machine;

Fig. 12 is a detail vertical sectional view on the line 12—12 of Fig. 1, showing the valve which controls the pneumatic carton feeding mechanism, and showing the valve in open or operating position;

Fig. 13 is a view similar to Fig. 12, but showing the valve in closed or non-operating position;

Fig. 14 is a detail view showing the manner in which the cartons are fed and the manner in which an envelope or other article is positioned into the prior fed carton;

Fig. 15 is a detail elevational view of locking mechanism to control the operation of an electric switch;

Fig. 16 is a view similar to Fig. 14, showing the carton pneumatic or suction mechanism in normal or rest position; and

Fig. 17 is a detail sectional view on the line 17—17 of Fig. 1.

The carton and article feeding mechanism is supported by a suitable supporting structure 20 which may be and preferably is a part of the wrapping machine frame. This supporting structure 20, through suitable supporting members, supports and carries a carton holding member or magazine 21 which supports a plurality of cartons 22.

Each carton 22 (Figs. 3, 4 and 5) is of the conventional form and comprises four side walls 23, a side flap 24, ends 25, and end flaps 26. The ends 25 are provided with the usual tucking flaps 27.

The carton magazine 21 is arranged in an inclined position, as shown in Fig. 1, and comprises a supporting yoke 28, to which upstanding

vertical corner guides 29 are secured (Fig. 17). Carton supporting bars, strips or ledges 30 and 30a (Figs. 1, 4, 5 and 17) are secured, approximate the lower ends of the corner guides 29 to said guides or to the yoke 28 in any desired manner, the ledge 30 extending beneath and supporting the outer side wall 23 and the rear end flap 26 of the carton, and the ledge 30a extending beneath and supporting the side flap 24 and its end flap 26. The inner longitudinal edges of the ledges 30 and 30a are curved to facilitate the downward withdrawal of the bottom carton from the stack of cartons. A carton supporting ledge 30b (Figs. 1, 6 and 17) secured to the ledge 30a extends inwardly and downwardly to support and guide the bottom carton during its discharge from the stack. Downwardly extending carton supporting members 31 (Figs. 1, 4 and 5) have carton engaging fingers 32 (Figs. 1, 4, 5 and 17) which extend beneath the central end flaps 26 to centrally support the stacked cartons in proper position (Figs. 4 and 5). The fingers 32 are inclined downwardly from a point above the bottom carton to cause an initial bending of the end flaps 26 and to facilitate the withdrawal of said carton. Ordinarily the carton blanks, when they are stacked, due to the folding and scoring thereof, assume the position shown in Fig. 3, whereby the end flaps 26 and the end closures 25 extend in various positions, as shown in Fig. 3, causing these portions and the stacked cartons to snag or foul one another as the cartons are removed from the bottom one by one, making it difficult to remove the cartons properly as well as often causing the parts of the carton to become misaligned and sometimes even torn. To overcome the condition previously described regarding the carton shown in Fig. 3, the carton engaging fingers 32 are raised, as stated, a predetermined distance from the normal bottom of the under carton and are adapted to engage the central end flaps 26 tending to raise these flaps about the normal plane of the carton. This arrangement causes the end closures 25 and the flaps 26 on the ends to become disengaged from each other to prevent such fouling of the cartons as they are being removed from the magazine. To assist in preventing the fouling of the cartons as they are being fed, and to properly separate the cartons so that only one at a time will be fed, a movable finger 33 is provided to engage the edges of one of the flaps 26 (Fig. 4) to cause one carton to become separated from its adjacent carton and to prevent the flap 26 from snagging or fouling with an adjacent end closure 25. This finger 33 is provided with a turned portion 34 (Fig. 4) which constantly engages the edges of the carton, the member 33 being constantly moved in a reciprocating manner. If desired, the movable member or finger 33 may be dispensed with and a stationary member 35 (Fig. 5) may be provided. This stationary finger 35 has a carton receiving edge 36 which engages the tucking flap 27 and spaces it or separates it from the adjacent flaps 26. It has been found advantageous, however, to employ the movable finger 33 in connection with the present device although the member 35 has been employed with satisfactory results. This movable member 33 is attached to an arm 37 (Fig. 6) which is suitably pivoted at 38 to a part of the magazine or its frame. The outer end of the arm 37 opposite to that to which the finger 33 is attached (to the left, Fig. 6) is normally urged upward against the under surface of an arm 37a as indicated at 37b (Fig. 1) by means of a spring 41 (Figs. 1 and 6) attached to the inner end of the arm 37 and to a pin carried by the magazine structure. The arms 37a is pivoted intermediately at 37c (Fig. 1) and at its outer end is pivotally connected to a link 39 by a pin 37d (Figs. 1 and 6). The link 39 is operatively connected for reciprocation to suitable mechanism indicated generally by the numeral 40 which may comprise a cam and cam follower. Thus, during vertical reciprocation of the rod 39, the arm 37 is caused to operate on its pivot 38, consequently causing vertical movement of the carton engaging finger 33. With the arrangement shown the finger 33 is given a positive movement in an upward direction as viewed in Fig. 1, but its downward movement is due to the action of the spring 41, thus preventing any injury to the flaps of the cartons.

The means for removing the cartons one by one from the bottom of a stack in the carton holding magazine comprises pneumatic or suction means including a plurality of spaced suction heads 42 which are carried by a yoke or frame 43, Figs. 1, 2 and 16. This suction frame or yoke 43 is operatively secured to a support or bar 44, Figs. 1 and 16, and is adapted to be fixed to a shaft 45 suitably carried by the supporting structure 20. A lever 46 is also rigidly fixed to the shaft 45 and is operated by a link 47, being pivoted thereto as indicated at 48, Fig. 1.

The link 47 is pivoted at 49 to one arm of the bell crank 50 which is pivoted to a part of the frame, as indicated at 51, Fig. 1. The other end of the bell crank 50 comprises a cam follower cooperating with one of the cams 52 which is operated by a shaft 53. The operation of the bell crank 50 by the cam causes vertical movement of the suction yoke or frame 43 to move the suction heads 42 into engagement with the lowermost carton 22 of the stack of cartons in the magazine 21, and move this carton into position into one of a plurality of pockets 54 of the carton receiving member 55, Figs. 1, 14 and 16. A guide pin or rod 30c (Figs. 1 and 17) which is secured to and depends from the magazine 21 a distance beneath the bottom carton, cooperates with the carton supporting ledge 30b in guiding and breaking the carton being removed and in folding the same during such removal, as shown in Fig. 1.

This carton receiving member 55 comprises spaced spider members or wheels 56, each of which is provided with the pockets 54 arranged in alignment, Fig. 6. The carton receiving member 55, which comprises the pocketed spaced wheels 56, is rigidly secured to a shaft 57 (Fig. 1) which is driven by a gear 58 secured to a shaft 58d. The gear 58, which may be a Geneva gear, may be intermittently driven in any suitable manner, but primarily driven from the drive shaft 53, Figs. 1 and 6, by the sprocket 58a, the chain 58b and the Geneva operating pin 58c. Therefore, the carton receiving member 55 will operate synchronously and in timed relationship with the operation and movement of the suction heads 42.

The suction yoke or frame 43 is provided with bores in the arms thereof leading to the suction heads 42 so as to permit or cause suction, as desired. The suction yoke or frame 43 has mounted thereon a suction valve 59, Figs. 1, 12, 13, 14 and 16, to turn on or shut off the suction, as required. This suction valve 59 being rigidly mounted on the suction frame or yoke 43, moves up and down along with the yoke 43 and the connecting arm 44.

This suction valve 59, Figs. 12 and 13, comprises a casing 60 having a bore in which a plunger 61 is slidably mounted. The plunger 61 is provided with a cut-away or notched portion 62 into which a friction member or pin 63 is received to guide the plunger in the casing 60. A spring pressed friction member 64 bears against the outer end of the pin 63 and frictionally retards the plunger, thereby preventing it from operating two freely within the valve casing bore and restraining it against inadvertent movement. The valve casing 60 is also provided with a bore 65 extending therethrough and communicating with the bore in which the plunger 61 operates. This bore 65 has one side thereof connected to a suction source, and its other side connected to the bores or passages in the suction yoke or frame 43 leading to the suction heads 42. The plunger 61, Figs. 12 and 13, is provided with a bore or passage 66 which is adapted to align with the passage or bore 65. The plunger 61, therefore, which has limited movement in the casing, is adapted to close the passage 66 when the plunger is in one position and permit a continuous passage when the plunger is in a position so that the passage 66 aligns with the passage 65. Thus, during vertical movement of the plunger 61 in the casing, suction is permitted or is shut off depending upon the position of the plunger 61. The plunger is operated by upper and lower plunger operating members 67 and 68, respectively (Figs. 12 and 13), which are arranged in fixed position. When the suction frame or yoke 43 is raised to its uppermost position due to the operation of the parts 44—50, the upper end of the plunger 61 will engage the upper plunger operating member 67 and move the plunger so that the bore 66 in the plunger will be in alignment with the transverse bore 65, as shown in Fig. 12, thereby permitting a suction to occur in the suction heads 42. While the suction frame 43 is in its upper most position, the suction heads 42 will engage the lowermost carton of the stack and draw the carton against the suction heads by the suction created therein. As the parts 44–50, inclusive, cause the suction frame 43 to lower, the suction will still be on, as the bores 65 and 66 are in alignment. The suction will continue until the carton has been received within the cooperating pockets 54 at which time the suction heads will near the end of their downward movement. As the suction heads approach the end of their downward movement, the lower end of the plunger 61 will engage the lower plunger operating member 68 and cause the plunger to be moved upwardly in the casing 60, moving the bore 66 out of alignment with the bore 65 and cutting off the suction, as shown in Fig. 13.

The plunger 61 is provided with a vacuum relief port, groove or weep hole 66a which extends axially of the plunger and is placed in communication with the bore 65 of the casing when the plunger is moved upwardly in said casing by the operating member 68, as shown in Fig. 13. In this position the bore 65 and the bores in the suction frames 43 are vented to atmosphere through the port 66a to relieve any residual vacuum in these frames and to permit the carton to be readily released from the suction heads 42.

When the suction has been totally cut off, the carton will be arranged within a pocket 54 and the suction heads will be away from the bottom of the carton, as shown in Fig. 16. The pulling of the carton by the suction heads into the pockets 54 will cause the carton to assume the position shown in Fig. 16 wherein the carton is properly arranged in the cooperating pockets 54 and the suction head is away from the carton. When the suction heads have reached the limit of their downward travel, the carton supporting mechanism 55 will operate in a counter-clockwise direction (Figs. 1, 14 and 16) to bring another pocket 54 into position to receive the next succeeding carton 22.

The invention contemplates the insertion of an article into the carton after the folded cartons are positioned in the carton receiving member 55 and moved to receiving position. The article may comprise an advertising slip or folder, or it may comprise an envelope containing coloring matter where the machine is used for packing oleomargarine and, therefore, the article will be referred to as an envelope. A magazine 70 is arranged in juxtaposition with respect to the carton feeding member 55 and receives a plurality of envelopes 71 (Figs. 1 and 16) whereby the lowermost envelope may be easily removed from the stack of envelopes in the magazine 70 and fed to position with respect to a carton 22 in the carton receiving member 55.

A suction head 72 (Figs. 1, 2, 14 and 16) is carried on a suction arm 73 suitably secured to a shaft 74 (Figs. 1, 2, 6, 14 and 16) journaled in a part of the frame structure. A link 75 (Figs. 1 and 6) is pivotally connected to a lever 75a (Figs. 1, 2 and 6) secured to the other end of the shaft 74 and to an arm 76 which is pivoted at 77. This arm has, at its outer end, a cam follower 78 which is adapted to be operated by another of the cams 52 on the drive shaft 53. Rotation of the drive shaft 53, therefore, causes vertical reciprocation of the suction arm 73, causing the suction head 72 to move toward and away from the lowermost envelope 71 of the stack of envelopes arranged in the magazine 70. The suction arm 73 is provided with a bore or passage therein which leads from the suction head 72 to a conduit 79 (Figs. 1, 2, 7, 8, 9, 10 and 11). The conduit 79 connects the passage in the arm 73 to a valve 80 (Figs. 1, 2, 6, 7, 8 and 9).

The valve 80 comprises an outer casing 81 having a bore 82 provided therein. A plunger or piston 83 is slidably mounted in the casing 81 and has a reduced portion 84. The plunger also has an extension 85 (Figs. 2, 7, 8 and 9) which may be integral with the plunger 83, but which extends outside of the casing 81. This extension is adapted to be operated by a pin 86 (Figs. 1, 2, 7 and 8) to move the reduced portion 84 of the plunger into and out of pneumatic operation with the suction openings 87 and 88 (Figs. 7 and 8). The suction opening 87 leads to a pump or other source of suction supply while the suction opening 88 has operative communication with the conduit 79. Therefore, when the reduced portion 84 of the plunger or piston 83 is in the position shown in Fig. 7, suction is created by forming a continuous passage from the suction opening 87 into the passage surrounding the reduced portion 84 of the piston and into the suction opening 88 leading to the conduit. The passage is then completed through the conduit 79 into the suction arm 73 (Fig. 1) to the suction head.

When the parts are in the position shown in Fig. 7, suction is created in the suction head 72. When the suction valve or piston 83 is moved in the casing 81 to the position shown in Fig. 8, the reduced diameter or portion of the piston is removed from the suction opening 87. Therefore, there will be no suction in the suction head 72.

Whether or not there is suction supplied to the suction head depends upon the position of the piston or plunger 83 with respect to the suction openings 87 and 88. The suction for the suction head 73 is controlled by the pin 86 which operates in the notch 89 provided in the extension 85 (Figs. 7 and 8). This notch 89 formed in the extension 85, provides stop or operating abutments 90 and 91. The pin or finger 86 is carried by a lever 92 secured to the shaft 74 upon which the suction arm 73 (Figs. 1 and 2) is mounted. Therefore, during operation of the suction head 72, the valve 80 will be operated to supply or shut off suction to the suction head 72.

As the arm or link 75 is operated, because of its operation by the cam follower 78, the suction head will be moved into and out of engagement with the lowermost envelope 71. As the suction head 72 moves upwardly into contact with a lowermost envelope 71, the arm 32 (Fig. 1) will move to the left and the pin 86 will engage the operating element 91 thereby moving the piston or plunger 83 to the left (Fig. 7).

When the pin 86 has moved the plunger 83 to the left, as shown in Fig. 7, the suction head 72 will be provided with a suction and cause the lowermost envelope to be sucked by the suction head 72. As the arm 73 moves downwardly, the pin 86 will be moved toward the operating abutment 90 and subsequently cause the plunger to be moved inwardly from the position shown in Fig. 7 to the position shown in Fig. 8, in which latter position the suction will be shut off. Therefore, the suction head 72 is free to move to its lower position before the suction is shut off. Then, when the suction is shut off, the envelope 71 carried by the suction head 72 will be released and dropped by gravity into the open carton 22 in the carton receiving means 55. The delayed operation of the suction valve 83, due to the operation of the pin 86 operating in the notch 89, permits considerable movement of the suction head 72 in a downward direction before suction is shut off as well as considerable movement of the suction head in an upward movement before suction is applied.

The valve 80 may be provided with a weep hole 93 which leads to atmosphere so as to relieve any back pressure or vacuum which may be in the cylinder. The valve 80 may also be provided with a friction pin 94 (Fig. 9) pressed by a spring 95 to permit a slight friction to be exerted on the plunger or piston 83 so as to prevent the piston from operating too freely, or moving axially when it is not intended that the plunger or piston be so moved.

The suction arm 73 carries a detector valve 96 (Figs. 1, 10 and 11) and this valve being connected to the suction arm 73, moves with the suction arm 73. The detector valve 96 (Figs. 10 and 11) has a passage or bore 97 provided therein which leads to the bore or passage formed in the suction arm 73. This passage or bore 97 also leads to, and has communication with, a cylinder chamber 98 in which there is arranged a cylinder or plunger 99 (Figs. 10 and 11).

The cylinder or plunger 99 is provided with stems or extensions 100 and 101 which extend through the opposite end walls of the detector valve casing. A spring 102 is arranged in the detector valve casing and engages the casing and the cylinder or plunger 99 and tends to urge the cylinder or plunger in a predetermined direction (to the right, Figs. 10 and 11). This extension 100 comprises an operating finger which is adapted to engage a stop piece 103 on a link 104 (Figs. 1, 6, 10, 11 and 15).

The link 104 is pivotally connected at 105 to a lever 106 which operates the switch arm 107 (Figs. 6 and 15) of an electric switch 108 (Fig. 6). The electric switch may be any commercial switch, but in the present instance comprises the commercial "General Electric" switch of the type shown in Patent No. 1,728,019. The arm 106 is normally held in its operative position by a spring 109 which has one of its ends attached to a part of the frame or other supporting structure and its other end attached to the arm or lever 106. The operating finger 100 may be released from the lug 103 by pulling outwardly on the knob at the end of the projection or extension 101.

The arm or lever 106 carries a pin 110 (Figs. 1, 6 and 15) which is adapted to cooperate with a pawl or locking member 111, the locking member 111 being pivotally connected at 112 to a part of the machine framework or machine superstructure. Thus, when the arm 106 is pulled downwardly in the position shown in Fig. 15, because of the operation of the link or rod 104, the locking portion 113 of the pawl 111 will engage the pin 110 and hold the rod 104 and the arm 106 in this downward position. When the rod 104 is in the position shown in Fig. 15, the switch operating member 107 has caused the switch to be shut off from a source of electrical supply and, therefore, the entire machine will cease operation.

The stem or operating finger 100 of the detector valve is normally urged to the right (Figs. 10 and 11) by the spring 102. However, inasmuch as this detector valve mechanism is operatively connected with the suction arm 73, the plunger or piston 99 is caused to be operated against the tension of the spring 102 by the suction created in the cylinder 98.

When the suction arm 73 (Fig. 1) moves upwardly to engage a lowermost envelope 71, the valve 80 will be caused to operate, creating a suction through the orifices or openings 87 and 88. This suction then is communicated or transmitted to the chamber 98 because of the passage 97 operatively connected with the suction opening in the arm 73. The suction in the passage 97 will, therefore, cause the piston 99 to be drawn to the left (Fig. 10) and compress the spring, moving the finger or projection 100 away from the lug 103. The valve and the valve finger will be in the position as shown in Fig. 10 when suction is communicated to the passage 97.

The suction is greatest in the passages and chambers at their highest point, which is the chamber 98. When an envelope 71 is engaged by the suction head 72 a vacuum, or considerable suction, is created in the passage 97 and chamber 98 and all this suction is used to operate the piston 99. If, however, there should be no envelope in the magazine 70, then the passage in the suction arm 73 would be open to atmosphere and air would be drawn through the suction arm thereby considerably decreasing the suction in the passage 97 and the chamber 98 to a value insufficient to operate the plunger or piston 99 against the tension of the spring 102. The spring, therefore, would overcome the little amount of suction in the passage 97 and the piston would be moved into the position shown in Fig. 11, whereby the projection or finger 100 would extend above the lug 103. Then, when the suction arm 73 moves downwardly, the finger 100, being in engagement with the lug 103, would cause the link 104 to be moved downwardly, causing the

arm 106 to be moved to the position shown in Fig. 15 at which time the switch 108 would be operated, shutting off the power to the machine. The parts would remain in this latter position because the locking pawl 111 would engage the pin 110. To again start the machine the finger 100 would have to be retracted from the lug 103, and the locking pawl would have to be released. This construction prevents the apparatus from operating when there is no envelope in the envelope magazine 70. When, however, there are envelopes in the magazine 70, a vacuum is caused to occur in the passage 97, which vacuum moves the piston to the position shown in Fig. 10. In this latter position the finger or projection 100 is away from the lug and out of contact therewith wherefore the suction arm is free to operate and no operation of the link 104 occurs. Therefore, the switch mechanism 108 remains in contact permitting the machine to continue operation.

In order to assist the envelopes 71 to be directed into an adjacent carton 22, a guide member 114 (Figs. 1 and 16) is arranged adjacent the suction arm, the bottom or lower edge of this guide member 114 being in alignment with the bottom edge of the carton into which the envelope is to be received (Fig. 1).

Operation

During normal operation of the device, the finger 33 is caused to reciprocate vertically, properly spacing the flaps of the cartons 22 in the carton magazine 21. The carton receiving member 55 is operated intermittently by the Geneva mechanism and the suction head 42 is caused to operate in timed relationship with the intermittent movement of the carton receiving member 55. Therefore, the suction head 42 will engage a lowermost carton and deposit it in the pocket 54. When the suction head has returned to its normal non-engaging or lowered position, as shown in Fig. 15, the Geneva movement will cause the carton receiving member to move in a counterclockwise direction and bring the carton to the position shown in Fig. 1. The suction arm 73 operates in timed relationship with other parts of the machine and causes the lowermost envelope of a stack of envelopes in the magazine 70 to be engaged by the suction head 72. When the suction head 72 returns to its lowermost position, wherein its upper edge is in alignment with the bar 114 and the outwardly extending end portion of the carton 22, the suction to the head 72 will be cut off and the envelope 71 engaged thereby will fall by gravity into the carton 22, being guided by the guide member 114 and the walls of the carton 22.

The operation of the suction arm 73 causes the detector valve mechanism 96 (Figs. 10 and 11) also to operate in timed relationship and normally prevents engagement of the finger 100 with the lug 103. Therefore, the machine is free to continue its operation uninterrupted. If, for any reason, an envelope 71 is not picked up by the suction head 72, or if there are no envelopes 71 in the magazine 70, the detector valve mechanism 96 will not be influenced, as there is no suction, and the valve mechanism will be in the position shown in Fig. 11 whereby the projection or finger 100 will engage the lug 103, pull down the link 104 and shut off the switch mechanism 108.

The invention provides means for holding cartons, properly separating the cartons, and then causing the lowermost carton of a stack to be fed to feeding mechanism by operation of a pneumatic or suction head. The carton is then arranged in a position to receive an envelope after which time the carton, with its envelope, is moved to a predetermined position to receive the article to be packed, such as a block of oleomargarine. Improved means are also provided to prevent operation of the entire machine when no envelope is in proper position in the envelope magazine.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from the magazine, means for shaping the carton blank as it is being placed in the receiving means, means for spacing and separating said blanks while in the magazine, said placing means comprising a suction head, mounted on a reciprocating suction arm, and a valve carried by the suction arm to control the suction to the head.

2. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means comprising a suction head for placing a carton blank in the carton receiving means from the magazine, means for shaping the carton blank as it is being placed in the carton receiving means, means for operating the carton receiving means, article depositing means comprising a second suction head adjacent the shaped carton, and means for operating said article depositing means in timed relation with the operation of the carton receiving means.

3. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from said magazine, means for shaping the carton blank as it is being placed in the carton receiving means, means for operating the carton receiving means, article depositing means adjacent the shaped carton, means for operating said article depositing means in timed relation with the operation of the carton receiving means, said article depositing means including a suction head, an arm for operating the head, and means for reciprocating the arm.

4. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from said magazine, means for shaping the carton blank as it is being placed in the receiving means, article depositing means adjacent the shaped carton, means for operating said article depositing means to place an article into said shaped carton, and means for inhibiting the operation of the carton receiving means, the carton placing means and the article depositing means when no article is present to be operated upon by said depositing means.

5. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from said magazine, means for shaping the carton blank as it is being placed in the receiving means, article depositing means

adjacent the shaped carton, means for operating said article depositing means to place an article into said shaped carton, and means for inhibiting the operation of the carton receiving means, the carton placing means and the article depositing means when no article is present to be operated upon by said depositing means, said article depositing means including a suction head and said inhibiting means including a suction controlled plunger.

6. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means comprising a series of spaced carrier members, means for placing the lowermost carton from said magazine into the carton receiving means, and means for shaping the carton blank as it is placed into the carton receiving means, said placing means comprising a series of spaced gripping devices movable from a position adjacent said magazine to a position between said spaced carrier members.

7. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means, means for placing the lowermost carton from said magazine into the carton receiving means, means for partly folding the carton blank as it is placed into the carton receiving means, a second magazine adapted to receive a plurality of articles to be deposited in the partly folded carton, and means for taking the lowermost article from said stack in the last named magazine and depositing said article into the partly formed carton, and means for inhibiting the action of said placing means when no article is present to be acted upon by said depositing means.

8. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means, means for placing a carton blank from said magazine into the carton receiving means, means for folding the carton blank as it is being placed into the carton receiving means, a second magazine adapted to receive a stack of articles, means for taking a lowermost article from said stack in the last named magazine and depositing said article into the folded carton, and detector mechanism to prevent operation of the carton receiving means, the carton placing means, and the article depositing means when there is no article in the last named magazine.

9. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means, means for placing a carton blank from said magazine into the carton receiving means, means for folding the carton blank as it is being placed into the carton receiving means, a second magazine adapted to receive a stack of articles, means for taking a lowermost article from said stack in the last named magazine and depositing said article into the folded carton, detector mechanism to prevent operation of the carton receiving means, the carton placing means, and the article depositing means when there is no article in the last named magazine, said detector mechanism comprising a movable finger, and means to control the position of the finger.

10. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, and a reciprocating member engaging the stack of blank cartons in the magazine to separate the blanks and keep them from sticking together, said member being spring-urged into carton engaging position, and means for positively moving said member away from the carton against the action of the spring.

11. A packaging machine comprising means for depositing a carton blank into a carton receiving member, means for placing an article in said carton in the member, said last named means comprising a reciprocating arm, pneumatic means carried by the arm, means for reciprocating said arm, means to control the pneumatic means, a piston, suction means for controlling the position of the piston, and means adapted to be operated by said piston for shutting off the operation of the machine.

12. A packaging machine comprising a carton receiving member, a suction head for depositing a carton in the receiving member, an arm carrying said suction head, means for reciprocating said arm, and valve means carried by said arm for controlling the suction to the suction head.

13. A packaging machine comprising means for depositing an article into a carton and comprising a suction head for carrying the article to a predetermined position, a reciprocating arm carrying said suction head, a valve for controlling the suction to said suction head, and means controlled by said reciprocating arm for operating said valve.

14. A packaging machine comprising means for depositing an article into a carton and comprising a suction head for carrying an article to a predetermined position, a reciprocating arm carrying said suction head, a valve for controlling the suction to said suction head, means controlled by said reciprocating arm for operating said valve, an electric switch, means for operating the electric switch, and means controlled by the suction in said suction head for controlling the operation of the last named means.

15. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, a carton receiving member having pockets therein, a suction head adapted to receive a lowermost carton blank from said magazine and deposit said blank into a pocket in the receiving means, means for reciprocating the head, suction control means controlled by the reciprocating means to control the suction head, means for moving the carton receiving means a predetermined distance after a carton is placed in a said pocket, an article receiving magazine adapted to receive a plurality of articles in stacked relationship, a reciprocating suction head adapted to engage and remove the lowermost article from said magazine, means for causing said article to be released from said last named suction head and be deposited in a carton in a pocket of the receiving means, switch means, and switch operating means controlled by said last named suction head for inhibiting the operation of said carton receiving member and both of said suction heads when there is no article in the article magazine.

16. A packaging machine comprising a magazine adapted to hold in superposed relation a plurality of stacked carton blanks of the type having multiple end tabs, means associated with said magazine for holding certain of the tabs in displaced position with respect to other tabs while the cartons are in position within the magazine, and a movable finger engaging at least one tab on a certain carton to displace said tab from a tab on an adjacent carton to prevent said last named tabs from snagging or fouling and preclude interference between the tabs as the car-

tons are withdrawn one by one from the magazine.

17. A packaging machine comprising a magazine adapted to hold in superposed relation a plurality of stacked carton blanks of the type having multiple end tabs, means associated with said magazine for holding certain of the tabs in displaced position with respect to other tabs while the cartons are in position within the magazine, and a movable element engaging the edges of some of the tabs of the cartons positioned in the lower part of the magazine to cause the lower cartons to become separated from adjacent cartons whereby to preclude interference between the tabs as the cartons are withdrawn one by one from the magazine, said holding means comprising an abutment member fixed with respect to the magazine and engageable against the carton tabs.

18. A packaging machine comprising a magazine adapted to hold in superposed relation a plurality of stacked carton blanks of the type having multiple end tabs, means associated with said magazine for holding certain of the tabs in displaced position with respect to other tabs while the cartons are in position within the magazine, whereby to preclude interference between the tabs as the cartons are withdrawn one by one from the magazine, said holding means comprising an abutment member fixed with respect to the magazine and engageable against the carton tabs, a reciprocating member also associated with said magazine and engageable with the side edges of certain of the cartons for separating the cartons, and means for operating said reciprocating member.

19. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means comprising a series of spaced carrier members, reciprocating means engageable with the side edges of some of the cartons to separate a carton from an adjacent carton, means for placing a lowermost carton from said magazine into the carton receiving means, and means for shaping the carton blank as it is placed into the carton receiving means, said placing means comprising a series of spaced suction heads movable from a position adjacent said magazine to a position between said spaced carried members.

20. A packaging machine comprising a carton receiving member, a suction head for depositing a carton in the receiving member, an arm carrying said suction head, means for reciprocating said arm, valve means carried by said arm for controlling the suction to the suction head, and a plurality of fixed abutments engageable by the valve means during the movement of the arm for operating said valve means.

21. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from said magazine, article depositing means adjacent the shaped carton, means for operating said article depositing means to place an article into said shaped carton, and means for inhibiting the operation of the carton placing means when no article is present to be operated upon by said depositing means.

22. A packaging machine comprising a magazine adapted to receive a plurality of stacked carton blanks, means for receiving a carton, means for placing a carton blank in the carton receiving means from said magazine, article depositing means adjacent the shaped carton, means for operating said article depositing means to place an article into said shaped carton, and means for inhibiting the operation of the carton placing means when no article is present to be operated on by said depositing means, said article depositing means including a suction head and said inhibiting means including a suction controlled plunger.

23. A packaging machine comprising a magazine for receiving a plurality of carton blanks in stacked relationship, carton receiving means, means for placing a carton from said magazine into the carton receiving means, means for folding a carton blank into a folded carton, a second magazine adapted to receive a stack of articles, means for taking an article from said stack in the last named magazine and depositing said article into the folded carton, and detector mechanism to prevent operation of the carton placing means when there is no article in the last named magazine.

24. A packaging machine comprising a suction head for depositing an article into a container, control means for controlling the functioning of an operative element of the machine, and means controlled by the suction in said suction head for controlling said control means.

25. A packaging machine comprising a suction head for depositing an article into a container, control means for controlling the functioning of an operative element of the machine, and a piston and cylinder construction controlled by the suction in said suction head for controlling said control means.

26. A packaging machine comprising a suction head for depositing an article into a container, an electric switch for controlling the functioning of an operative element of the machine, and a piston and cylinder construction controlled by the suction in said suction head for controlling said control means.

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