June 26, 1934. B. A. E. JOHNSON 1,964,122

PACKAGING MACHINE

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Fig. 1.

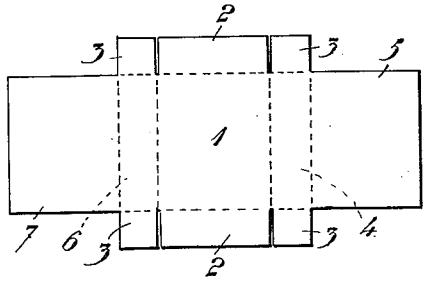


Fig. 2.

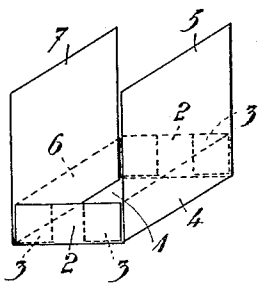


Fig. 15.

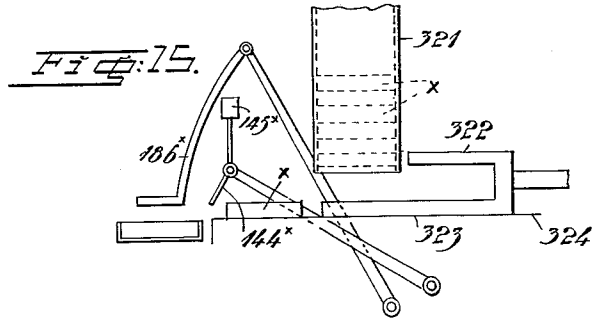
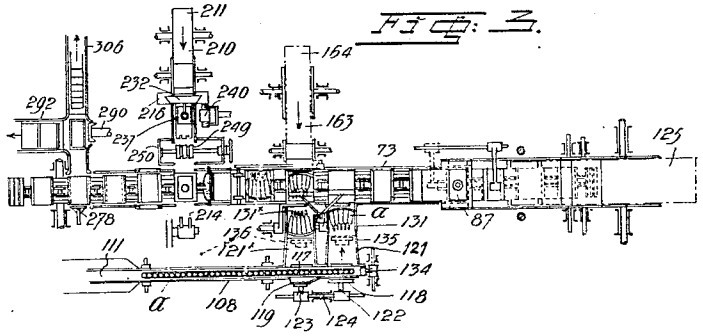


Fig. 3.



B. A. E. Johnson
Inventor

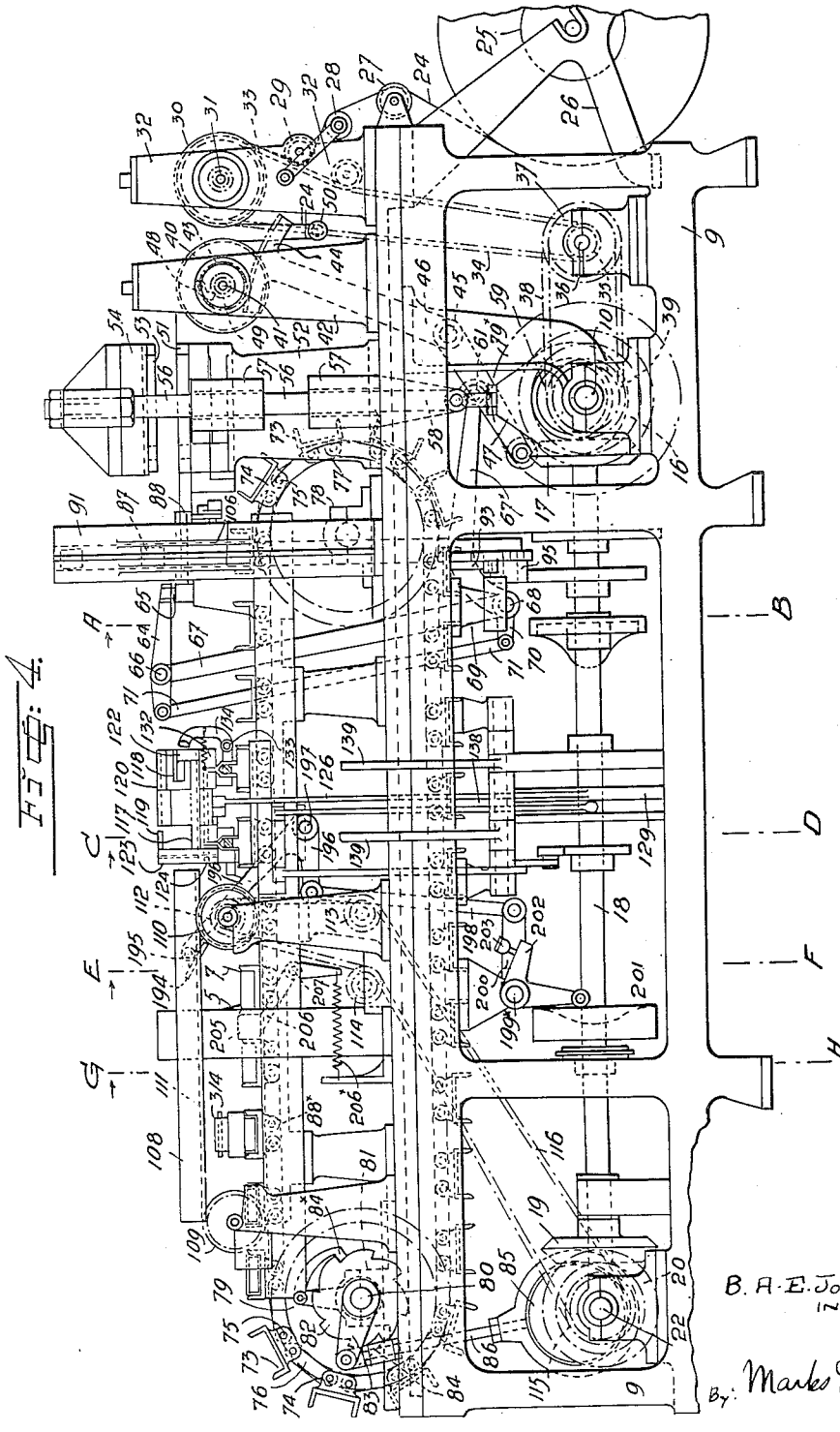
By: Marks & Clerk
Attys.

June 26, 1934. B. A. E. JOHNSON 1,964,122

PACKAGING MACHINE

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FIG. 4.



B. A. E. Johnson
INVENTOR

By: Marks & Clerk
Attys.

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PACKAGING MACHINE

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FIG. 5.

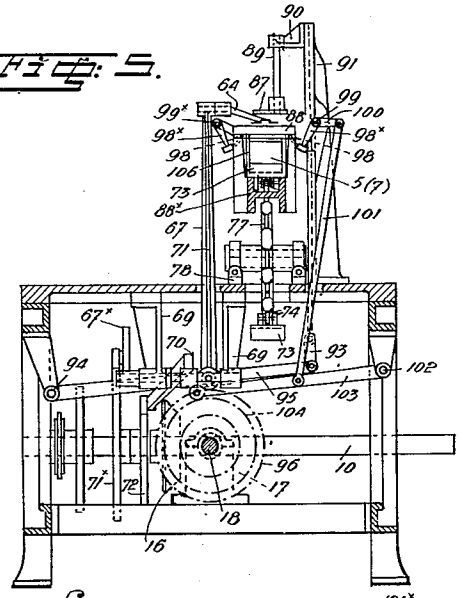
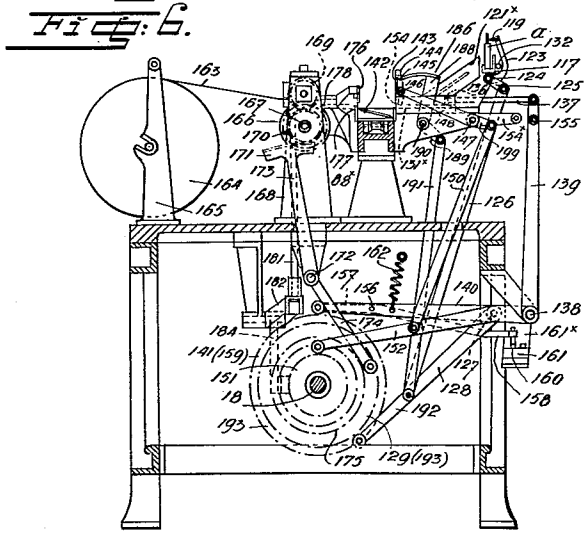


FIG. 6.



B. A. E. Johnson
INVENTOR

By: Marks & Clark
Attys.

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PACKAGING MACHINE

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Fig. 7.

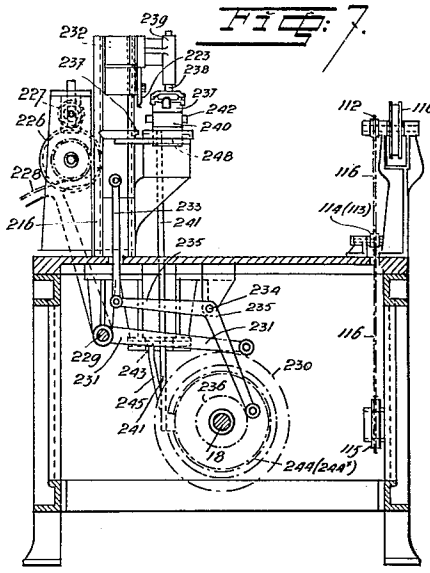


Fig. 12.

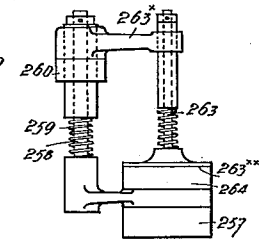


Fig. 13.

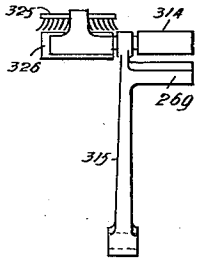
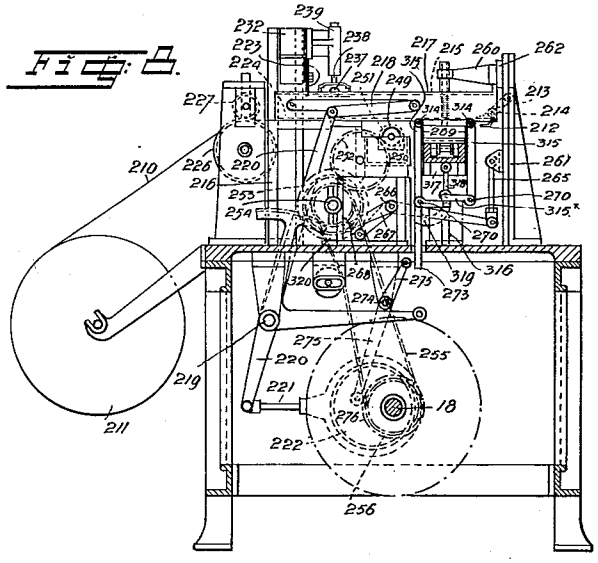


Fig. 8.



B. A. E. Johnson
INVENTOR.

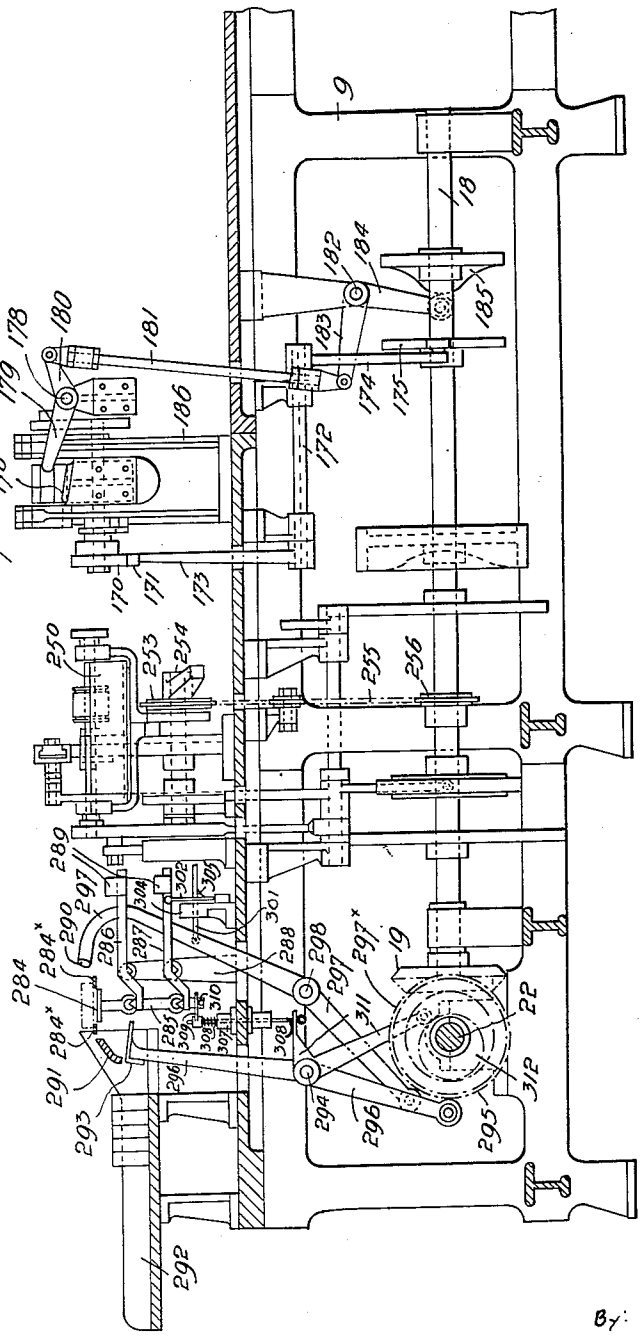
By: Mark Hollan
Atty's.

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PACKAGING MACHINE

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FIG. 4.



B. A. E. Johnson
INVENTOR

By: Marks & Clerk
Attys.

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Fig. 10.

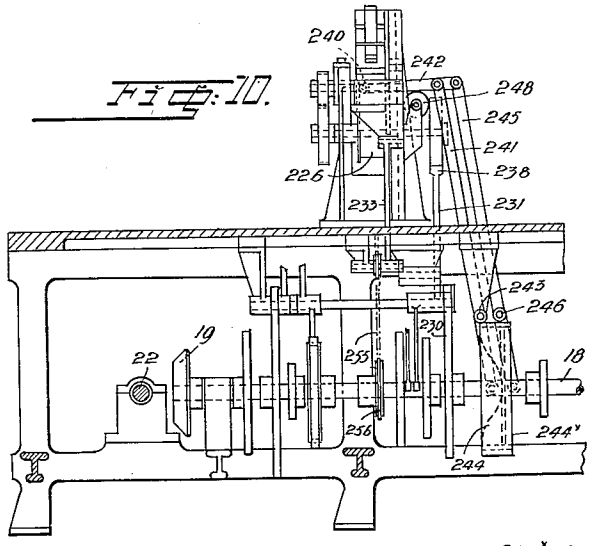


Fig. 14.

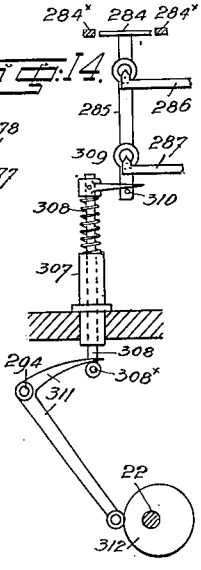
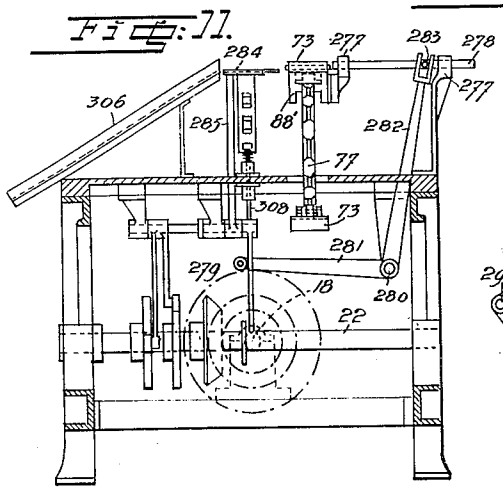


Fig. 11.



B. A. E. Johnson
INVENTOR

By: Mark Allen
Attys

Patented June 26, 1934 1,964,122

UNITED STATES PATENT OFFICE

1,964,122

PACKAGING MACHINE

Bror Anders Emil Johnson, Alsten, Sweden, assignor to Aktiebolaget Gerh. Arehns Mekaniska Verkstad, Stockholm, Sweden, a corporation of Sweden

Application May 9, 1931, Serial No. 536,292
In Germany May 19, 1930

9 Claims. (Cl. 93—6)

This invention relates to machines for packaging articles and goods of different natures. The machine is adapted especially for the packaging of cartridges and bandages. According to a form of execution of the invention blanks for boxes or the like are stamped from a strip of stiff paper or the like, which blanks are then shaped to open boxes by means of a piston, which forces the blank through a device, which together with the piston folds the blank. The piston then moves the box downwards into a compartment placed below the piston, which compartment together with other compartments is moved in an endless path. A part of the said path is substantially straight and at this part the said folding and inserting device and also stations are located for the finishing of the packings. During the movement of the compartments, the boxes are transferred to a station, at which the articles are introduced into the boxes, then to a station, at which the boxes are closed, and then to a station, at which the boxes are sealed. Owing to the fact that the stations thus are located at a straight part of the path of the compartments the operations at all stations easily may be controlled by the person in charge of the machine, which constitutes a guarantee of the machine always delivering correct packings. As an additional control of the operation of the machine the finished boxes may be transferred from the last station to a device, which through weighing controls if the packing is correct or not the controlling device being so arranged, that it separates incorrect packings from correct ones.

The accompanying drawings show as an example a machine for packaging cartridges.

Fig. 1 shows evolved a blank for a boxlike packing,

Fig. 2 shows in a perspective view the blank folded to a box, but the flaps closing the box are not yet turned down;

Fig. 3 is a plan view of the packaging machine; the figure shows the machine diagrammatically.

Fig. 4 is a front view of the machine on a greater scale;

Figs. 5, 6, 7 and 8 are sections on the lines A—B, C—D, E—F and G—H respectively of Fig. 4 and viewed in the directions of the arrows;

Fig. 9 is a front view of a mechanism, which supplies the boxes with an interposed piece of paper, a mechanism providing a sealing strip with a print, and a controlling weighing device together with means for removing the boxes from the same.

Fig. 10 shows the printing device in a front view;

Fig. 11 shows the machine viewed from the left end in Fig. 4, partially in section; Figs. 12 and 13 show details of a mechanism forcing a sealing label or strip against the charged box and smoothing the same;

Fig. 14 is a detail of the controlling and weighing apparatus;

Fig. 15 shows a modified form of execution of the device feeding the articles into the boxes.

The box manufactured in the machine is made from a blank of pasteboard or stiff paper, having the shape shown in Fig. 1. The blank has a part 1 forming the bottom of the box, two end flaps 2, four corner flaps 3, a front side flap 4 from which extends a long flap 5, and a rear side flap 6, from which extends a flap 7. The blank is folded along the dotted lines to a box having the shape shown in Fig. 2. After the goods, for instance the cartridges, have been introduced into the box, the box is closed by turning down first the flap 5 and then the flap 7. On the box thus closed a strip or piece of paper or the like is fixed, which is pasted to the flap 7 and the end flaps 2, whereby the box is perfectly sealed.

9 is the frame of the machine, 10 is the driving shaft of the machine, which in the present case is driven by an electric motor (not shown). Shaft 10 rotates by means of a bevel-gear system 16, 17 a cam shaft 18, which extends longitudinally of the machine and at its one end by means of bevel-gear system 19, 20 rotates a shaft 22, located transversely of the machine.

A strip 24 for instance of paste-board or stiff paper, from which the packings or boxes are manufactured, is wound round a reel 25, journalled in two brackets 26 fixed to the frame 9. The strip 24 passes round guide rollers 27, 28 and 29 to a feed roller 30, the shaft 31 of which is journaled in uprights 32 fixed to the frame. Roller 30 is rotated continuously by means of a sprocket wheel 33, a chain 34 and a sprocket wheel 35 on a shaft 36, which by means of a chain gear 37, 38, 39 is rotated by the shaft 10. The strip 24 passes from the roller 30 to a feed roller 40, which is rotated intermittently and during each movement advances the strip 24 through such a distance as is necessary for the manufacturing of a box. The shaft 41 of the roller 40 is journaled in uprights 42 and is rotated by a toothed wheel 43, which is freely mounted on the shaft 41 and engaged by a toothed segment 44 provided on a two-armed lever 46, which is swingably mounted on a pin 45 and acted upon by a cam-disc 47 fixed on the shaft 10. The toothed wheel 43 is provided with a pawl

48, which engages a ratchet wheel 49 connected to the roller 40, so that, as the toothed segment 44 is moved toward the right, Fig. 4, by the cam-disc 47, the roller 40 is rotated and feeds the strip 24 forwards. The toothed segment is moved in the opposite direction by a spring (not shown) during which movement the roller 40 is held by a counter pawl. In order to keep the strip 24 in a taught condition during the periods the roller 40 is at a standstill, a roller 50 is mounted in a bend of the strip.

The strip 24 fed forwards is pushed into the space between a matrix 51 carried by a steady upright 52 on the frame of the machine, and a stamp 53 carried by a cross piece 54. The cross piece 54 is fixed to two vertical rods 56 movable in lugs 57 on the upright 52 and fixed at their lower ends to a cross head 58. An eccentric 59 is fixed to the shaft 10 and its rod 61 is pivoted to the cross-head 58, so that the stamp 53 is moved upwards and downwards during the rotation of the shaft 10 and cuts the box blank from the strip 24.

The box blank thus stamped from the strip is then transferred to a mechanism in the machine, which folds the blank into the shape shown in Fig. 2. For the transferring of the blank several devices may be used. In the form of execution shown in the drawings the said device consists of an arm 64, which is provided with pins 65 adapted to engage the box blank. Arm 64 is pivoted at 66 to an arm 67, fixed to a shaft 68, which is journaled in two brackets 69 on the lower side of the frame of the machine and carries a second arm 67^x. The shaft 68 carries a swingable elbow-shaped arm 70, which by means of link 71 is connected to the rear end of the arm 64. Arms 67—67^x and 70 are acted upon by cam-discs 71^x and 72 on the shaft 10, Fig. 5. While the arm 67—67^x is swung toward the right, Fig. 4, the elbow-shaped arm 70 by means of the link 71 keeps the arm 64 provided with the pins 65 in a raised position but brings the pins into engagement with the blank at the end of the said movement. The pins remain then in engagement with the blank, while the arm 67—67^x is moved toward the left or effects its feeding movement. At the end of this movement the arm 64 is raised, so that the pins are disengaged from the blank.

In this manner the blank is placed below a piston 87, which is movable upwards and downwards and has the same shape and substantially the same size as the bottom part 1 of the blank. The said piston together with a stationary frame 88, through which the blank is forced are adapted to impart to the blank the shape shown in Fig. 2. The folded blanks are moved downwards by the piston 87 and placed into travelling compartments 73. In the form of execution shown in the drawings the compartments constitute links in an endless chain. These compartments are linked together by spacing links 76 pivoted at their ends by the pins 75 to the lugs 74 projecting from the lower side of the compartments. The chain passes round a guide wheel 77, carried by bearings 78, and a feed wheel 79, the teeth of which engage the spaces between the pins 75. The shaft 80 of the feed wheel 79 is carried by bearings 81 and provided with a ratchet wheel 82, engaged by a pawl 84. The pawl 84 is carried by an arm 83 swingable on the shaft 80 and held in engagement with the ratchet wheel by a spring (not shown). The arm 83 together with the pawl 84 is swung forward and backward by an eccentric 85, which is fixed on the shaft 22 and the rod 86 of which is connected to the arm 83. The chain is advanced by the described mechanism each time through a distance equal to the distance between the centre lines of two adjacent compartments. One of the compartments is placed during each feeding operation below the folding frame 88 and the piston 87. 84^x is a counter-pawl, which holds the chain in adjusted position during the return stroke of the pawl 84. The compartments of the upper part of the chain slide in a channel-shaped guide 88^x which extends longitudinally of the machine and by the inner sides of which the lugs 74 on the lower side of the compartments are guided. The compartments are open at two opposite sides, so that the boxes introduced into the compartments by the piston 87 and then charged with cartridges may be ejected from the compartments transversely of the chain. While the boxes are forced down into the compartments the flaps of the box are guided by plates 106, fixed to the lower side of the frame 88.

The rod 89 of the piston 87 is fixed to a slide 90, which is movable upwards and downwards in a guide provided in an upright 91. The slide 90 is by a link 93 connected to a lever arm 95 which is swingable on a pin 94 and acted upon by a cam-disc 96 on the shaft 18. The said cam-disc moves the piston 87 upwards. The downward movement is imparted to the piston by a spring (not shown). Fig. 5 shows a folded blank forced into the subjacent compartment 73 by piston 87.

Before the blank is forced downwards by the piston 87 through the folding frame 88, the corner flaps 3, Figs. 1 and 2, must be turned upwards so that they will be placed inside the end flaps 2, as the latter are turned upwards, as shown in Fig. 2. The piston 87 is moved downwards in two periods. During the first period the piston is lowered onto the blank of the box, so that it sustains the blank. During the second period the piston pushes the blank through the frame 88 and downwards into the compartment. While the blank is sustained by the piston 87 four tongues 98 are moved upwards through slots provided in the frame 88 and bring the corner flaps 3 into an upright position. The tongues 98 are carried each by an arm 98^x. The arms are fixed to two rotatable shafts 99 and 99^x. An arm 100 extends from the shaft 99 and is connected by a link 101 to an arm 103 which is swingable on a fixed pin 102 and controlled by a cam disc 104 on the shaft 18. The swinging movement may be transmitted from the shaft 99 to the shaft 99^x for instance by means of an arm extending from the shaft 99 and acting upon an arm on the shaft 99^x, or in any other suitable manner. The tongues 98 are moved downwards through the action of the cam-disc 104 on the arm 103 and upwards by a spring (not shown) acting upon the said arm.

As the piston 87 is moved downwards during the second period, it carries with itself the box blank during which movement the end flaps 2, the side flaps 4 and 6 and the flaps 5 and 7 are turned upwards by the folding frame 88 and the corner flaps 3, previously bent upwards, are turned inwards.

The flaps 5 and 7 now occupy the positions shown in Fig. 5. During the movement of the compartments 73 the flaps 2 located at the open ends of the compartments are guided by the walls of the channel 88^x.

The folded box is now moved by the compartment chain to the device feeding the cartridges *a* into the same. The cartridges are mounted by groups of five in holders or frames, which are placed in a channel 108, Figs. 3 and 4. The bottom of the said channel consists of an endless belt 111 running round rollers 109 and 110. On the shaft of the roller 110, driving the belt 111, a sprocket wheel 112 is fixed, which is rotated continuously by a chain 116 passing round guide rollers 113 and 114 and a sprocket wheel 115 on the shaft 22. Consequently, the belt 111 moves forward in the channel 108 tends to advance the cartridges *a* continuously in the channel. The frames together with their cartridges are pushed by subsequent frames into a channel 117 which constitutes a continuation of the channel 108 and from which the groups of cartridges are fed down into the boxes. Two groups of cartridges are placed in each box one above the other, the cartridges of one group pointing in opposite direction with regard to the cartridges of the second group. Preferably a piece of pasteboard or stiff paper is placed between the two groups of cartridges.

Two cartridge tilters 118 and 119 operate at the channel 117 transversely of the machine. The tilter 118 acts upon the group of cartridges *a* at the vicinity of its frame and causes the group of cartridges, sustained at their top ends by a fixed arm 120, to slide downwards with the frame leading in a channel 121, having an inclined bottom. The tilter 119 on the other hand acts upon the group of cartridges *a* in the vicinity of the top ends of the cartridges, or as shown in Fig. 6, acts upon the corresponding projectiles so that the cartridges pass downwards in a channel 121^x with the projectiles leading. Also the said channel 121^x has an inclined bottom. In the side walls of the channel 117 openings are provided, which permit the tilting of the cartridges and the tilters to operate. The tilters are constructed in substantially the same manner, and consist of ribs 118 and 119 respectively fixed to arms 122 and 123. The said arms 122 and 123 are carried by a shaft 124 rotatable in bearings. An arm 125 extends from the shaft 124 and is connected by a link 126 to an arm 128 swingable on a pin 127 and acted upon by a cam disc 129 on the shaft 18, Fig. 6. The said arm is forced against a cam-disc by a spring (not shown), which consequently causes the tilters to effect their working stroke. Consequently, as the arms 122 and 123 are swung forwards or toward the left in Fig. 6, two groups of cartridges fall down in the inclined channels 121 and 121^x. The groups of cartridges slide downwards in the said channels and are placed on tables 131 and 131^x respectively, which are provided with lateral guides for the groups of cartridges. However, the tilters are unable to operate, until there is a frame with cartridges in front of each tilter. For that purpose at the end of the channel 117 an arm 134 is provided, which is swingable on a pin 135 and acted upon by a spring 132, said arm being adapted to act as a stop for the tilters 118 and 119. As the row of cartridges is completed, the arm 134 is forced aside by the foremost cartridge frame, so that the tilters no longer are arrested. The distance between the inclined channels 121 and 121^x together with the tables 131 and 131^x is equal to the distance between the compartments 73 of the chain, so that two adjacent compartments may be placed simultaneously in front of the tables, Fig. 3. Between the tilters there is a room in the channel 117 for a group of cartridges, which afterwards is advanced to the stop 134 by the subsequent groups of cartridges.

After the groups of cartridges have arrived upon the tables 131 and 131^x each is moved further forward by means of pistons 135 and 136 respectively. The actuating mechanisms of the said pistons are of substantially the same construction, for which reason only one of the same is described. The rod 137 of the piston 136 is connected to a two-armed lever 139, 140, which is swingable on a pin 138 and the arm 140 of which is acted upon by a cam-disc 141 on the shaft 18, Fig. 6. The cam-disc 141 effects the return stroke of the piston and a spring (not shown) acting upon the lever 139, 140 effects the working stroke of the piston. Normally, the piston 135 pushes a group of cartridges down into the box mounted in that compartment 73, which is located in front of the piston 135, and as the said compartment has been placed in front of the piston 136, this piston forces a second group of cartridges down into the box, after a piece 142 of pasteboard or stiff paper previously has been mounted in the box in the manner described below. As perceived from Figs. 3 and 6, the two groups of cartridges are turned in opposite directions. Owing to this arrangement the cartridges take the smallest possible place in the box.

If, for some reason there is no group of cartridges in front of the pistons 135 and 136, one or both, and, consequently, the box would be incompletely or not at all charged with cartridges, the machine is stopped. The mechanism adapted herefor is constructed as follows. Above the tables 135 and 136 two cross pieces 144 are located carried by uprights 143 and constituting abutments for two pawls 145 respectively. The said pawls 145 are swingably mounted on pins 146 carried by two arms 148 extending from a shaft 147. Shaft 147 has an arm 149, which by a link 150 is connected to an arm 152 which is swingable on the pin 127 and acted upon by a cam disc 151 on the shaft 18. A spring (not shown) tends to move the arm 152 downwards and thus the pawls 145 upwards. The pawls 145 occupy normally the position shown in Fig. 6, which is determined by a spring and an abutment (not shown) and in which they bear against the cross pieces 144. A finger 154^x extends downwards from each pawl 145 and is located in the path of the groups of cartridges respectively moved forwards on the tables 131 and 131^x by the pistons 135 and 136. As the group of cartridges is advanced by the piston it strikes the finger 154 and brings the pawl 145 out of engagement with the abutment 144. If both pawls 145 are disengaged from the abutment 144, the arms 148 may be swung upwards and the shaft 147 may be rotated. If, on the other hand, there is no group of cartridges in front of the one or the other pistons 135 and 136, the corresponding pawl remains in engagement with the abutment 144, for which reason the arms 148 and the shaft 147 then can not be turned by the corresponding spring. An arm 154^x extends from the shaft 147 toward the arm 139, which arm 154^x, as the pawls 145 are disengaged and the shaft 147 is rotated, is swung downwards out of the path of a pin 155 provided on the arm 139, so that the arm 139 may be freely swung toward the left, Fig. 6. If on the other hand the one or the other pawl 145 is not disengaged, the arm 154^x remains in the position shown in Fig. 6 and prevents the arm 139 from being

swung toward the left. A two-armed lever 157, 158 is pivoted at 156 to the arm 140. One of the arms of the said lever bears against a cam disc 159, which is fixed to the shaft and has exactly the same shape as the cam-disc 141 and the same position peripherically as the cam-disc 141. The other arm 158 bears against the push button 160 of an electric switch 161 appertaining to the driving motor of the packaging machine, so that the circuit is closed. The said switch is carried by a shelf 161^x fixed to the arm 140. As the lever 139, 140 is free, consequently when the pistons 135 and 136 each feed a group of cartridges into the boxes, the arms 140 and 157 keep company acted upon by the equal cam-discs 141 and 159 and the button 160 remains in its inner position and the circuit of the motor is closed. If on the other hand the lever 139, 140 is locked in the manner stated above, consequently, when there is no group of cartridges in front of one of the pistons 135 and 136, the arm 140 remains in its raised position, while the arm 157, acted upon by a spring 162, enters a recess provided in the corresponding cam-disc 159, which results in the arm 158 being moved upwards and the contact of the switch being broken, so that the motor is stopped.

The piece 142 mentioned above is cut from a strip 163 wound round a reel 164, which is journaled in brackets 165. The said strip 163 passes between a feed roller 166, the shaft 167 of which is journaled in brackets 168. The strip is forced against the feed roller by a roller 169. The feed roller is rotated intermittently for instance by means of the usual mechanism comprising a ratchet wheel fixed to its shaft 167 and engaged by a spring actuated pawl on a toothed wheel 170. The said wheel 170 meshes with a toothed segment 171 on a two-armed lever 173, 174 pivoted at 172 and bearing against a cam-disc 175 on the shaft 18. After the strip has been advanced above the box through a suitable distance a piece is cut from the strip by a movable knife 176, co-operating with a stationary knife 177. The knife 176 is carried by a two-armed lever 179, 180, which is swingable on a pin 178, Fig. 9, and by a link 181 is connected to two-armed lever 183, 184, which is swingable on a pin 182 and acted upon by a cam-disc 185 on the shaft 18. The piece cut from the strip 163 falls down into the box.

After two groups of cartridges and an interposed piece of paper have been placed in the box, two presser-feet 186, Fig. 6, are brought into operation, one for each of the boxes, which are charged with cartridges simultaneously. It may happen that a group of cartridges for some reason does not fall down in the box by itself. Through the actuation of the presser-foot 186, lowered toward the group of cartridges, the group is then forced into the box. The presser-feet 186 are carried by a two-armed lever 188, 189 which is common to the same and swingable on a pin 190. The said lever 188, 189 is by means of a link 191 connected to an arm 192, which is swingable on the pin 127 and acted upon by a cam-disc 193. The presser-feet 186 are forced down against the cartridge group by a spring (not shown). A lever arm, similar to the lever arm 157, 158 may be combined with the arm 192, which lever arm bears against a cam-disc of just the same construction as the cam-disc 193 and acts upon the push button of a switch (not shown). The mechanism operates in absolutely the same manner as the current interrupting device described above. If the cartridge-group has such an incorrect position, that the presser-foot 186 is not able to force the group down into the box, the arm 192 is locked and the motor stops.

After the group of cartridges and the piece of paper have been mounted in the box, the flaps 5 and 7 are turned down, viz. first the flap 7 and then the flap 5. The flap 7 is turned down by a plate 194, which by means of a pin 195 is swingably mounted on an elbow-shaped arm 196 and by an abutment and a spring (not shown) is held in the shown position. Arm 196 is swingable on a pin 197 and by a link 198 connected to an elbow-shaped arm 200, which is swingable on a pin 199^x and acted upon by a cam-disc 201 on the shaft 18. The mechanism operates in such manner, that, as the arm 196 is swung downwards, the plate 194 strikes the flap 7 and turns the same downwards. During the continued movement of the arm 196 the lower part of the plate 194 strikes the one side wall of the compartment and causes the plate 194 to turn round the pin 195, so that the plate turns downward the flap completely. In this manner a natural folding of the flap is effected without the flap being subjected to any wrinkling actuation.

On the pin 199^x an elbow-shaped arm 202 is swingably mounted, the one arm of which keeps a switch 203 normally closed, said switch being mounted on an arm 200 and located in the circuit of the motor. Also the elbow-shaped arm 202 is acted upon by the cam-disc 201. The stopping mechanism operates in just the same manner as the mechanisms described above, so that if the arm 196 together with the plate 194 is prevented by the box or the cartridges located in the same from pursuing its downward stroke, and consequently the elbow-shaped arm 200 is locked, the elbow-shaped arm 202 is moved away from the switch 203 and the current is interrupted.

The folding of the flap 5 is effected during the continued movement of the compartment-chain. A plate 205, Fig. 4, is located above the said chain, transversely of the same, and the box passes closely to the plate, so that the plate turns the flap downwards to the box. Plate 205 is carried by an arm 206, which is swingably mounted on a pin 207 and acted upon by a spring 206^x, so that the plate 205 is yieldable.

The box is now transferred by the chain to the station for sealing the same. The sealing of the box is effected by a paper strip which is placed transversely of the same and pasted to the box. According to the form of execution of the invention shown in the drawings a printing device is combined with the sealing mechanism, which provides the strip with a print indicating for instance the year during which the cartridges were packaged, the model of cartridges and so on. The sealing strip 210 is wound round a reel 211, Fig. 8, and is fed forward by a tongs, which may be of any known construction and comprises for instance a fixed jaw 212 and a spring actuated jaw 214 which is swingable on a pin 213. The tongs is carried by a slide 215, which is movable in a guide 217 located transversely of the machine and carried by uprights 217. The slide 215 is connected by means of a link 218 to a lever arm 220, which is swingable on a pin 219 and the lower end of which is connected to a rod 221 of an eccentric 222 mounted on the shaft 18. While the tongs is moved toward the left, Fig. 8, by the slide 215, it is held in open position in order to catch a piece of paper or a label cut from the strip 210 by a

knife 223 and resting on a table 224, said label being adapted to seal the box. After the tongs has placed the label on the box, the tongs is opened and the label released. The paper strip is moved forward on the table 224 by a roller 226, against which it is forced by a roller 227. Roller 226 is rotated intermittently by a mechanism of the same construction as the mechanism feeding the strip 163 and described above. Thus, the mechanism comprises a toothed segment 228, Fig. 7, on a lever arm 231, which is swingably mounted on a pin 229 and acted upon by a cam-disc 230 on the shaft 18. As the strip 210 has been fed forward on the table 224 through a distance corresponding to the length of a label, the knife 223 is lowered. The said knife is carried by a slide 232, which is movable in a guide provided on the upright 216 and by a link 233 is connected to a lever arm 235, swingably mounted on a pin 234 and acted upon by a cam-disc 236 on the shaft 18. The knife 223 co-operates with a knife 237, fixed to the upright 216. The said slide 232 also carries a form 237, provided on a rod 238, which is slidably mounted in a sleeve-shaped holder 239 on the slide 232 and is acted upon downwards by a spring located in the holder. The form 237 is provided with ink by a roller 240, which is carried by an arm 242, swingably mounted on a lever arm 241, Fig. 10. The said lever arm is mounted on a pin 243 and acted upon by a cam-disc 244 on the shaft 18. A lever arm 245 is connected to the arm 242 and is swingable on a pin 246 and acted upon by a cam-disc 244^x on the shaft 18. Owing to the described arrangement the roller 240, provided with ink by a roller 248 which rotates in a receptacle containing ink, is moved under the form 237 and in contact with the same, thus providing the same with ink. The roller 248 may be rotated by any suitable motion transmitting device.

The form provided with ink is now moved downwards together with the knife 223 and effects a print on the piece cut from the paper-strip 210, which then is placed on the box by the tongs in the manner described above. While the label is being transferred to the box, it passes over a roller 249 which rotates in a receptacle 250 containing paste. The said roller is rotated by a toothed wheel 251, fixed to its shaft, a toothed wheel 252 and a toothed wheel 253, on the shaft 254 of which is mounted a sprocket wheel, which by means of a chain 255 is rotated by a sprocket wheel 256 on the shaft 18.

257, Fig. 12, is a plate of India rubber or the like fixed on a rod 258, which is slidably mounted in a bracket 260, Fig. 8, projecting from a slide 262, which is movable upwards and downwards in a guide 261. The said plate is acted upon downwardly by a spring 259 mounted on the rod 258 and bearing against the bracket. On a rod 263, which is fixed to an arm 263^x projecting from the bracket, a plate 263^{xx} is fixed, which carries downwardly extending springy tongues 264, located at opposite sides of the plate 257. Slide 262 is moved by a link 265, as shown in Fig. 8, connected to the same and to a lever arm 267, which is swingable on a pin 266 and acted upon by a cam-disc 268 on the shaft 254. The plate 257 of India rubber and the tongues 264 are located above the box and its label. As the slide 262 is lowered by the described mechanism, the plate 257 forces the label closely to the top side of the box, whereupon the tongues 264, moved further downwards, turn downwards the ends of the label which extend outside the box.

In order to cause the end parts of the label to bear closely against the end sides of the box two rollers 314, Figs. 8 and 13, are journaled on arms 315, which by a spring device (not shown) are forced inwards toward the box. The said arms 315 are carried by pins 210 and 270 provided on a cross-piece 317, which is movable in a guide 316 and by a link 318 is connected to a lever arm 319 swingably mounted on a pin 266 and acted upon by a cam-disc 320 on the shaft 254. As the cross-piece 317 is moved downwards, the said rollers 314 move along the sides of the box and cause the label to bear closely against the same. After the said operation has been performed and the arms 315 are moved upwards, the arms are swung outwards from the box thereby, that one of the arms 315 is provided with an extension 273, which is acted upon by an elbow-shaped arm 275 swingable on a pin 274 and bearing against a cam-disc 276 on the shaft 18. Motion is transmitted from the said arm 315 to the other arm 315 by means of tail pieces 315^x provided on the arms and bearing against one another. In order to render possible the lowering of the rollers the channel 88^x is provided with movable sections 269, which are carried by the arms 315 and consequently partake in the motion of the rollers 314. The arms 315 carry also plane brushes 315 and 316 forming an angle to one another, which brushes effect an additional forcing of the label against the box sealed in the next preceding compartment.

In packaging blank cartridges or cartridges provided with a plug of wood instead of a ball of some metal used for the purpose, it is of the greatest importance that not one or more ball-cartridges have been included in the boxes. Such ball-cartridges would cause terrible accidents for instance during manoeuvres. In order to prevent this the machine is provided with a controlling apparatus, in which each box is subjected to a weighing operation and if it is too heavy and consequently, may contain one or more ball cartridges, is separated from correct boxes.

The finished boxes are transmitted to the controlling apparatus by a slide 278 movable in stationary guides 277. This slide is moved by a cam-disc 279 on the shaft 18 and a two-armed lever 281, 282, which is swingable on a pin 280 and acted upon by a spring (not shown) and the fork-shaped arm 282 of which engages a pin 283 fixed in the slide 278. The slide pushes the box from the compartments 73 and on a bridge and places the same above the platform 284 of a weighing apparatus. In order that the platform 284 may not be acted upon by the transmitted box in lateral sense, the box is supported by two fixed bars 284^x Fig. 14, located at the sides of the platform and at a somewhat higher level, so that the platform rests freely below the same while the box is advanced.

Platform 284 is carried by a rod 285, which is suspended on the edges of two beams 286 and 287. The said beams are swingable on edges provided on an upright 288 and are loaded with weights 289, which tend to move the platform upwards. A rod 308 is slidably mounted in a guide 307 in the frame of the apparatus and provided with a fork 309, by means of which it may engage a pin 310 fixed in the rod 285. In the lower end of the rod 308 a pin 308^x is fixed, against which the fork shaped arm of an elbow lever 311 bears, said lever being swingable on

a shaft 294 and acted upon by a cam-disc 312 on the shaft 22.

290 is a piston adapted to remove the boxes from the platform. Said piston is carried by a lever arm 297, which is swingable on a pin or shaft 298 and acted upon by a cam-disc 297^x on the shaft 22. Piston 290 is caused by a spring (not shown) to effect its working stroke. A rod 301 is pivoted to the arm 297 and is movable in a guide provided in an upright 304 fixed on the frame of the machine. The said rod 301 extends through an opening provided in a plate 302, which is suspended on the lower beam 287 and also is guided by the upright 304. Rod 301 has a projection or dent 305, which is arrested by the plate 302, when the platform is in its normal position.

The apparatus operates in the following manner. As a box has been placed above the platform 284 by the slide 278, the cam disc 312 permits a spring 308^x to move the rod 308 and its fork 309 upwards, so that the weighing apparatus becomes free and the platform is moved upwards by the weights 289 and bears against the box. If the box has the correct weight, the platform is moved further upwards by the weights 289, until the beam 286 strikes an abutment (not shown) on the upright 288. During the said movement the plate 302 disengages the rod 301, so that the dent 305 can pass freely through the opening in the plate 302 and the piston 290 may be preliminarily moved toward the left and, after the platform has been lowered by the cam-disc 312 and the box again rests upon the bars 284^x, pushes the box to a slanting path 291 on which the box slides downwards and is placed in an upright position in a channel 292. The row of boxes gathered in the said channel is advanced through a short distance by a piston 293, carried by a lever arm 296, which is swingable on the shaft 294 and acted upon by a cam-disc 295 on the shaft 22.

As on the other hand a too heavy box is placed on the bars 284^x and the platform 284 is set free in the manner stated above, the platform is forced against the box but is unable to move the same upwards. Consequently, the piston 290 remains in its arrested position and is unable to remove the box. The box, which thus after the lowering of the platform rests on the bars 284^x, is pushed downwards into a channel 306, as the next box is pushed by the slide 278 from a compartment 73 onto the bars 284^x and placed above the platform 284.

The machine described above may, somewhat modified, be used for packaging articles of another nature. Thus the device for feeding the articles into the boxes must be altered in accordance to the articles in question. If the articles consist, for instance of flat pieces x, Fig. 15, the articles may be fed from a magazine 321 and into the box by two reciprocated pistons 322 and 323, which according to the drawings are made integral with one another. The upper piston 322 moves the lowermost article supported by the bottom of the magazine, from the magazine and places the same on a table 324. The lower piston 325 then moves the article from the table into the box, located in a travelling compartment. The article may, if necessary, be forced into box by a presser foot 186^x and an arresting mechanism 144^x, 145^x and members belonging to the same may be provided for stopping the machine, if for some reason no article has been placed on the table.

I claim:

1. In a machine for packaging articles and goods of different nature, for instance cartridges and bandages, the combination of a piston, a folding table through which the piston forces a blank and shapes the same to form a box with upstanding side and end flaps, an endless conveyor having a row of compartments each of which constitute units with bottom and ends open transversely of the conveyor and into which the said boxes are introduced by the said piston, said conveyer having a substantially straight portion, at which the said table and piston are located, means for introducing the articles into the box and located at the straight portion of the conveyer, means also located at the straight portion of the conveyer and adapted to turn down over the box the upstanding flaps, means located at the straight portion of the conveyor and adapted to apply a sealing member on the closed box while remaining in the compartment, and means located at the sides of the conveyor and movable downwardly with relation to the same for forcing the ends of the sealing member against the box.

2. Machine as claimed in claim 1 and adapted to manufacture boxes having corner flaps, characterized by folding members, which turns the corner flaps of the blank upwards, before the side and end flaps are turned upwards, in the folding table, so that the corner flaps will be placed inside the side flaps.

3. Packaging machine as claimed in claim 1 characterized by a device combined with a movable part of the machine for stopping the machine if the said part is prevented from fulfilling its work, said device comprising a member which imparts the motion to the said part, a cam-disc oscillating the said member, a second member oscillated by a cam-disc of the same shape as the cam-disc first mentioned and rotating synchronously with the same, said second member normally keeping closed an electric contact device located in a circuit controlling the supply of driving power to the machine but if the first member is locked through said part opens the said contact.

4. Packaging machine as claimed in claim 1, characterized by a movable device for transferring the articles into the boxes, an arm for imparting motion to the said device, a pawl, located in the path of the said device, and bearing against an abutment, said pawl normally holding an arresting member in such position that it locks the said arm, a cam-disc adapted to oscillate the said arm, said arm carrying a second arm which is acted upon by a cam-disc of the same shape as the cam-disc first mentioned and rotating synchronously with the same and normally keeping closed an electric contact device located in a circuit controlling the supply of driving power to the machine but as the arm first mentioned is locked opens the contact.

5. Packaging machine as claimed in claim 1 and adapted to feed for instance, two groups of cartridges into a box or the like, characterized by two members located at a path along which groups of cartridges mounted in frames are advanced in upright position, one of the said members being adapted to act upon a group of cartridges bearing at their outer end against an abutment and causes the group to tilt down on a table or the like with the frame of the group leading, while the second member acts upon the

outer end of the cartridges, so that the group is caused to tilt with the said end leading.

6. Packaging machine as claimed in claim 1, characterized by a mechanism, which feeds forwards a strip of paper or the like and places its free end part above the open box, and a device for cutting off the said end part, so that it falls down into the box.

7. A form of execution of the device for feeding the articles into the box, as claimed in claim 1, characterized by two reciprocated pistons, one of the pistons moving the articles from a magazine onto a table and the other piston moving the articles into the box,

8. In a machine for packaging articles and goods of different nature, for instance cartridges and bandages, the combination of a piston, a folding table through which the piston forces a blank and shapes the same to form a box with upstanding side and end flaps, an endless conveyer having a row of compartments each of which constitute units with bottom and ends open transversely of the conveyer and into the said boxes are introduced by the said piston, said conveyer having a substantially straight portion, at which the said folding table is located, means for introducing the articles into the box and located at the straight portion of the conveyer, means also located at the straight portion of the conveyer and adapted to turn down over the box the upstanding flaps, means located at the straight portion of the conveyer and adapted to apply a sealing member on the closed box while remaining in the compartment, a piston which is movable downwardly toward the box and forces the sealing member against the same, and tongues, which are movable downwardly to turn the end portions of the sealing member held by the piston against the sides of the box.

9. Packaging machine as claimed in claim 8, characterized by members which are movable downwardly in contact with the end portions of the sealing member turned by the said tongues and then upwardly out of contact with the sealing member.

BROR ANDERS EMIL JOHNSON.