May 3, 1927. 1,627,169

P. GANGLER

MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

Filed Aug. 31, 1926 6 Sheets-Sheet 1

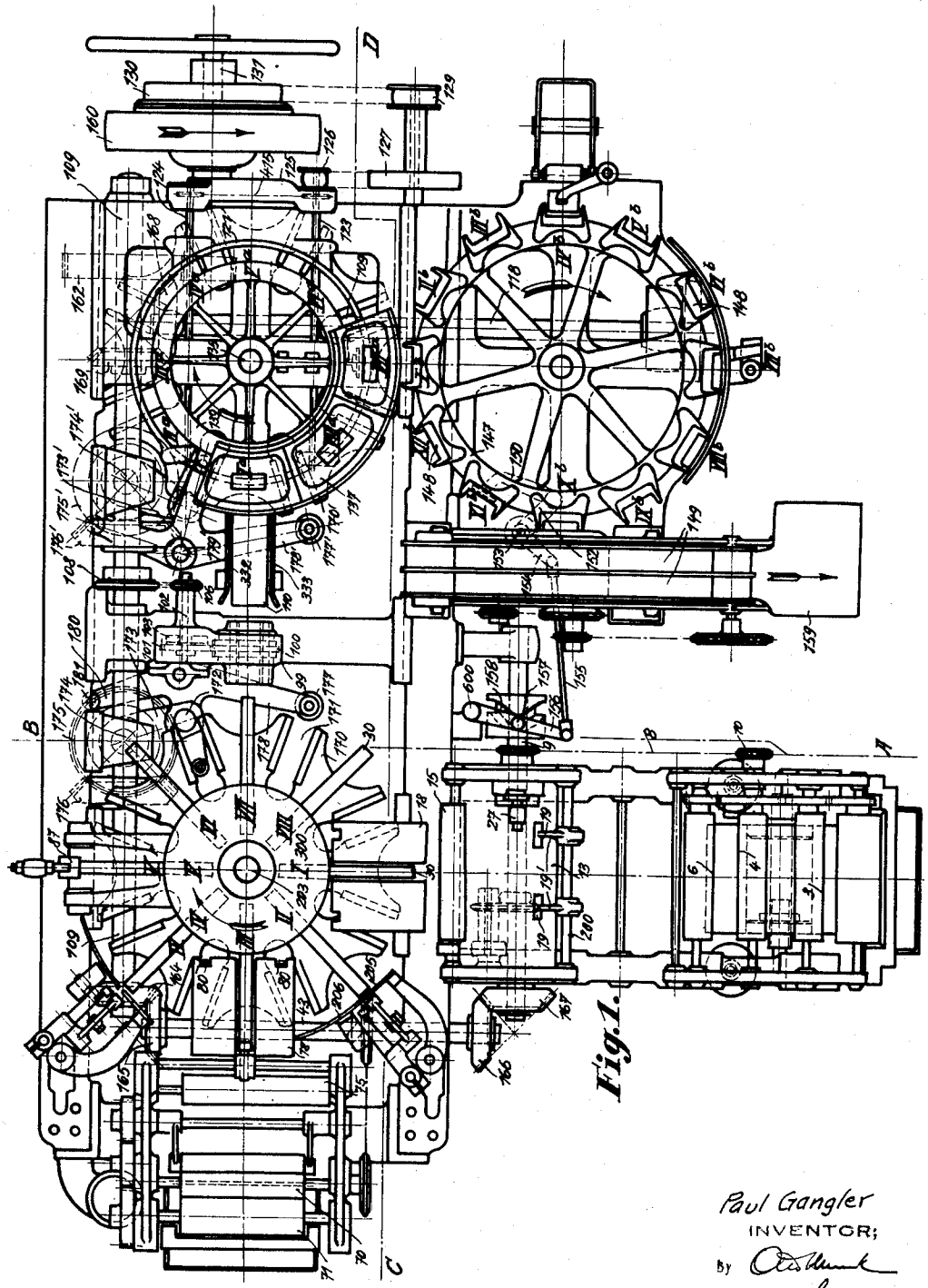


Fig. 1.

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May 3, 1927. 1,627,169

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MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

Filed Aug. 31, 1926 6 Sheets-Sheet 2

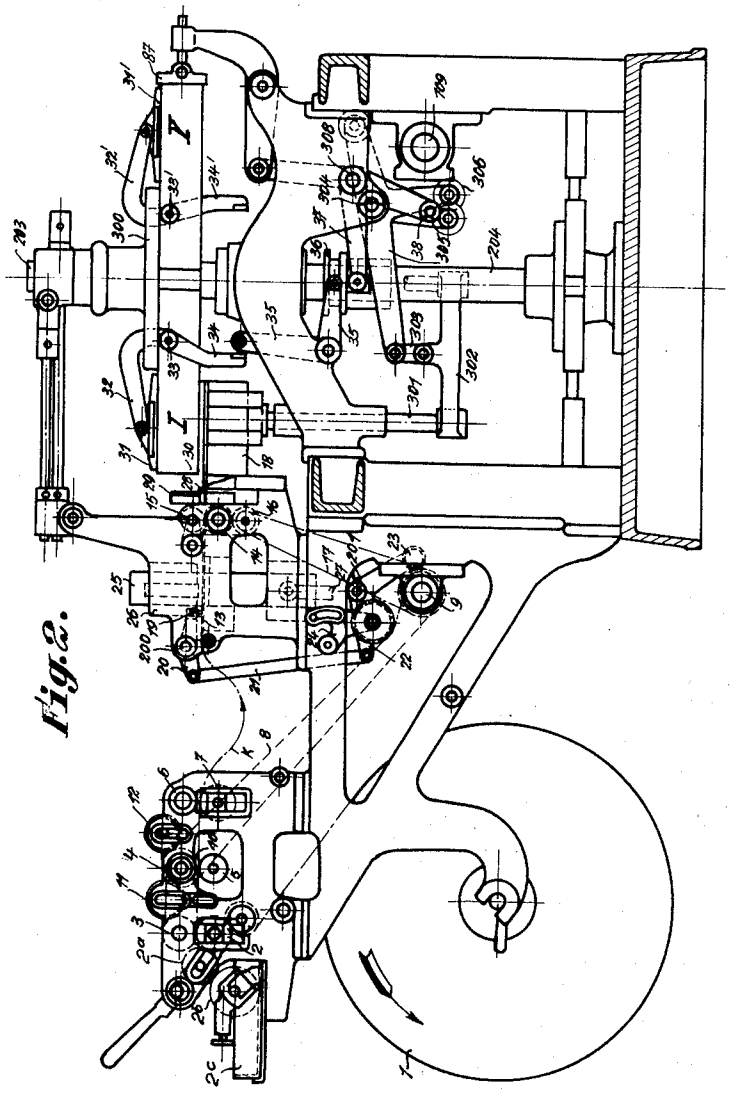


Fig. 2.

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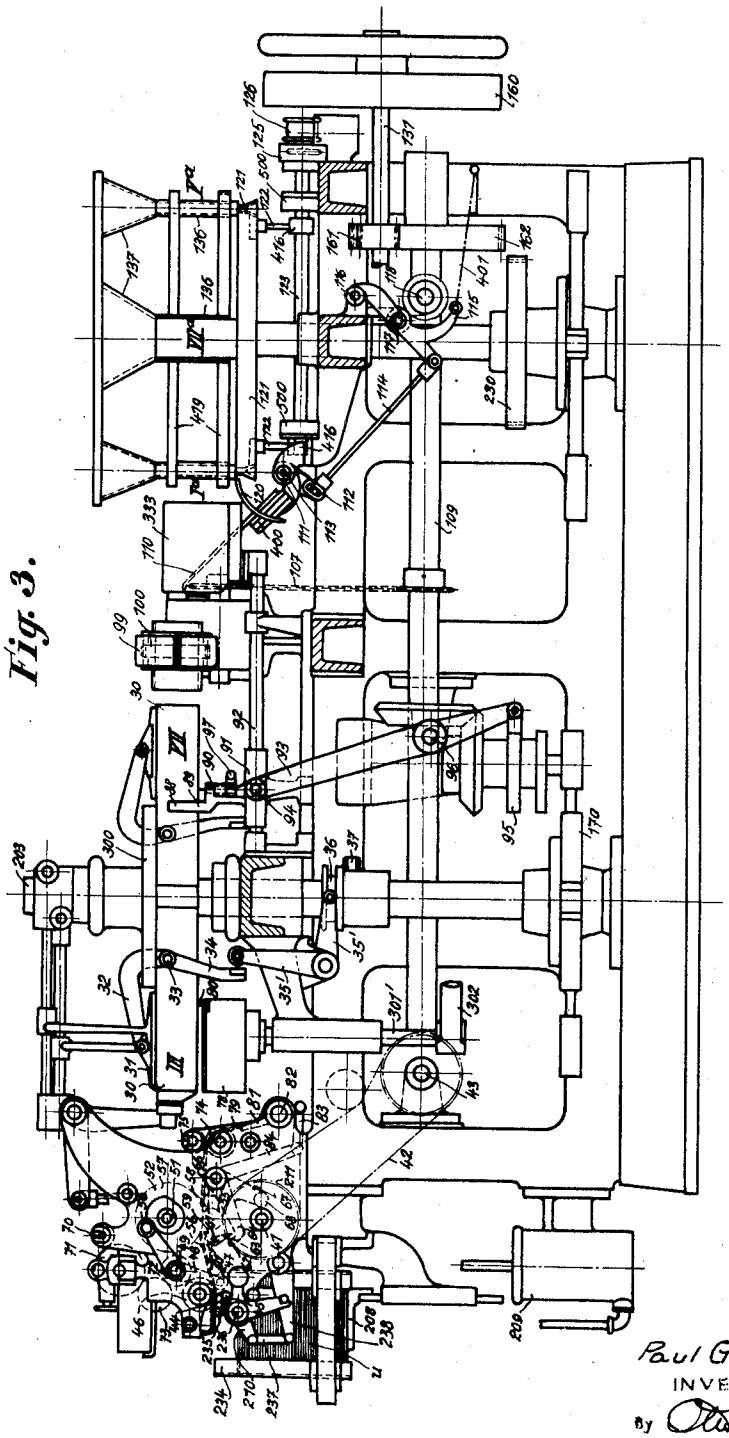
May 3, 1927. 1,627,169

P. GANGLER

MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

Filed Aug. 31, 1926 6 Sheets-Sheet 3

Fig. 3.



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MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

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Fig.3a.

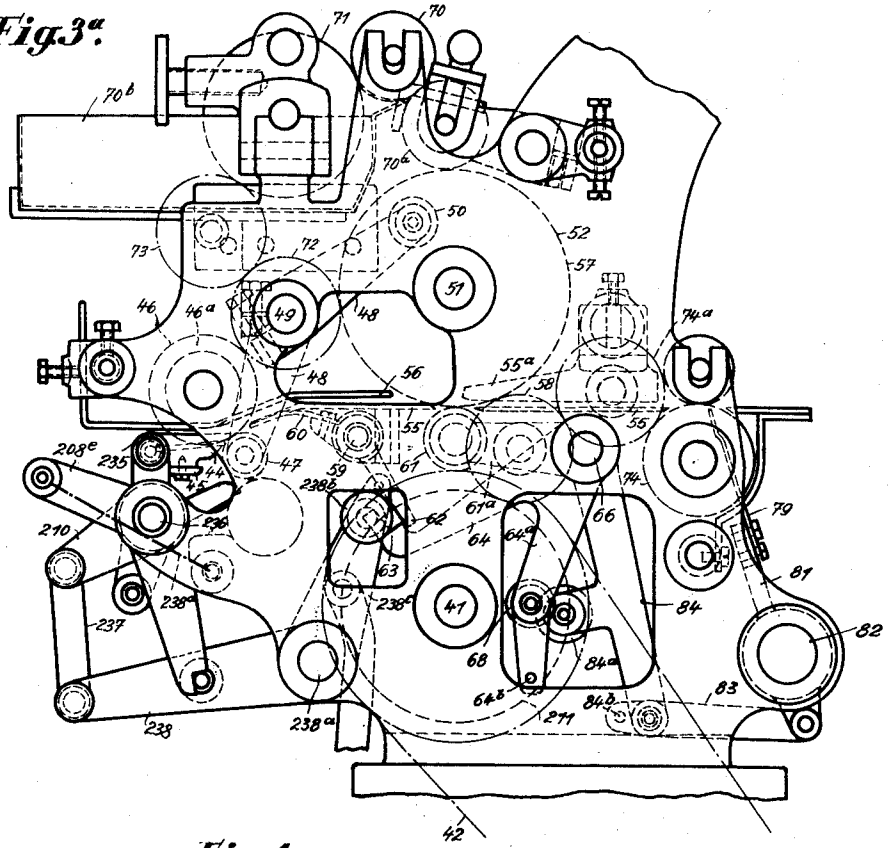
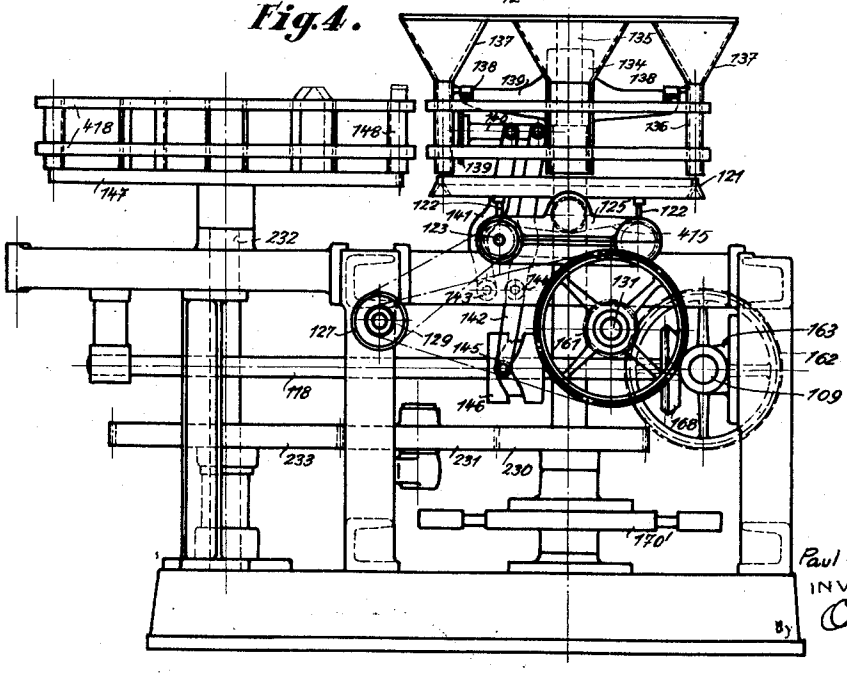


Fig.4.



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MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

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Fig.6.

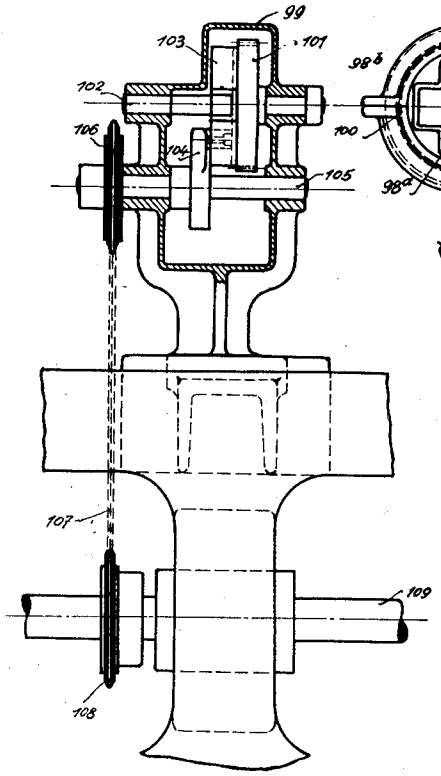


Fig.5.

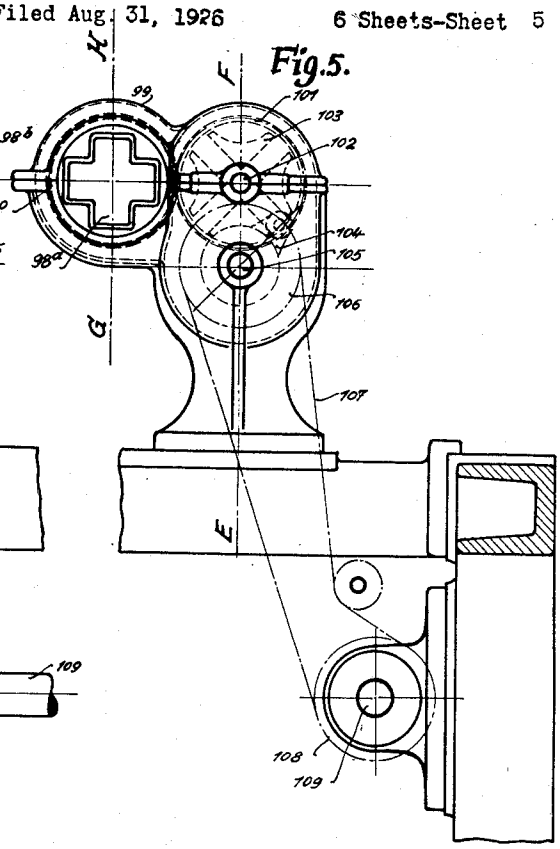


Fig.7.

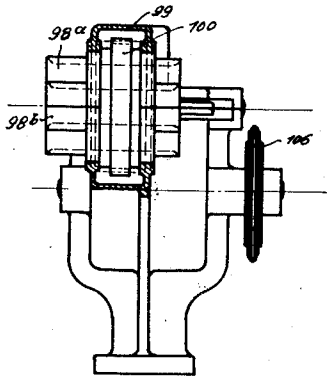
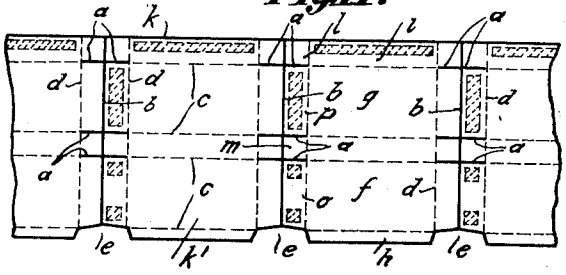


Fig11.



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MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES

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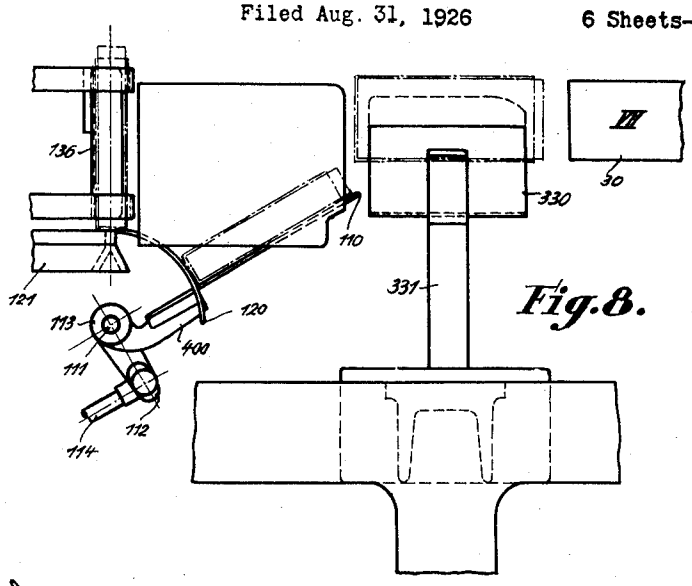


Fig.8.

Fig.9.

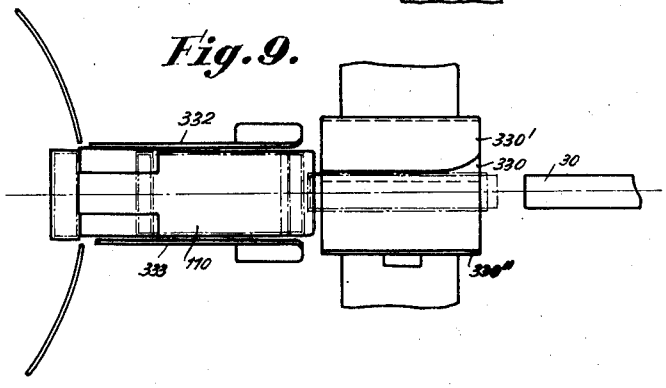


Fig.12.

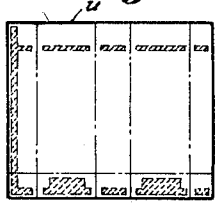


Fig.10.

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by Otto Schmidt
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Patented May 3, 1927. 1,627,169

UNITED STATES PATENT OFFICE.

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MACHINE FOR MANUFACTURING, FILLING, AND CLOSING PACKAGES.

Application filed August 31, 1926, Serial No. 132,699, and in Germany September 17, 1925.

The invention relates to machines for manufacturing, filling and closing packages or bags.

There are known apparatus for notching, punching and cutting out cardboard sheets from a continuous web for the manufacture of folding and the like boxes. There are also known machines which work from a reel or pile, and in which upon a revolving horizontal folding mandrel wheel packages or bags are manufactured which consist of an inner wrapper and an outer envelope. Finally there are known packing machines in which the packages are filled in a revolving horizontal feeding wheel and are closed or sealed in a feed or conveyor wheel also revolving in a horizontal plane.

The present invention relates more particularly to such complete plants in which in a continuous mechanical process the packages consisting of an inner and outer wrapper are first manufactured, then filled with the goods, hereafter closed and finally discharged from the machine. As compared with known plants of this kind, the invention aims at a new arrangement of the individual machine units as well as at a new or improved construction of all or a part of said units in order to combine a clear design and construction with simple attendance and easy noiseless run and to produce in as small a space as possible as high an output as possible.

With this object in view, the complete plant according to the invention consists of a device for notching or grooving and severing the sheets for the inner wrapper from a web of cardboard drawn off a reel, a horizontally revolving folding mandrel wheel receiving the inner wrapper from said device and the sheets for the outer wrapper from a pile and forming the package consisting of the inner wrapper and the outer envelope, a device working from or cooperating with said mandrel wheel and comprising a horizontally revolving feeder or conveyor wheel for filling or charging the packages manufactured on the mandrel wheel, and a device with revolving conveyor wheel for closing or sealing the filled packages delivered by the filling wheel, the inner sheet severing device, the folding mandrel wheel, the conveyor wheel of the filling device and the conveyor wheel of the closing or sealing device being arranged at right angles to each other in a square. By this design and arrangement of the individual units constituting the complete plant a very compact machine is obtained which may easily be supervised and attended to. On the other hand, it is owing to the short ways to be traversed by the articles in the various steps of manufacture and the rotary manner of operation of the individual units possible to drive the complete machine with a very high speed so that a comparatively high output is attained in a very small space.

An embodiment of the improved machine is illustrated in the accompanying drawings by way of example. In the drawings is:

Fig. 1, a plan of a machinery plant arranged and constructed according to the invention for packages consisting of an inner wrapper of cardboard and an outer wrapper of paper.

Fig. 2, a side-elevation of the cardboard severing and punching device and the bag manufacturing device viewed along line A—B of Fig. 1,

Fig. 3, a side-elevation of the bag manufacturing device and of the filling device viewed along line C—D of Fig. 1,

Fig. 3a, on a larger scale, a side-elevation of a device for picking up and feeding forward the outer wrapping sheets,

Fig. 4, a front elevation of the filling and closing machine viewed from the right-hand side of Fig. 1,

Fig. 5, on an enlarged scale, a front elevation of a detail of the mechanism for conveying the packages from the mandrel wheel to the filling wheel,

Fig. 6, a sectional view along line E—F of Fig. 5,

Fig. 7, a sectional view along line G—H of Fig. 5,

Fig. 8, a diagrammatic side-elevation of a modification of the device according to the Figs. 5 to 7,

Fig. 9, a plan,

Fig. 10, a front elevation of this device,

Fig. 11, an elevation of a portion of the cardboard web, and

Fig. 12, an elevation of the sheet of paper of an outer wrapper or envelope.

Like parts are indicated by like numerals or letters of reference in all the figures of the drawings.

Referring in particular to Figs. 1, 3 and 4, it will be seen that the machine is driven by a pulley 160 fixed upon a counter-shaft 131 the rotation of which is transmitted to the main shaft 109 by means of spur wheels 161 and 162. The main shaft is journaled in suitable bearings 163 of the machine frame and drives by means of a pair of bevel wheels 164, 165 (Fig. 1) the shaft 43 likewise journaled in suitable bearings of the machine frame, said shaft 43 transmitting its rotation to the shaft 9 also journaled on the machine frame by means of a pair of bevel wheels 166, 167. The main shaft 109 also drives the shaft 118 journaled on the machine framing by means of a pair of bevel wheels 168 and 169, see Figs. 1 and 4.

The drive of the shaft 203 of the mandrel wheel 300 described hereafter is effected by means of a Maltese cross 170, Fig. 1, mounted upon this shaft, the slots 171 of said cross being adapted to be engaged by the roller 172 of a crank arm 173 which is fixed upon a shaft 174. This shaft is continuously rotated from the main shaft 109 by a pair of bevel wheels 175, 176. The arresting of the Maltese cross 170 when the roller 172 leaves the respective slot, takes place by the temporary entrance of a guide roll 177 of an arm 178 into one of the slots 171. The arm 178 is rotatably journaled upon a pivot (not shown) corresponding to the pivot 179′ and is operated by an arm 180 and the guide roller 181 from an eccentric fixed upon the shaft 174.

The drive of the shaft 135 of the filling wheel 139, Figs. 1 and 4, is effected in exactly the same manner by the Maltese cross 170′ fixed upon the lower end of this shaft, the driving crank 173′, the shaft 174′ and the pair of bevel wheels 175′ and 176′ from the main shaft 109 in cooperation with the fixing crank 178′ with guide roller 177′ which is pivotally mounted upon the above mentioned pin 179′ and in like manner as the crank 178 is driven by an eccentric upon the shaft 174′.

The cardboard web K serving for the manufacture of the inner cardboard wrapper passes from the reel 1, Fig. 2, into a device of known kind, which serves for glueing, cutting, punching and grooving the individual cardboard sheets K′ from the web K, Fig. 11. The roller 2^a serves for applying glue to the marked places necessary for each cardboard sheet to be severed from the web K. For this purpose, the roller 2^a is provided with suitably projecting ledges and segments corresponding to the glue strips to be applied by said roller to the said web and is in contact with a roller 2^b rotating in a well-known manner in the glue container 2^c. The roller 3 is provided with sector-like knives and the roller 2 with corresponding recesses for these knives in order to cut the slits as shown in Fig. 11 into the cardboard web when the rollers 2 and 3 revolve, that is to say simultaneously into the bottom flaps and top closing flaps of two adjacent cardboard sheets K′ which are subsequently severed or separated at *b*. The roller 4 serves as counter roller for the rotary cutting blades 5 which serve the purpose to produce the longitudinal grooves *c* in the cardboard web. Of this last pair of rollers the roller 7 is smooth and the roller 6 is provided with transverse knives for producing the transverse slits *d* in the cardboard web K.

The drive of the rollers takes place continuously from the driving shaft 9 by means of a chain 8 and a sprocket wheel 10 mounted upon the spindle of the roller 4. The rollers 2, 2^a and 3 coupled together by spur wheels are driven by a spur wheel of the roller 4 by means of the spur wheel 11, and the rollers 6 and 7 likewise coupled by spur wheels are driven by means of the spur wheel 12. The drive of all the rollers is thus effected positively from the shaft 9, and merely the cutting blades 5 are journaled loosely rotatable. The lower rollers are adjustable, the upper ones may be lifted off by means of eccentric bearings as is well known in the art.

Upon the table 13, the web K is moved forward by a quickly revolving roller 14 which is in frictional contact with a loosely rotatable roller 15 while the roller 14 is likewise continuously driven from the shaft 9 by the sprocket wheel 16 and chain drive 17.

The circumference of the rollers 2^a, 2, 3, 4, 6 and 7 corresponds with the desired length of the sheet K′, Fig. 11, so that the roller 14 pushes each time a correct length of leaf from the table 13 upon the folding box 18 of well-known construction. As soon as this has happened, the arresters 19 move downwards and interrupt the further feeding of the web K upon the table 13 so that the web K which is continuously fed forwards by the rollers 2—7 sags in a recess, Fig. 2. The arresters 19, Figs. 1 and 2, are formed by rubber ledges fixed upon arms 19′ mounted upon a shaft 200 journaled in the machine frame, which shaft is controlled by means of a crank 20 mounted upon said shaft, a guide rod 21, the bell-crank lever 22 fixed upon the shaft 201 and the guide roller 23 from an eccentric of the driving shaft 9 against the resistance of a spring,

not shown, in such a manner that the arresters 19 are moved up and down at the correct moments.

As soon as the arresters 19 have come in contact with the web, the punching of the corners at *e*, Fig. 11, takes place by a knife which is mounted upon a slide rail 25. The up and down motion of the rail 25 in the guide 26 of the machine frame takes place by the connecting rod 27 from an eccentric mounted upon the driving shaft 9. Simultaneously with the punch cut *e* the end of web K fed forward and resting upon the folding box 18, station I, is cut off the web at *b* by means of a knife 28 which by means of a drive of known construction and therefore not illustrated is moved upwards by means of a suitable eccentric of the shaft 9 and which cooperates in the manner of a pair of scissors with a stationary knife 29.

Above the folding box 18 are moved in succession the mandrels 30 (eight in number in the present case) of the above mentioned mandrel wheel 300 which is mounted upon the shaft 203 which is intermittently rotated from the driving shaft 109 by means of the described Maltese cross drive so that the mandrel wheel is moved forward by one eighth of a circle each time. By the upward motion of the folding box 18, which possesses the well-known shape of a U-formed trough, by means of the rod 301, cross-head 302, guide rod 303, bell-crank lever 305 pivoted at 304, guide-roller 306, and an eccentric upon the main shaft 109, the sides *f* and *g*, Fig. 11, of the cardboard sheet are folded in known manner around the circumference of the mandrel 30 whereupon, likewise in known manner, by means of lateral folding slides the edges *h* and *i* of the now U-shaped work piece are folded down upon the top side of the mandrel, first the edge not provided with the adhesive (*h*) and then that provided with the adhesive (*i*). During this folding operation, the presser plunger 31 of well-known construction is being raised by means of the lever 32, 34 pivoted at 33 which has been turned upwards by double lever 35. The control of the lever 35 is effected by a sleeve 36 adapted to be moved up and down upon the hollow shaft 204 by means of the double lever 37 pivoted at 308 and the guide roller 38 from an eccentric mounted upon the driving shaft 109.

After the just described formation of the cardboard tube or hose, the presser plunger 31 is lowered upon the upper gummed seam of the tube, and the folding box 18 returns into the position illustrated in Fig. 2, whereupon the mandrel cross is turned forward by one eighth of a complete circle and reaches the station II where the bottom of the inner cardboard tube or wrapper is formed in well-known manner by the two upper and lower narrow flaps *l* and *m*, Fig. 11, being first folded over by swinging folders and then the lateral closing flap *o* situated at the rear seen in the direction of rotation by means of folder 205, Fig. 1. The folding over of the last closing flap *p* takes place during the next forward motion of the mandrel wheel from the station II to the station III by means of a stationary folder 206, as is also known.

When the mandrel 30 has reached the station III, the folding over of the outer paper wrapper takes place. The sheets or leaves *u* serving for the formation of said outer paper wrapper, Fig. 12, are piled up in a receptacle formed by angles 234 and provided with a bottom 208 which gradually ascends to the top as is well-known in the art. The withdrawal of the uppermost sheet for the time being takes place first by raising the front edge of said sheet by means of a rocking suction device. This device consists of a suction pipe 235, Figs. 3 and 3ª, connected with an air pump 209 and which is mounted with its downwardly cranked opposite ends upon the shaft 236. The rocking of the shaft 236 takes place by means of the crank 210, guide rod 237 and arm 238 of the rotatable pin 238ª which is controlled by a second arm 238ᶜ mounted upon said pin and provided with a guide roller 238ᵇ from a suitable eccentric of the shaft 41 against the resistance of a spring indicated at 238ᵈ of the arm 238ᵉ mounted upon the shaft 236. The drive of the shaft 41 takes place continuously by the chain gear 42 from the driving shaft 43.

The rocking suction tube 235 is provided with a suitable number of suction branches 44, for instance four, which carry a common folding rail 45 that during the downward motion of the suction branches 44 imparts to the front sheet edge of the pile a preliminary upward bend. During the upward motion of the suction branches, the front edge of the sheet is brought into contact with a roller 46 which is continuously rotated and with which cooperates a roller 47 which by means of arms 48 arranged at both sides is adapted to be oscillated around a pin 49, the arms 48 being provided with guide rollers 50 cooperating with appropriate eccentrics upon the shaft 51. The rotation of the shaft 51 takes place by the spur wheel 52 and the intermediate wheel 58 from a spur wheel 211 mounted upon the shaft 41. The roller 46 is provided with circumferential grooves 46ª into which the suction heads 44 are capable to enter during their upward motion.

When the front edge of the sheet bent upwards is placed against the continuously revolving roller 46 by means of the suction heads, the roller 47 is swung against said roller 46 and by cooperation of the rollers

46 and 47 the sheet of paper is conveyed from the pile first between a rail 55 and wires 56 and then between a gumming roller 57 rotated by the spindle 51 and a rocking counter-roller 61 whereupon the roller 47 returns into its inoperative position. In the Fig. 3, the spur wheel 52 and the gumming roller 57 coincide. The roller 57 is provided with ledges for applying adhesive to the places of the paper sheet u shown shaded in Fig. 12. The application of the adhesive upon the roller 57 takes place in known manner from the gumming roller 71 by intermediate rollers 70^a and 70. Roller 71 is rotated in the receptacle 70^b containing the gum or the like from the shaft 51 by means of the spur wheel 52 and the intermediate wheels 72 and 73.

A feeler 60 is capable of passing upwards and through a slot in said sheet 55 and said wires 56. The feeler as well as a heavier trap 62 are mounted on a rotary bolt 59. The trap 62 has owing to its greater weight the tendency to move the feeler 60 upwards. The counter-roller 61 is mounted upon the rotatable shaft 66 by means of arm 61^a upon which shaft is likewise mounted a bell-crank lever 64 with nose 63. The arm 64^a of the lever is held with a guide roller 68 against a cam upon the shaft 41 by a spring (not shown) engaging at 64^b. When there is a sheet of paper beneath the wires 56, the feeler 60 is kept down by it in the position shown in Figs. 3 and 3^a in which the trap 62 releases the projection 63 of the arm 64 so that the counter roller 61 may be pressed against the gumming roller 57 by the shaft 66, the bell-crank lever 64 and the mentioned spring not shown, provided that the cam on the shaft 41 permits it. If on the other hand there is no sheet of paper beneath the wires, the trap 62 can move vertically so that the arm 64 is locked by the nose 63 coming into contact with the trap 62 so that the roller 61 cannot be forced against the roller 57 whereby a soiling of the counter roller 61 is prevented.

From the adhesive roller the envelope u passes between conveyor rollers 74 and 75 the latter resting upon the former which is driven from the spur wheel 58 by means of an intermediate wheel 74^a. The pulling up of the envelope by the adhesive roller is prevented by counter rails 55^a.

The envelope is conveyed at station III upon the usual U-shaped folding box 78 after leaving the conveyor rollers 74, 75 by fingers 79 arranged at both sides up to the stationary but adjustable stops 80 so that it rests upon the folding box 78 always in the correct position. The fingers 79 are mounted upon an arm 81 which is rotatable at 82 and is actuated by means of the hinge 83 by the arm 84 which is journaled upon the spindle 66 and operated by means of a guide roller 84^a by a suitable cam upon the shaft 41 against the resistance of a spring (not shown) engaging at 84^b. At the station III, the tubular outer envelope is wrapped around the inner cardboard tube upon the mandrel 30 in a similar manner as described with reference to station I. The folding box 78 is operated simultaneously with the folding box 18 of the station I by the rod 301′ from the cross-head 302 and likewise the longitudinal seam presser 31 in a similar manner and by the same drive as at station I, as is indicated by a corresponding marking of the parts.

As the mandrel wheel is turned forward, the formation of the bottom of the wrapper takes place at the station IV and between the stations IV and V in a similar manner as above described and illustrated for the inner cardboard wrapper. At station V the bottom is pressed down in known manner by a plunger 87, Figs. 1 and 2. After at station VI a repeated pressing down of the bottom has taken place, if desired, the package reaches the station VII where the discharge of the package or bag consisting of the inner and outer wrapper and closed at the bottom takes place by means of hooks 88, Fig. 3, fixed upon arms 89 and adapted to pass into the interior of the mandrel through lateral longitudinal slots in the circumference of the mandrel.

The arms 89 are pivoted upon bolts 90 of a carriage 91 and may be turned against the sides of the mandrel. The carriage is adapted to slide upon a bolt 92 and to be operated by a lever 93 by means of a slide-link block of the bolt 94. The lever 93 is pivoted at 96 and is driven by a link 95 from a suitable cam upon the shaft 43. The hooks 88 are controlled by a spring 97 which has the tendency to pull them into the recesses of the mandrel. When the respective mandrel arrives at station VII, the hooks are in their outer position and are then turned into the lateral recesses of the sides of the mandrel by the spring 97 so that they engage at the rear edge of the package and slip the package off the mandrel when now the carriage 91 is moved towards the outside, and convey it into a device in which the package is reversed by an angle of 90 degrees into a position in which it is to be conveyed into the filling machine.

Said reversing mechanism consists, in the embodiment illustrated in the Figs. 1, 3 and 5–7, of a wheel 100 which is rotatably journaled in a casing 99 and provided with passages 98^a and 98^b of the approximate cross-section of the package and intersecting each other at an angle of 90°. The said wheel is provided with a circumferential toothed rim which is engaged by a spur wheel 101 rotatable with a shaft 102 and adapted to be rotated intermittently through

an angle of 90° by a Maltese-cross 103 by means of the crank 104 of a shaft 105. Said shaft 105 is driven by a chain wheel 106 and chain 107 from a chain wheel 108 of the driving shaft 109. The drive is such that the reversing device is turned through an angle of 90° each time it has received a package and it ensures a good guidance and support of the package when being discharged from the package manufacturing machine as well as the turning of the package into its broad and correct position while passing on to the hereafter described device serving for transmitting the package into the filling machine. A further advantage of this reversing device resides in the feature that the package turned through an angle of 90° in the reversal mechanism 100 and thus resting in the horizontal slot of said mechanism is moved forward upon the said transmitting device without employing any special device merely by the discharge of the next package from the mandrel of the bag manufacturing machine into the vertical slot of the reversing apparatus.

In the embodiment illustrated, a spoon 110 serves as transmitting device, Fig. 3, which by means of an arm 400 is mounted upon a sleeve 113 rotatably journaled at 111, and which is operated by a crank 112 likewise mounted on the sleeve 113, the link 114, the lever 115 pivoted at 116 and guide roller 117 against the resistance of the spring 401 from a suitable cam upon the driving shaft 118. When the package has passed from the reversing apparatus on to the spoon 110, the latter is turned into its upright position and the package is conveyed on the curved member 120 between guiding plates 332 and 333, Fig. 1, into the opposite pocket 136 of the closing wheel 139.

In the modification of the reversing device illustrated in the Figs. 8 to 10, the conveyance of the package from the reversing device on to the spoon is also effected by the push of the following package but the turning through an angle of 90° from the end position (on the mandrel) into the broad position does not take place positively. In this case, a tipping device is provided between the station VII and the spoon 110 in the form of an inclined channel 330 fixed upon the machine table by means of an angle 331. The channel 330 is, in relation to the mandrel 30 of the station VII, arranged at such a height and inclined through such an angle that the package pulled off the mandrel 30 takes up automatically the oblique position in the channel 330 indicated in broken lines in Fig. 10, the wall 330′ preventing the tipping of the package towards the wrong side and the package sliding downwards along the opposite wall 330″ into the oblique position. In consequence of the relative elevations of the channel or gutter 330 and the mandrel 30, the tipped package still extends into the path of the mandrel 30 with its upper part so that when the next package is slipped off the mandrel 30, its front face encounters the upper part of the facing front surface of the package resting in the tipped position in the gutter 330, and the fresh package pushes the package already in the gutter in front of it and out of the gutter on to the spoon 110 between the stationary walls 332 and 333 whereby the package has taken up the broad side position necessary for the filling wheel. The further conveyance of the package into the opposite pocket 136 of the filling wheel takes place in the manner already described.

The filling wheel 139 is mounted upon the shaft 135 and is turned by the above described Maltese-cross drive in the same step as the mandrel wheel 300 intermittently by one eighth of a complete circle at a time from stations I^a to $VIII^a$. The eight pockets or holders 136 for the packings are mounted upon the spider rim of the wheel 139 by means of the flange extension 138 and each pocket is provided with a stationary funnel 137.

The packages rest in the filling wheel upon a ring 121 which is subjected to quickly following short vibrations or oscillations. The packages are thus during and after the filling process up to the discharge from the filling wheel subjected to a continuous violent shaking so that the contents of the package is well rammed down from the filling to the discharge of the package from the filling wheel. In the design illustrated the shaking ring 121 rests at four places by means of supports 122 upon quickly rotating shafts 123 and 124 by means of eccentric bearings 416 of very small eccentricity (about 1 mm.) as shown for shaft 123 in Fig. 3. As is also shown for shaft 123 in Fig. 3, the shafts 123 and 124 are concentrically journaled at 500 and carry as is illustrated in Figs. 1 and 4 in a casing 125 a sprocket wheel each, over which a chain 415 is placed, and the shaft 123 is driven by a pulley 126 from the pulley 127 which in its turn is driven by the pulley 129 from the pulley 130 from the counter driving shaft 131. At the station I^a, the package coming from the manufacturing machine is inserted into the pocket 136 at this station by means of the spoon 110, and at the stations II^a and III^a the filling of two packages takes place simultaneously by stationary double filling devices of any known construction arranged above these stations.

The ejection of the charged and rammed packages into the closing wheel 147 takes place at station VII^a by a plunger 139 mounted upon a rod 140 which is parallel guided by the guide rods 141 and 142. The

guide rod 141 is pivoted upon bolt 143 and the guide rod 142 upon bolt 144. The guide rod 142 engages a barrel cam 146 by means of a guide bowl 145 which cam is mounted upon the driving shaft 118.

The closing wheel 147 is provided with twelve pockets or boxes 148 for the reception of the filled packets and is rotated from the shaft 135 of the filling wheel 139 by means of a toothed wheel 230 mounted upon said shaft, an intermediate toothed wheel 231 and a gear wheel 233 fixed upon the shaft 232 of the closing wheel 147 in the ratio of transmission 2:3 so that the pockets 148 of the closing wheel pass gradually through the twelve stations I^b to XII^b. The dropping out of the packages from the closing wheel 147 is prevented by the hoops 418 and from the filling wheel by the hoops 419.

The closing of the inner cardboard wrapper and the outer envelope takes place during the cycle of operations of the closing wheel 147 by well-known means and which are therefore not illustrated and described in detail. By these devices the lateral broad flaps of the inner cardboard tube are folded down up the filling at station II^b. At station III^b takes place the common folding down of the small rear flaps of the cardboard tube as well as of the paper wrapper towards the inside. Between stations III^b and IV^b, the front narrow end flaps of cardboard and paper wrapper are both folded towards the inside by a curved stationary folder which simultaneously folds the two lateral ears projecting upwards from the outer wrapper horizontally outwards, so that at station IV^b by a gumming device of well-known construction an adhesive can be applied to these two ears. On the path from stations IV^b to VI^b, the glued ears are then gradually folded down towards the inside by laterally arranged stationary curved folders and closed. Along the path from station VI^b to XI^b, the seal remains under the pressure of an upper press rail of known construction.

At the station XI^b, the ejection of the completely closed filled package takes place into a conveyor which is arranged sideways to the closing wheel between this wheel and the cardboard cutting and notching mechanism. The conveyor consists in known manner of an upper double belt 149 and a double belt arranged below it at the elevation of the packages. The ejection takes place by the arm 150 firmly united with the arm 152. The latter is mounted upon a rotatable bolt 153 which is controlled by the crank 154 and the connecting rod 155 from the lever 156 with guide roller 157 and pivoted at 600 from a barrel cam 158 upon the driving shaft 9. The upper and lower conveyor belts are placed around rollers which are driven from the shaft 9 by means of the shown sprocket wheels in such a manner that the lower weighted portion of the upper double strap and the upper portion of the lower double strap running upon a supporting guide rail move at equal speeds in the direction of the arrow, Fig. 1, and convey the packages in upright position upon a table 159.

It will be understood that various changes and modifications may be made in the details of construction without departing from the spirit of my invention or sacrificing any of its advantages, and I desire that all such modifications be covered by the following claims which are to be considered limited by the state of the art only.

I claim as my invention:—

1. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a reel for paper web for the inner wrapper, a device for notching and severing the sheets for the inner wrapper off said web, a pile of sheets for the outer wrapper, a horizontally rotatating folding mandrel wheel and means adapted to withdraw the sheets for the inner wrapper from said severing device and the sheets for the outer wrapper from said pile and to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured on said mandrel wheel, and a device adapted to work in conjunction with said filling device and comprising a horizontally revolving conveyor wheel and means for closing the filled packages discharged from said filling wheel, said severing device for the inner sheet, said folding mandrel wheel, said conveyor wheel of the filling device and said conveyor wheel of the closing device being arranged at right angles to each other so as to form substantially a square.

2. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a reel for paper web for the inner wrapper, a device for notching and severing the sheets for the inner wrapper off said web, a pile of sheets for the outer wrapper, a horizontally rotating folding mandrel wheel and means adapted to withdraw the sheets for the inner wrapper from said severing device and the sheets for the outer wrapper from said pile and to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, a device adapted to work in conjunc-

tion with said filling device and comprising a revolving conveyor wheel and means for closing the filled packages discharged from said filling device, means for ejecting the finished closed packages from said closing device and a device for conveying the ejected closed packages out of the machine, said severing device for the inner sheet, said folding mandrel wheel, said conveyor wheel of the filling device and said conveyor wheel of the closing device being arranged at right angles to each other so as to form substantially a square, and said conveying device being arranged sideways of and between said closing device and the severing device for the inner wrappings.

3. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a reel for paper web for the inner wrapper, a severing device comprising continuously revolving gumming, notching and cutting rollers, means for passing said web through said rollers, a guide table for said web, feed drums for drawing said web on said table to a folding box, means for arresting said web on said guide table, means for cutting off the length of a sheet from said web, means for again advancing said web by the length of an inner sheet upon said folding box, a pile of sheets for the outer wrapper, a horizontally rotating folding mandrel wheel cooperating with said folding box and with means adapted to withdraw the sheets for the inner wrapper from said severing device and the sheets for the outer wrapper from said pile and to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling device.

4. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, a pile of sheets for the outer wrapper, pairs of feeding rollers for supplying the outer wrapping sheets from said pile into said folding mandrel wheel, a revolving gumming roller between said pairs of feeding rollers, a counter roller to said gumming roller, means for continuously rotating one roller of each pair of said feeding rollers and means for bringing the other roller of the first pair of feeding rollers intermittently into and out of engagement with said continuously revolving roller for feeding a sheet of the outer wrapper, means for forming the package consisting of the inner and outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling device.

5. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, a pile of sheets for the outer wrapper, pairs of feeding rollers for supplying the outer wrapping sheets from said pile into said folding mandrel wheel, a revolving gumming roller between said pairs of feeding rollers, a counter roller to said gumming roller, means for continuously rotating one roller of each pair of feeding rollers and means for bringing the other roller of the first pair of feeding rollers intermittently into and out of engagement with said continuously revolving roller, a swinging suction device between said pile of outer wrappers and said continuously rotated roller of the first pair of feed rollers, a rail upon said suction device adapted to bend the front edge of the uppermost sheet of the pile upwards against said continuously revolving roller, means for forming the package consisting of an inner and outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to cooperate with said filling device and comprising means for closing the filled packages discharged from said filling device.

6. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, a pile of sheets for the outer wrappers, pairs of feeding rollers for supplying the outer wrapping sheets from said pile into said folding mandrel wheel, a revolving gumming roller between said pairs of conveying rollers, a counter roller to said gumming roller, means for continuously rotating one roller of each pair of feeding rollers and means for bringing the other roller of the first pair of feeding rollers intermittently into and out of engagement with said continuously revolving roller, grippers adapted to rock between the last pair of feeding rollers and a folding box cooperating with said folding mandrel wheel and to convey the outer wrapper from said last pair of feeding rollers to said folding box, means for forming the package

consisting of an inner and outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to cooperate with said filling device and comprising means for closing the filled packages discharged from said filling device.

7. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, a pile of sheets for the outer wrappers, pairs of feeding rollers for supplying the outer wrapping sheets from said pile into said folding mandrel wheel, a revolving gumming roller between said pairs of conveying rollers, a counter roller to said gumming roller, means for continuously rotating one roller of each pair of feeding rollers and means for bringing the other roller of the first pair of feeding rollers intermittently into and out of engagement with said continuously revolving roller, grippers adapted to rock between the last pair of feeding rollers and a folding box cooperating with said folding mandrel wheel and to convey the outer wrapper from said last pair of feeding rollers to said folding box, a swinging suction device between said pile of outer wrappers and said continuously rotated roller of the first pair of feed rollers, a rail upon said suction device adapted to bend the front edge of the uppermost sheet of said pile upwards against said continuously revolving roller, means for forming the package consisting of an inner and outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to cooperate with said filling device and comprising means for closing the filled packages discharged from said filling device.

8. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, a pile of sheets for the outer wrapper, pairs of feeding rollers for supplying the outer wrapping sheets from said pile into said folding mandrel wheel, a revolving gumming roller between said pairs of conveying rollers, a counter roller to said gumming roller, means for continuously rotating one roller of each pair of feeding rollers and means for bringing the other roller of the first pair of rollers intermittently into and out of engagement with said continuously revolving roller, said counter-roller being adapted to rock in relation to said gumming roller, a feeler for controlling said counter roller and permitting it to move into its operative position, when a sheet is present, and locking it in its inoperative position when a sheet has failed, means for forming the package consisting of the inner and outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising means for filling the packages manufactured in said mandrel wheel, and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling device.

9. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontal rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, means for supplying the sheets for the outer wrapper to said mandrel wheel, means adapted to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, means for transferring the package from said folding mandrel wheel into the conveyor wheel of said filling device, means for turning the package through an angle of 90° during this transfer, and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling wheel.

10. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, means for supplying the sheets for the outer wrapper to said mandrel wheel, means adapted to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, means for transferring the package from said folding mandrel wheel into the conveyor wheel of said filling device, means for turning the package through an angle of 90° during this transfer consisting of a wheel arranged opposite the ejecting position of said folding mandrel wheel, adapted to be intermittently rotated through an angle of 90° and provided with two passages at right angles to each other and each adapted to receive the package, means for

transmitting the package from said transferring wheel into the conveyor wheel of the filling device and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling wheel.

11. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, means for supplying the sheets for the outer wrapper to said mandrel wheel, means adapted to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, a support for said packages in said filling wheel adapted to be subjected to quick oscillations, and a device adapted to work in conjunction with said filling device and comprising means for closing the filled packages discharged from said filling wheel.

12. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, means for supplying the sheets for the outer wrapper to said mandrel wheel, means adapted to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontally rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, a support for said packages in said filling wheel consisting of a ring resting upon eccentric bearings of quickly rotating shafts, and a device adapted to work in conjunction with said filling mechanism and comprising means for closing the filled packages discharged from said filling wheel.

13. In a machine for manufacturing, filling and closing packages consisting of an inner and an outer wrapper, in combination, a horizontally rotating folding mandrel wheel, means for supplying the sheets for the inner wrapper to said mandrel wheel, means for supplying the sheets for the outer wrapper to said mandrel wheel, means adapted to form the package consisting of an inner and an outer wrapper upon said mandrel wheel, a device adapted to work in conjunction with said mandrel wheel and comprising a horizontal rotating conveyor wheel and means for filling the packages manufactured in said mandrel wheel, a multiple filling device adapted to fill simultaneously a plurality of packages of said filling wheel, and a device adapted to work in conjunction with said filling device and comprising the filled packages discharged from said filling wheel.

In testimony whereof I have affixed my signature.

PAUL GANGLER.