April 14, 1925. 1,533,455

J. PETERSON ET AL

PACKAGING MECHANISM

Filed Feb. 23, 1921 5 Sheets-Sheet 1

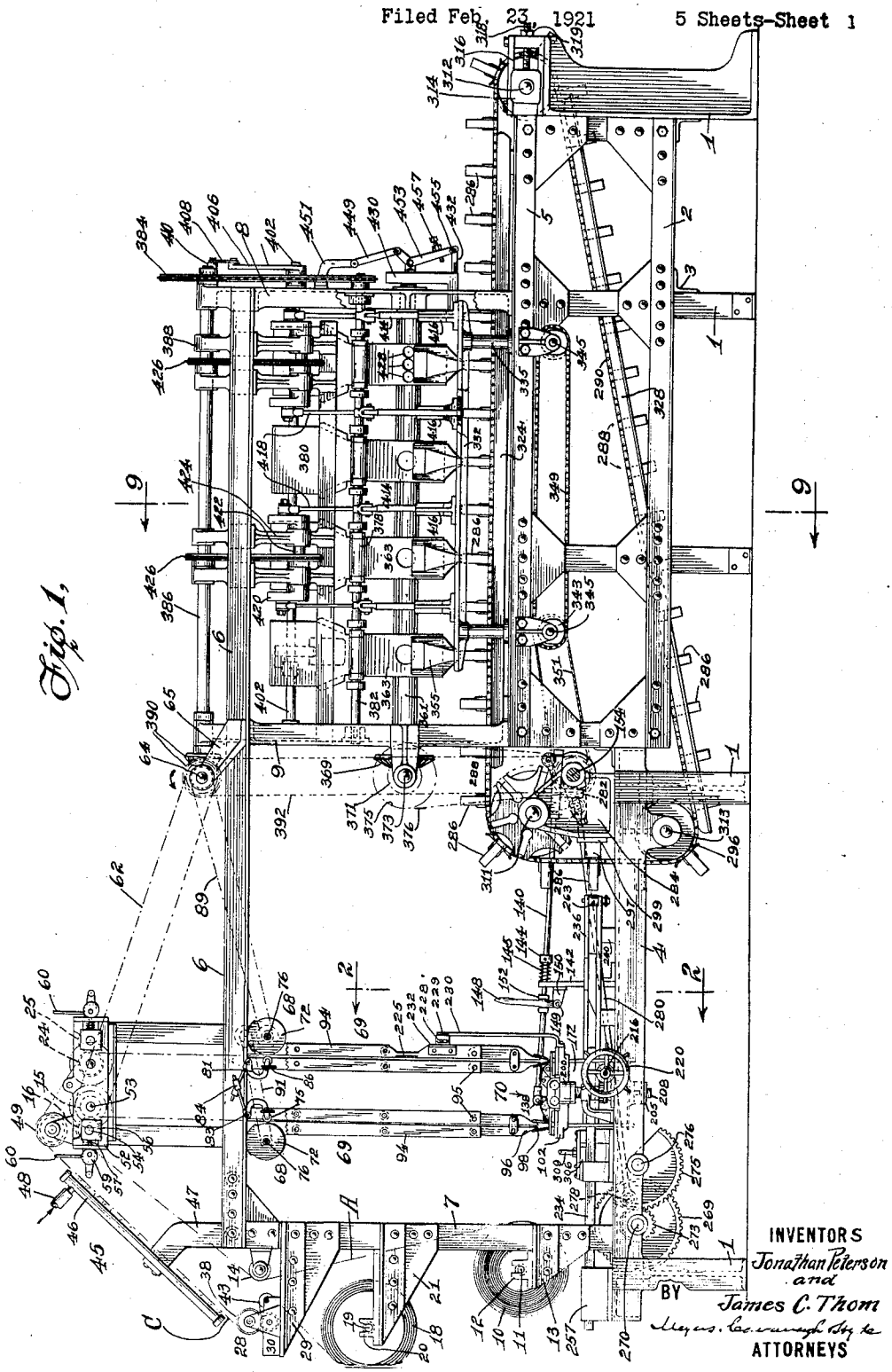


Fig. 1.

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Fig. 2,

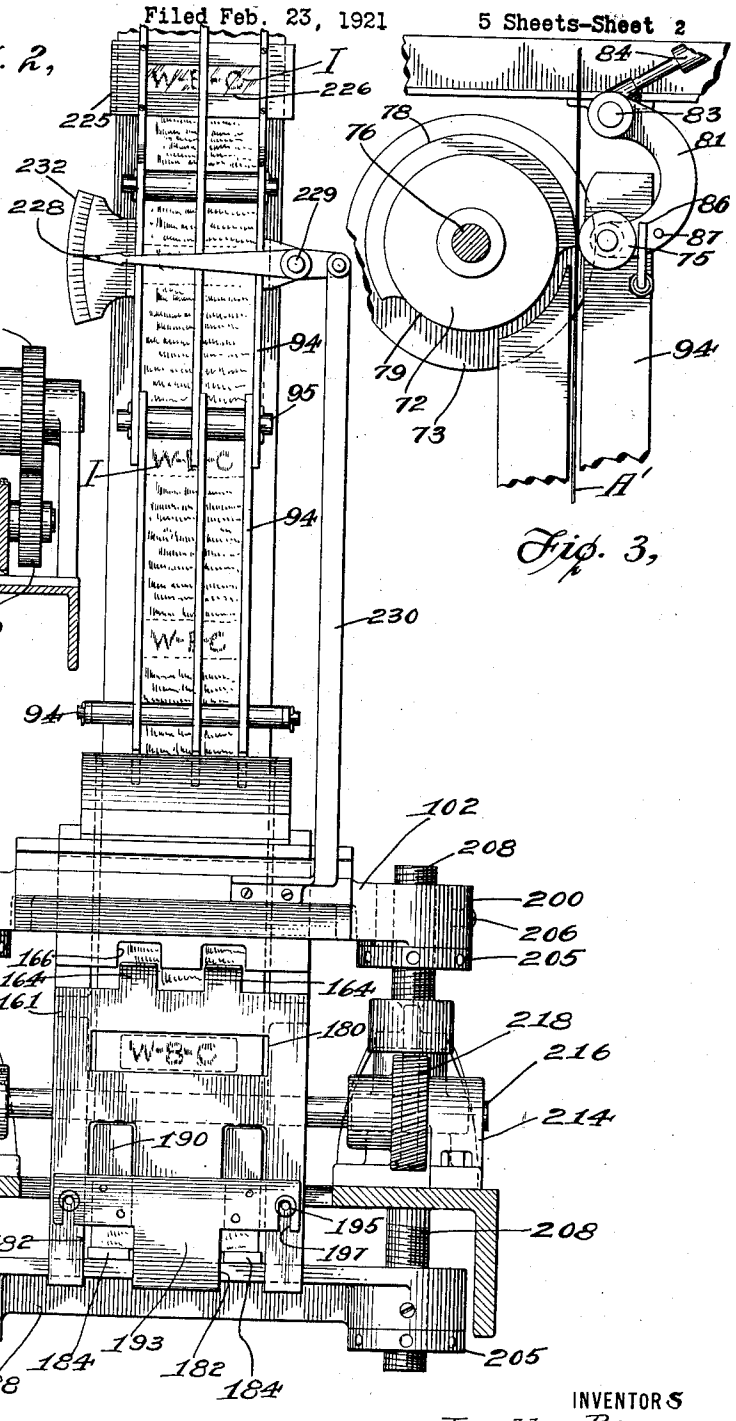


Fig. 4,

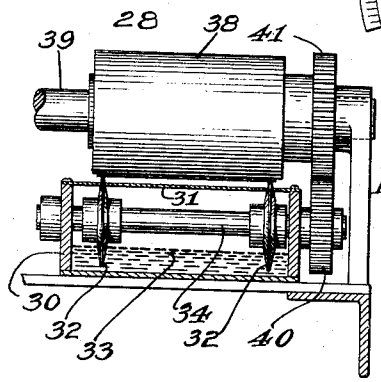


Fig. 3,

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5 Sheets-Sheet 3

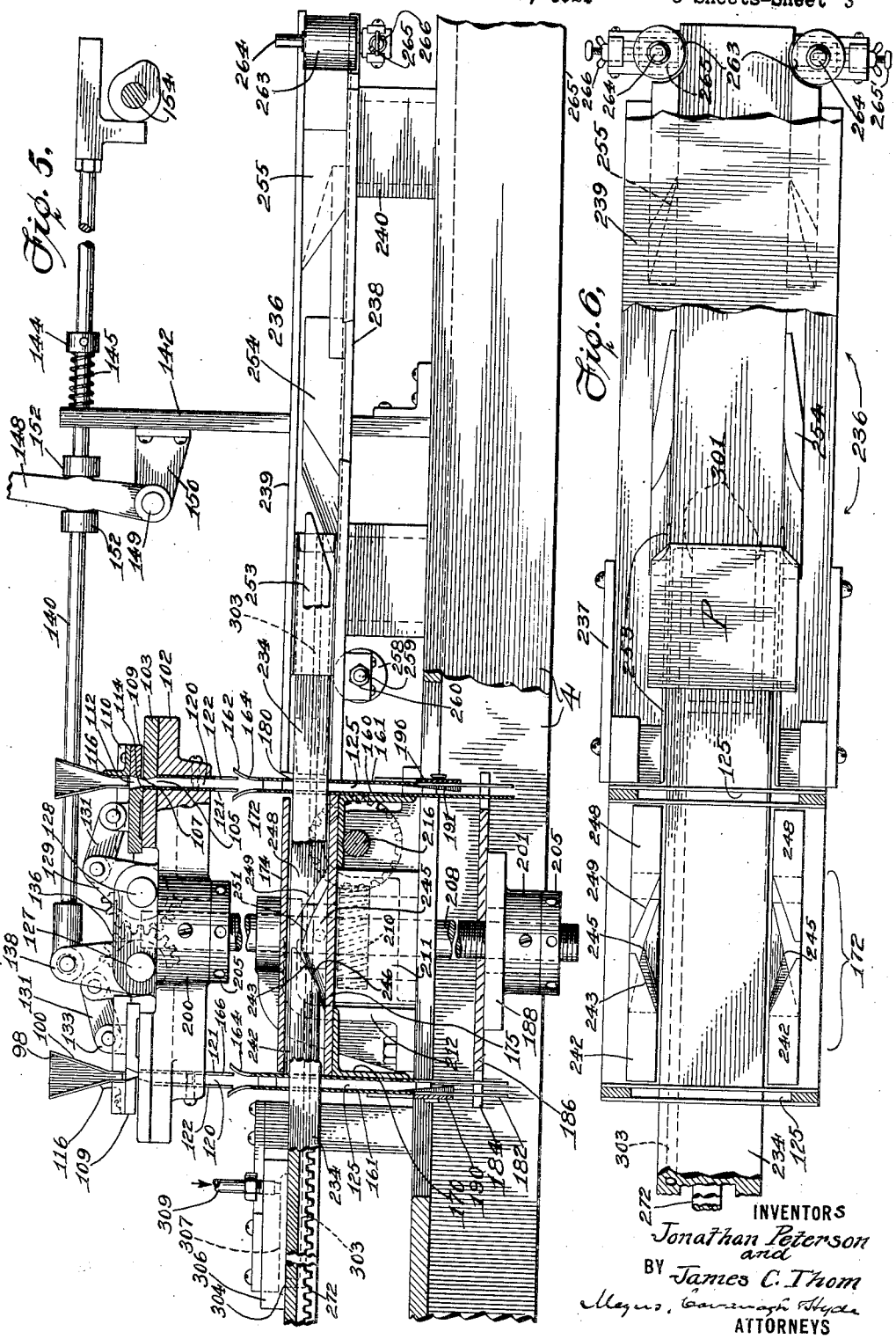


Fig. 5.

Fig. 6.

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5 Sheets-Sheet 4

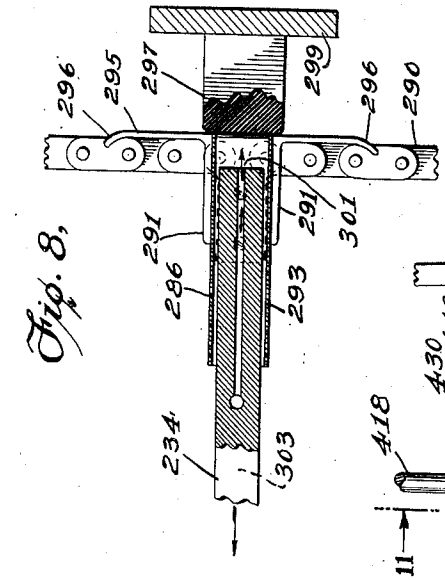


Fig. 8,

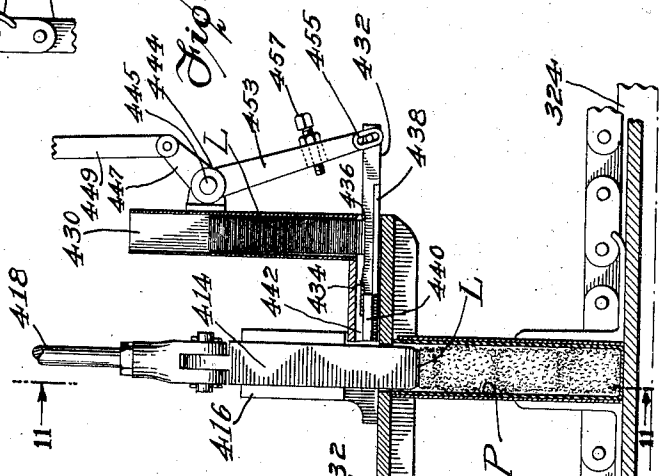


Fig. 10,

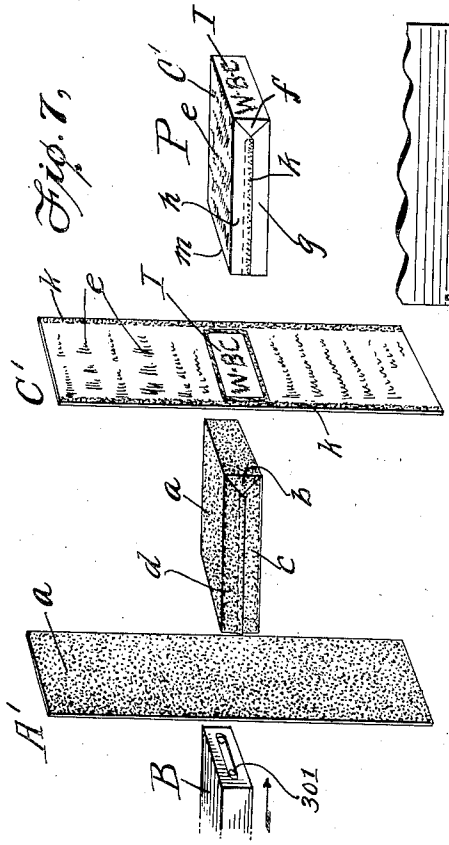


Fig. 7,

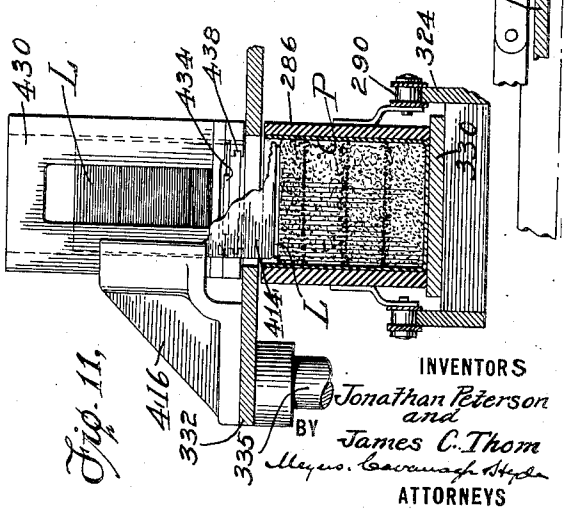


Fig. 11,

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Fig. 9,

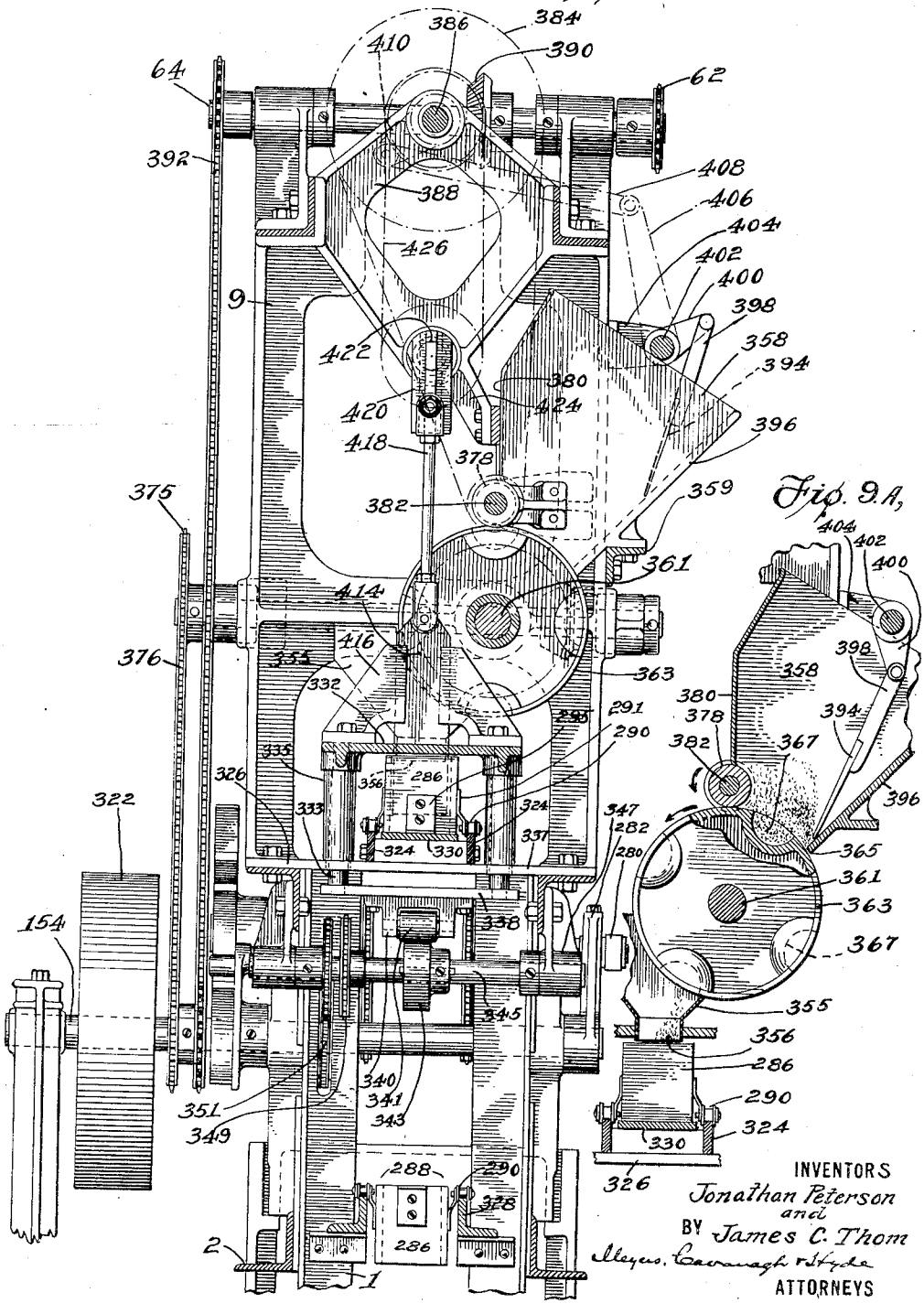


Fig. 9A,

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Patented Apr. 14, 1925. 1,533,455

UNITED STATES PATENT OFFICE.

JONATHAN PETERSON, OF BROOKLYN, NEW YORK, AND JAMES C. THOM, OF CHICAGO, ILLINOIS, ASSIGNORS TO COMBINATION MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PACKAGING MECHANISM.

Application filed February 23, 1921. Serial No. 447,151.

To all whom it may concern:

Be it known that we, JONATHAN PETERSON and JAMES C. THOM, citizens of the United States, and residents of Brooklyn and Chicago, respectively, in the counties of Kings and Cook and States of New York and Illinois, respectively, have invented certain new and useful Improvements in Packaging Mechanism, of which the following is a specification.

Our invention relates to machines especially adapted for packaging tobacco, such as granulated, fine cut or "cut plug" tobacco, and also for packaging other commodities capable of being handled in a similar way, or which it is desired to package in a similar manner.

The complete invention provides means for forming suitable containers and for filling them, and both the container forming and the filling mechanisms have novel features of value in themselves as well as in combination.

While the invention is in many respects not limited to specific package forms, it is adapted in the specific form here shown to produce pouch packages of the kind described in a prior application of Jonathan Peterson, Serial No. 300,360, filed May 28, 1919, for containers and method of producing same, and to fill such containers with suitable tobacco products. To this end the invention comprises, in the present embodiment, as briefly described, means for feeding continuous strips of pouch material, each strip having one surface coated with cementitious or adhesive material, applying additional adhesive stripes to marginal portions of one of the strips, cutting off portions of each strip, and forming the two corresponding portions of different strips successively over a plunger to produce a pouch, advancing the pouches successively to a conveyor, depositing successive partial charges of tobacco in each pouch, pressing down each charge, and finally placing a card or ticket in each pouch on top of its contents.

The cementitious coating of the pouch material preferably utilized in the present machine is of such a character that two such surfaces readily adhere together to form a composite pouch wall; but these surfaces are practically free from adhesive qualities when applied to any other materials with which they are likely to come in contact in the process of pouch formation. For instance, these surfaces will not appreciably adhere to ordinary paper surfaces, or to metal parts. The cementitious surfaces are produced upon the strips of material before utilization in the machine. It is therefore possible in a properly adapted machine, as in the present instance, to practically do away with gumming apparatus in the machine itself, and also to avoid difficulties incident to the manipulation in the machine of glued or other adhesively coated surfaces, which readily adhere to other paper surfaces or to machine parts. The present mechanism takes full advantage of the described qualities of the cementitious coatings, both in the simplification of the machine structure, and in the acceleration of production and freedom from difficulties caused by improperly formed pouches or pieces of the material sticking to parts of the machine and other similar difficulties arising where ordinary adhesive is present.

The strip of pouch material which forms the outer member of the composite pouch is desirably imprinted on its outer face with suitable identifying advertising or other subject matter, these imprints being repeated at intervals corresponding substantially to the length of individual blanks to be cut from the strip; and the invention therefore provides means for maintaining the "registration" of the successive printed blank sections with the blank forming mechanism; this registration mechanism comprising more specifically in the present embodiment, means for controlling the main feed of the printed strip (and desirably of both strips), secondary feed mechanism, suitable registration indicators, and means for adjusting the cutting devices and usually also certain other parts, to secure and maintain blank registration.

The invention also comprises many other novel and important features which are best understood in the following detail description of the representative embodiment shown in the accompanying drawings. The principles of the invention are sufficiently explained in the detail description, and persons skilled in the art will understand that

many variations may be made in details as well as in combinations and sub-combinations of parts, and we contemplate the employment of any structures that are properly within the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevation of a complete machine embodying the invention.

Fig. 2 is an enlarged vertical section at 2—2, Fig. 1.

Fig. 3 is an enlarged detail of the secondary strip feed mechanism.

Fig. 4 is an enlarged detail of adhesive applying mechanism.

Fig. 5 is a large scale view, partly in front elevation and partly in section, showing mainly strip cutting, positioning, and pouch forming mechanism.

Fig. 6 is a top plan of the same, with some parts removed.

Fig. 7 shows the pouch material in different formation stages, and a complete pouch.

Fig. 8 is an enlarged detail of the forming plunger in operative relation to the filling conveyor.

Fig. 9 is an enlarged section at 9—9, Fig. 1, showing filling mechanism.

Fig. 9ª is a sectional detail of one partial filling device.

Fig. 10 is a longitudinal section of adjacent filling and pressing devices, and of the label-inserting device.

Fig. 11 is a section at 11—11, Fig. 10.

The main frame comprises legs 1, parallel longitudinal members 2 connected by cross pieces 3, other parallel longitudinal members 4, suitably connected, other parallel longitudinal members 5 suitably connected, upper parallel longitudinal members 6 connected by suitable cross members and supported at one end of the machine by uprights 7, at the other end by uprights 8, and intermediately by uprights 9. The forward section of the machine, to the left of uprights 9 in Fig. 1, comprises the mechanism for feeding the strips of pouch material and forming the pouches.

Fig. 7 shows two blanks A′ and C′ of pouch material, usually paper of suitable quality and thickness successively folded and associated to produce pouch P. An oblong blank A′ is usually coated on one side with paraffin and on the other side, visible in the figure, with suitable cementitious or adhesive material *a*. Particularly this may be a rubber composition, of such a nature that when the strip of paper is coated and rolled it will remain somewhat soft and "tacky," and will retain its adhesive quality when the strip is unrolled and cut into blanks for pouch formation. A plunger B is brought against the center of blank A′ and the blank is folded about the plunger with the cemented surface outward, the blank being formed in the folding process with end folds *b* and side flaps *c* and *d*, the last named flap overlying the margin of flap *c*. The inner pouch member thus formed has its entire external surface provided with the cementitious coating *a*. The other blank C′ is then applied over blank A′. The second blank has the surface which is concealed in Fig. 7 coated with cementitious material similar to the coating *a* and has its other surface, which is to be the external surface of the complete pouch, imprinted with suitable indicia or advertising matter *e* including desirably a particular portion I which is to be used for index or registry purposes as later explained. This blank is folded upon the inner blank in substantially the same manner, that is, by producing end tucks or folds *f* and side flaps *g* and *h* and all of the inward surfaces of the blank C′ adhere firmly to the inner blank except under the overlapped margin of flap *h*. To provide for securing these margins, stripes of adhesive *k* may be placed along the longitudinal margins of the outer surface of blank C′ and when the blank is folded the adhesive stripes on the margins of flaps *g* secure the overlying margins of flap *h*. There is thus produced a rectangular pouch P having an open end at *m* and consisting at every point of at least two layers of paper with an interlining of substantially moisture-proof material, which retains its flexibility after drying. The outer surface of the package also has suitable printed matter *e* and desirably the portion I of this appears on the closed end (bottom) of the pouch. My above identified application should be referred to for further description of characteristics of the pouch and the general method of making it.

A continuous strip of blank material A (Fig. 1) is provided in the form of a roll 10, on a shaft 11, resting in socket bearings 12 carried by brackets 13 on uprights 7. From the roll the strip A passes over a guide roll 14 and between feed rolls 15 and 16. A continuous strip of blank material C is provided in the form of a roll 18 carried by a shaft 19 resting in socket bearings 20 supported by brackets 21 on uprights 7. After application of adhesive stripes *k* strip C is guided between feed rolls 24 and 25. The adhesive surfaces of the strips A and C are so arranged that they always confront each other during the feed movements of the strips.

Suitable mechanism 28 supported on brackets 29 is provided for applying the adhesive stripes *k*. This comprises as shown in Fig. 4, an adhesive reservoir 30 having a cover 31 slotted to accommodate two applying wheels 32 which dip into the adhesive 33 and are carried by a shaft 34 mounted in bearings in side walls of the reservoir. Opposed to wheels 32 is an abutment roll mounted on a shaft 39. Shafts 34 and 39

may be connected to revolve together by gears 40, 41, and shaft 39 may be positively driven in any convenient manner or the rolls may be driven merely by contact with the strip. Strip C passes first over a guide roll 43 and then under roll 38 and in contact with wheels 32, which apply a stripe of adhesive *k* to each outer surface margin of the strip. The adhesive may desirably be cementitious material similar to the coating employed for the main inward surfaces of the strips, that is, a rubber composition kept properly fluid for application by a suitable ingredient such as benzine or other solvent. After receiving the adhesive stripes the adhesive is desirably dried somewhat by a suitable device 45, in which jets of air are supplied from perforated air tubes 46 supported by brackets 47 and supplied with air from any suitable source through pipes 48. Strip C is moved with its outer surface margins close to the rows of air jets, which sufficiently dry the adhesive stripes as they pass. Strip C now goes over a guide roll 49 to its main feed rolls 24 and 25.

The main feed rolls 15, 16 and 24, 25 are carried by housing or frame 52 located above longitudinal frame members 6. Of each pair of main feed rolls, one roll such as roll 15 is carried by a shaft 53 mounted in fixed bearings and the other roll, 16, is carried by a shaft 54 mounted in movable bearing blocks 56 acted upon by springs 57 to bring roll 16 into driving engagement with roll 15 and the movable roll may be retracted by suitable means such as a cam 59 provided with a handle 60. In this way the feed of either strip may be quickly discontinued when desired by moving the appropriate handle. The main feed devices are positively driven in any convenient manner, in the present instance by connecting the shafts of rolls 15 and 24 together by suitable gears, and by connecting one of the shafts, such as shaft 53, by sprockets and a chain 62 with a shaft 64 mounted in bearings on brackets 65, secured to frame members 6.

Each blank strip is now conducted through suitable secondary or auxiliary feeding mechanism 68 and through suitable guides 69 to cutting off and blank positioning devices at 70, Fig. 1. The auxiliary feed and cutting off mechanisms for each strip are substantially identical, and the guide structures are substantially identical except for certain features later mentioned. The secondary feed mechanism 68 for each strip comprises (Figs. 1 and 3) a main roll 72 having flanges 73 to guide the strip, and a small co-operating roll 75. The main roll is carried by a shaft 76 and has a part-circular strip-engaging tread portion 78 and a part-circular portion 79 of smaller radius. The co-operating roll 75 has a cylindrical surface and is carried by arms 81 pivoted at 83 and provided with a counterweight 84 angularly arranged to urge roll 75 toward roll 72. Co-operating stops 86 and 87 are provided to limit the inward movement of roll 75. Both of the large auxiliary feed rolls 72 are positively driven, for example by sprockets and a chain 89 connecting one of the roll shafts 76 with shaft 64 previously mentioned, and by gears, sprockets and a chain 91 connecting the two shafts 76 together. The circumferential length of enlarged roll tread portions 78 correspond to the desired length of the blank. Evidently therefore at each rotation of one of the large rolls a feed engagement with the corresponding strip is effected by that roll and its co-operating roll 75, and the strip is advanced one blank-length. The main feed rolls are usually driven at such a rate that some slack is maintained in the strips between them and the auxiliary feed mechanism, and at each auxiliary feed action some or all of this slack is taken up. Either auxiliary feed may be discontinued by raising its counterweight 84, and when desired, controlling devices convenient to the operator may be provided for this purpose. Similarly, connections may lead from cams 59 of the main feed devices to control levers at points convenient to the operator, who is usually placed at the near side of the machine as viewed in Fig. 1, near the vertically moving parallel blank strips.

After passing the auxiliary feed mechanism each blank strip passes through guides 69, each comprising two parallel, spaced walls consisting of thin strips 94 arranged in edgewise relation to the blank strip at each side thereof, the different strips or links being connected by transverse rods 95. The upper ends of the guides may be supported on frame members 6. This openwork guide arrangement permits the strips to be observed during their travel, and especially permits the printed surface of strip C to be observed. The lower ends 96 of the lower strips 94 are reduced in width and located loosely within the flared upper ends 98 of guides 100 which direct the strips to the cutting off mechanism, Figs. 1, 2 and 5.

This mechanism comprises a main plate 102 carrying fixed cutter plates 103 each provided with a slot 105 having a cutting edge 107. A movable cutting plate 109 is slidably mounted on each fixed cutting plate and is suitably guided, for instance, by gibs 110. Each movable cutting plate has a slot 112 provided with a cutting edge 114. Strip guides 100 are connected to lugs 116 secured to the movable cutter plates, and their narrow lower ends direct the strips to slots 105 and 112. Main plate 102 is apertured to provide guides 120, consisting of members 121 and 122, to conduct the severed blanks to lower positioning guides 125. Plate 102

provides bearings for shafts 127 and 128, each of which has an arm 129 connected by a link 131 to a slotted lug 133 on one of the movable cutter plates. The shafts are connected together by segment gears 136. Shaft 127 also has an arm 138 connected to any suitable driving device. In the present instance the connection is in the form of a rod passing through a guide hole in the upper end of an upright 142, and is provided with an adjustable collar 144 and a spring 145 compressed between the collar and the upright to retract the rod and the cutting mechanism. The rod may be actuated in any suitable way so that it is reciprocated at intervals corresponding to feed of the individual pouch blanks and the operating mechanism may desirably be so arranged that the operator may at any time discontinue the cutting operation. For this purpose a lever 148 is provided, fulcrumed at 149 on a bracket 150 and engaging between collars 152 on rod 140. By moving the lever the operator may compress spring 145 and hold the cutting mechanism out of action, or may cut off blanks when the machine is not running. The rod may be driven by a cam or other suitable connection with main drive shaft 154, later referred to, or other driving arrangements for the cutting mechanism may be provided.

Below the cutting mechanism, the two blank positioning channels 125 are provided, each comprising parallel plates 160 and 161, having their upper ends 162 divergently flared to receive blanks from the lower ends of guides 120; and flared portions 162 may also consist of spaced members 164 of reduced width, co-operating with slots 166 in guide members 121 and 122 to permit ample relative vertical movement of the guides. The positioning channels 125 are carried by transverse angle bars 170 supported on longitudinal frame members 4. These angle bars also support a short forward section 172 of a longitudinal pouch forming channel, this short section consisting of a top plate 174, bottom plate 175 and side plates 176. Positioning channel 125 for blanks A′ is located at the entrance of this forming channel section and positioning channel 125 for blanks C′ is at the rear end of the channel. Plates 160 and 161 have apertures 180 in line with the folding channel to permit passage of the forming plunger and associated blanks. The lower ends of plates 160 and 161 are provided with vertical slots 182 and in these slots are arranged blank-supporting projections 184 formed on a plate 186 carried by a lower supporting and blank adjusting member 188. Plates 161 are provided with blank engaging devices 190, also located in slots 182, having angular faces 191, which hold the respective blanks near one wall 160 of their positioning channels. Members 190 are connected to cross pieces 193, movably secured to plates 161 by pins 195 and slots 197.

Adjusting member 188, and main plate 102 of the cutting mechanism are supported and connected together for simultaneous vertical adjustment as follows: Each of these members has at each side of the machine a short sleeve 200 accommodating a rotatable sleeve nut 201 which may be rotated by means of holes 203 bored in its flanged end 205, and secured in adjusted position by a set screw 206. At each side of the machine a vertical screw shaft 208 is arranged to pass through the sleeve nuts at that side of plate 102 and member 188. Each of these screw shafts is threaded at each end, the screw threads at one end being right-handed and at the other end left-handed, and the nuts being threaded correspondingly. Each screw shaft carries a spiral gear 210 held against end movement by the jaws 211 of supporting yokes 212 secured to longitudinal frame members 4, the yoke jaws being also apertured to provide bearings for the screw shaft above and below the spiral gear. Transversely arranged in bearings in lugs 214 secured to frame members 4 is a shaft 216, provided with spiral gears 218, one engaging with each of the spiral gears 210. At the front of the machine, convenient to the operator, shaft 216 is provided with a hand wheel 220.

The positions of top plate 102 carrying the cutting mechanism, and of cross piece 188 carrying the stop plate to support the pouch blanks in front of the plunger, may be initially adjusted by rotating sleeve nuts 201 and securing them by their set screws 206. The positions of both of these members may then be quickly adjusted simultaneously from time to time as may be required in the operation of the machine by rotating the hand wheel. When this is turned in one direction the plates are brought nearer together, with the same amount of movement in relation to the line of plunger travel; and when the wheel is turned in the other direction the plates are moved apart in a similar way. There is thus provided means for quickly adjusting the point at which blanks are cut from the advancing strips, in accordance with any variation in the rate of strip feed or variations in the spacing of the printed matter occurring repetitiously on the outer surface of strip C, or for other reasons. At the same time, the position of stop plate 186 is correspondingly altered, so that the cut-off blanks are properly centered in front of the advancing plunger.

It is desirable to provide especially convenient means to enable the operator to properly adjust the strip-feeding and blank-handling mechanism. Such means is exem-

plified in the present case as follows: At a suitable point on one of the blank strip guides, and most desirably at the rear of the guide for blank strip C, a suitable index device is arranged and conveniently this is in the form of a plate 225 (Fig. 2), secured to guide members 94 and provided with an aperture 226 substantially corresponding with the dimensions of the special index subject-matter I printed on the adjacent face of the strip, as explained in connection with Fig. 7. The aperture in the plate provides, practically, a window through which the index matter may be observed and the index is positioned so that when the feed mechanism is operating properly, the index matter I is centered in the window at the end of each feed movement. If for any reason the index subject matter commences to get out of registry with the window, the feed may be adjusted to restore registration, by manipulating levers 60 to control the main strip feed, or by manipulating the levers which carry counterweights 84 to regulate the secondary or intermittent strip feed. In this way the successive blanks will be brought back to the proper center relation to the index window.

The blank cutting and positioning mechanism is also desirably connected with a suitable indicating device exemplified in the present case by a pointer 228, pivoted at 229 and connected to main plate 102 of the cutting mechanism by a link 230. The free end of the pointer moves over a calibrated sector 232. Normally the operator will move hand wheel 220 to maintain the pointer at the center of its scale, this corresponding to the properly registered position of the index subject matter I, as shown in Fig. 2. If, however, the advancing strip gets out of registry the hand wheel may be properly moved to adjust the blank cut-off mechanism in either direction in accordance with retardation or acceleration of the strip movement, and under all conditions the blanks which are cut off are properly centered in respect to the center line of the pouch forming channel. Any variation in length of the blank cut from one strip is accompanied by a corresponding variation in length of the other blank so that the blanks are always of the same length and properly formed pouches will be produced regardless of moderate variations in the length of the blank. The pointer affords an easy means for observing the position of the blank handling mechanism and also for noting the amount of adjustment that is effected in either direction. Either of the described devices, that is the registration index device or the adjustment indicating pointer, or their equivalents, may be used in some cases without the other.

It will be understood that the index window shows the position of the advancing strip, by observation of a definite part of each printed strip behind the window; and the pointer 228 indicates readily to the operator the momentary position of the cutters and the blank supporting or positioning plate 188. If the blank feed has varied so much that a considerable adjustment of the cutters and supporting plate has had to be made, that will be evident by the positioning of the pointer 228 near one end of its scale, and the operator may then take steps to properly correct the strip feed. The supporting or positioning plate and the cutters may then be repositioned, and the pointer will incidentally be brought back to normal or approximately central position.

The pouch forming plunger, consisting substantially of a long bar 234 of rectangular cross section, is arranged to reciprocate through the short forming channel 172 and a long forming channel 236 arranged in line with the short channel and with its forward end just to the rear of the rear blank positioning channel 125. The long forming channel comprises side plates 237, a bottom plate 238 and a top plate 239, and is supported by suitable cross pieces 240 resting on longitudinal frame members 4. At the front end of the short forming channel a blank end folding block 242 is arranged at each side, the front ends of these blocks serving to fold in the end portions of blanks A′ against the sides of the plunger, producing end folds *b* (Fig. 7). Spaces between the upper and lower surfaces of these blocks and the top and bottom plates respectively, accommodate projecting side flaps *c* and *d* of the blank. The rear ends of blocks 242 are provided with upwardly beveled faces 243 and spaced slightly to the rear of these are folding blocks 245 located on bottom plate 175, these blocks having angular faces 246 which fold side flaps *c* up against the sides of the plunger in co-operation with the beveled faces 243 of blocks 242. To the rear of blocks 245 other folding blocks 248 are arranged at the sides of the channel, and these have angular faces 249 co-operating with the rearward faces 251 of blocks 245 to fold side flaps *d* down against the sides of the plunger and over the margins of flaps *c*. The plunger with its advancing end covered by the formed blank A′, then engages the center of blank C′ and moves the combined blanks through the long forming channel, in which folding blocks 253, 254 and 255 are located, and which perform substantially the same functions with respect to the outer blank as were performed upon the inner blank in the short channel. The plunger is supported and guided in its movement by the top and bottom walls of the channels and by the inner faces of the folding blocks, and may be

also additionally supported and guided by other suitable means such as a guide member 257 through which the forward end of the plunger moves as shown in Fig. 1. As the pouch covered plunger advances through the long channel the plunger may be additionally supported by a roller 258 acting through an aperture in bottom plate 238 and provided with a shaft 259 carried in bearings 260; and after the outer blank is completely folded, its sides may be pressed against the plunger by rollers 263 located at the sides of the channel; and the shafts 264 of these rollers are desirably carried by movable bearing members 265, adjusted by screws 265' provided with lock nuts 266 so that the pressure of the rollers on the pouch sides may be regulated.

The plunger is reciprocated by suitable means, such as multiplying gearing, comprising a large gear 269 journalled at 270 in frame members 4 and engaging rack teeth 272 on the under face of the plunger. Gear 269 is provided with a pinion 272 and this is engaged by a large segment gear 275 journalled at 276 on frame members 4. The segment gear has a crank pin 278 connected by a pitman 280 to a crank arm 282 on shaft 154 previously mentioned, which is mounted in bearings in brackets 284 resting on frame members 4. The connection of pitman 280 with crank 282 may be an adjustable connection of any suitable form to vary the travel of the segment gear and so to adjust the stroke of the plunger.

At the end of each advance movement of the plunger it delivers its pouch to a pouch holder 286 which is one of a series of regularly spaced holders carried by a conveyor 288, intermittently driven to move a succession of pouches for the filling operations. The conveyor comprises a pair of parallel chains 290, to opposite links of which are connected plates 291, and to these plates are connected the pouch holders, each of which comprises a pair of plates 293 spaced apart to receive the pouch and shoes 295 extending rorward and rearward from the plates in the direction of movement of the conveyor and substantially flush with the open bottom of the holder, the ends of these shoes being outwardly curved as at 296. As the pouch-covered end of the plunger emerges from the long forming channel, it is in line with one of the pouch holders carried by ascending stretches of the conveyor chains; and the open bottom of the holder is confronted by an abutment consisting of a rubber block 297 carried by a stationary frame piece 299.

At each advanced movement of the plunger it encounters successively inner and outer blanks positioned in the vertical channels, and carries these blanks forward and folds them successively. and the adhesive inner surfaces of the blanks are pressed together and marginal portions of the outer blank carrying the adhesive stripes *k* are suitably pressed together, and at the end of its advance movement the pouch emerges from the long channel and passes into a properly positioned holder and the bottom of the pouch is pressed by the plunger against the abutment block. The plunger is then withdrawn and the pouch may be retained in the holder by frictional engagement with its walls; but other or additional means and desirably provided for discharging the pouch, consisting in the present case of one or more air passages 301 bored longitudinally in the forward end of the plunger and connected to a long air passage 303 terminating in a port 304 in the upper surface of the plunger (Fig. 5). The upper surface of the plunger at the left of the short forming channel is closely engaged by a block 306 having in its engaging face an air channel 307 in line with port 304. Air is supplied to the channel under pressure from any suitable source by a pipe 309. At about the time the advancing end of the plunger positions the pouch in the holder, port 304 comes into communication with air channel 307 and air is thus ejected into the pouch through apertures 301, and the pouch is practically blown off the end of the plunger as the latter retreats. The described cycle of operations is repeated to supply to each successive holder of the conveyor.

The conveyor chains run over pairs of sprockets carried by shafts 311, 312 and 313, supported in suitable bearings on different frame members, bearing blocks 314 for shafts 312 being desirably mounted in guides 316 at the rear end of the frame and provided with adjusting screws 318 and nuts 319 for properly tensioning the conveyor. One of the conveyor shafts such as shaft 311 is intermittently driven from shaft 154 previously mentioned, by any suitable intermittent driving mechanism, such as the Geneva wheel and stud carried by shafts 311 and 154, respectively. Shaft 154 may be the main drive shaft of the entire machine, and for that purpose is provided with a driving pulley 322. The upper stretches of the conveyor chains are desirably guided and supported by rails 324 carried by frame cross members 326, these rails engaging the chain blocks between the side links and the lower stretches of the chains may be similarly supported and guided by rails 328. Between rails 324 a longitudinal plate 330 is supported which underlies the open bottoms of holders 286 throughout the extent of the different filling and pressing positions, to support the pouches within the holders.

Between frame uprights 8 and 9, a vertically movable table 332 is located just

above the upper ends of the advancing row of pouch holders. This table is carried by vertical rods 333 passing through sleeves 335 resting on frame cross members 337; and the lower ends of the pairs of rods are connected by cross pieces 338. Each cross piece is provided on the bottom with a slotted lug 340 carrying a rotatable cam roller 341, and each roller is engaged by a cam 343 mounted on a transverse shaft 345 carried by bearings 347 below frame members 5. Shafts 345 are connected by sprockets and a chain 349 and the forward shaft 345 is connected by sprockets and a chain 351 to main drive shaft 154. Table 332 carries a row of feed chutes 355, four in the present instance, and each chute has a spout 356 of a size approximating the interior contour of the open end of the pouch, this spout passing through an aperture in the plate. Above and somewhat to one side of each charging chute is a tobacco hopper 358, these being supported by a longitudinal frame member 359. A shaft 361 supported in bearings in frame uprights 8 and 9, runs between the hoppers and chutes and carries charge transfer wheels 363, one for each hopper and chute. Each wheel is arranged so that an upper surface runs close to the discharge opening 365 of a hopper, and a lower surface is adjacent to the upper end of the corresponding chute. In the surface of each transfer wheel is a series of equally spaced tobacco pockets 367. Shaft 361 is driven by a bevel gear 369 at its forward end, engaging a bevel pinion 371 on a transverse shaft 373, which is connected by sprockets 375 and a chain 376 to main drive shaft 154, or another suitable driving member. A charge controlling roll 378 is arranged to run close to or engage the periphery of each transfer wheel substantially at the top thereof, and these rolls are accommodated by suitable formation of hopper walls 380. Rolls 378 are carried on a shaft 382 mounted in bearings in frame uprights 8 and 9, and are driven in the same direction as shaft 361, so that the surfaces of the charge controlling rolls in engagement with the transfer wheels move in a reverse direction, that is, back toward the hoppers, to move back any surplus amount of tobacco and prevent the transfer of an excessive amount of tobacco in any one charge. The shaft 382 is driven by sprockets and a chain 384 from a longitudinal overhead shaft 386 carried in bearings 388, and itself driven from shaft 64 by bevel gears 390. The shaft last mentioned is driven by sprockets and a chain 392 from main drive shaft 154.

In each tobacco hopper a stirring or agitating device is provided to insure a proper movement of the tobacco and filling of the transfer pockets. Each of these devices consists in the present instance of a stirring or pushing blade 394, the free end of which is arranged to slide against the inclined wall 396 of the hopper, and carried by an arm 398, pivoted to a crank 400 on a longitudinal shaft 402, mounted in bearings 404. At one end this shaft has another crank arm 406 connected by a pitman 408 with a crank 410 on the adjacent end of overhead shaft 386. In this way the stirrer shaft 402 is continuously oscillated and the agitator blades are moved up and down to push the contents of the hoppers toward the pockets.

To the rear of each filling device is a charge compressing device comprising a plunger 414 movably arranged in guides 416 carried by table 332 and passing through an aperture in the table, the plunger being formed to fit with suitable clearance within the pouch. Each plunger is connected to a link 418, and each link is connected adjustably to a crank arm 420, so that by adjusting the connection toward and from the crank rotation center the stroke of the corresponding plunger may be varied. The driving cranks 420 are arranged in pairs on the ends of short shafts 422 carried in bearings 424 on brackets depending from frame members 6, and each of these crank shafts is driven by sprockets and a chain 426 from overhead shaft 386.

While the machine can easily be arranged so that each pouch is entirely filled by one suitable filling device, for instance by making the transfer pockets of sufficient size to carry an entire charge, or rotating a single transfer wheel at such speed that a plurality of small charges will be delivered to the pouch in one conveyor position, and in such cases a single compresser would suffice, it is preferred, as herein shown, to fill each pouch with a plurality of relatively small charges and to compress each charge separately. Consequently the first compressing plunger must descend relatively near to the bottom of the pouch, and the second will not descend so far, and so on to the rear plunger, which descends only a short distance into the pouch. The adjustment of the links 418 above described is provided to enable the strokes of the compression plungers to be conveniently varied for the purpose stated.

It is desirable in some cases, as here shown, to arrange the last charging device in the series so that a smaller charge may be inserted in the pouch than at previous positions, or so that the charge supplied here may be varied as may be necessary or desirable. For this purpose instead of a single transfer pocket at each point on the rear transfer wheel, the periphery of this wheel is desirably provided with equally spaced series of small pockets 428, for instance, three of these pockets in a row, with these rows equally spaced about the wheel perim-

eter. A part of the open discharge end of the corresponding hopper may be blocked off by inserting a suitable plate, or in other convenient ways tobacco may be prevented from entering any one or more of the transfer pockets of each series and in this way the amount of the last charge may be readily varied.

It is desirable in many cases to insert in each pouch on top of the contents a card or ticket. For this purpose a vertical holder 430 for a stack of cards or labels L is supported on table 332 rearward of the last compression plunger. A slide 432 moves under the card stack and the upper face of this slide is provided with two card engaging shoulders 434 and 436. The slide has lateral flanges 438 co-operating with guide members 440 at opposite sides of the slide and the upper surfaces of these guide members provide supports 442 for the ends of the cards in intermediate positions during retreat of the slide. The slide is operated by a bell crank 444 fulcrumed at 445 on the rear wall of the card holder. Short arm 447 of the bell crank is connected by a link 449 to a stationary bracket 451; and the long arm 453 of the bell crank is connected by a pin and slot connection 455 to the outward end of the slide. An adjustable stop may also be provided in the form of a screw 457 carried by bell crank arm 453, to limit advance movement of the slide. At each upward movement of table 332, the bell crank acts just after the adjacent compression plunger has been withdrawn, and a filled pouch has been brought into position under the plunger, to advance a card and drop in through the table aperture into the pouch; and at the same time the rearmost shoulder 436 of the slide engages the under card of the stack and moves it to an intermediate position where it rests on guide blocks 442; in the descending movement of the plate the slide is retracted and the rearmost shoulder is ready to engage another card and feed it from the stack while the foremost shoulder 434 is ready to engage the intermediately positioned card and move it forward for deposit in the pouch at the next upward movement of the table, and so on.

The vertical center axis of the filling spouts 356 and plungers 414 are spaced equally apart so that equal movements of the pouch conveyor from the first filling position move a pouch successively to the next compressing position, then to the next filling position, and so on, each pouch thus occupying eight active positions in the filling mechanism.

Before the conveyor commences each movement table 332 is raised, retracting the filling spouts from the pouches. The conveyor then shifts the pouches, table 332 descends, inserting each filling spout in a pouch opening; a partial charge is deposited in each pouch by the charging mechanism and at the same time the charge is compressed in each pressing position by one of the plungers. The manner in which the cards are inserted has been sufficiently described. The filled pouches may be delivered to suitable closing mechanism, or may be removed by hand and disposed of in any desired way.

We have described mechanism for associating two pieces of pouch material to form each of the pouches; but evidently by obvious omissions and dimensional changes, or other simple changes, the mechanism may be adapted to form pouches which consist of a single piece of blank of suitable material.

It will be understood from the previous description that the complete invention comprises, among other important features, means for automatically forming pouches of the general character described, and means for automatically filling them. It also comprises means for feeding continuous strips of pouch material, cutting blanks from the strips, and associating the blanks to form composite pouches. It also comprises strip feed controlling and adjusting mechanism. It also comprises, as an important feature, means for properly controlling the supply of a continuous strip of pouch material having a repetitious imprint, and controlling the registration of this strip in relation to pouch forming mechanism, and also for controlling and regulating the positioning of individual printed blanks cut from the continuous strip. It also comprises new and improved means for transferring automatically formed pouches from the forming mechanism to conveying and filling mechanism. It also comprises means for supplying successive charges to each of a succession of pouches and properly compressing each charge. It also comprises means for inserting a card in each pouch, this means being properly coordinated with the filling mechanism.

Evidently also it includes numerous important and valuable details of construction, combinations and sub-combinations of parts, in addition to the more important features, some of which are particularly mentioned just above.

Evidently variations may be made, too numerous to mention, and we do not limit ourselves to structural details, except as claimed.

What I claim is:

1. In mechanism for producing a succession of package pouches, means for feeding a continuous strip of pouch material, means for covering the strip at blank intervals, means for positioning the severed blanks, means for forming the successive blanks into pouches, and means for adjusting the sever-

ing mechanism and for simultaneously adjusting the positioning mechanism to maintain the centering of the blanks.

2. In mechanism for producing a succession of package pouches, means for feeding two continuous strips of pouch material, means for severing the strips at blank intervals, means for positioning the severed blanks, means for forming successive pairs of blanks into pouches, and means for adjusting the severing mechanism to compensate for feed variations and for adjusting the positioning mechanism to maintain the centering of the blanks.

3. In mechanism for producing a succession of package pouches, means for feeding a continuous strip of pouch material, means for cutting individual blanks successively from the strip, means for adjusting the cutting means, and means arranged to give a visible indication corresponding with variations in adjustment of the cutting means.

4. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for feeding two continuous strips of pouch material, means for cutting individual blanks successively from the strips, means for adjusting the cutting means, and means arranged to give a visible indication corresponding with variations in adjustment of the cutting means.

5. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for feeding a continuous strip of pouch material, means for cutting individual blanks successively from the strip, means for adjusting the cutting means, and a visual indicator connected to move in accordance with variations in adjustment of the cutting means to aid in determining blank and strip feed registration.

6. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for feeding two continuous strips of pouch material, means for cutting individual blanks successively from the strips, means for adjusting the cutting means, and a visual indicator connected to move in accordance with variations in adjustment of the cutting means to aid in determining blank and strip feed registration.

7. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for feeding a continuous strip of pouch material, means for cutting successive blanks from the strip, means for positioning the sucessive blanks in relation to forming mechanism, and means for adjusting the cutting and positioning means simultaneously.

8. In mechanism for producing a succession of package pouches, to be filled with tobacco or a similar commodity, means for feeding two continuous strips of pouch material, means for cutting successive blanks from the strips, means for positioning the successive blanks in relation to forming mechanism, and means for adjusting the cutting and positioning means simultaneously.

9. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, primary feed means for continuously advancing a strip of pouch material, secondary feed means for advancing the strip by blank lengths, means for cutting successive blanks from the strip, means for positioning the blanks in relation to the forming mechanism, and means to adjust the cutting means and positioning means simultaneously to vary the blank length to center the blank in relation to the forming mechanism.

10. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, primary feed means for continuously advancing two strips of pouch material, secondary feed means for advancing the strips intermittently by blank lengths, means for simultaneously cutting successive blanks from both strips, means for positioning the pairs of blanks in relation to the forming mechanism, and means to adjust the cutting means and positioning means simultaneously to vary the blank length to center the blanks in relation to the forming mechanism.

11. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, primary feeding means to continuously advance a strip of pouch material, a secondary feed means to advance the strip intermittently by blank lengths, means for cutting off successive blanks, means for positioning the blanks in relation to the forming mechanism, and an index window to reveal strip feed variations.

12. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, primary feeding means to continuously advance two strips of pouch material, secondary feed means to advance the strips intermittently by blank lengths, means for simultaneously cutting off successive blanks from each strip, means for positioning the blanks in pairs in relation to the forming mechanism, and an index window to reveal strip feed variations.

13. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, primary feeding means to continuously advance a strip of pouch mate-

rial, secondary feed means to advance the strip intermittently by blank lengths, means for cutting off successive blanks, means for positioning the blanks in relation to the forming mechanism, and an indicator connected to move in accordance with the adjustment of the cutting means to reveal variations in cutter positions.

14. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for intermittently advancing a continuous strip of pouch material by blank lengths, a guide for the strip posterior to the advancing means, means for cutting off successive blanks from the guided strip, and an index window located on the guide to point out feed variations.

15. In mechanism for producing a succession of package pouches to be filled with tobacco or similar commodity, means for intermittently advancing two continuous strips of pouch material by blank lengths, guides for the strips posterior to the advancing means, means for cutting off successive blanks simultaneously from the guided strips, and an index window located on one of the guides to point out feed variations.

16. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing a continuous strip of pouch material, and blank cutting and positioning means comprising a cutting suport, a positioning suport, a cutter on the cutting support arranged to cut successive blanks from the advancing strip, and means for adjusting the two supports simultaneously.

17. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing a continuous strip of pouch material, and blank cutting and positioning means comprising a cutting support, a positioning support, a cutter on the cutting support arranged to cut successive blanks from the advancing strip, a blank guide on the positioning support, and means for adjusting the two supports simultaneously with relation to blank forming mechanism.

18. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, pouch forming mechanism, means for advancing two continuous strips of pouch material in substantially parallel relation, and blank cutting and positioning means comprising a cutting support and a positioning support, two cutters, one for each strip, on the cutting support, positioning channels, one for each strip, on the positioning support, and means for adjusting the supports simultaneously with relation to the pouch forming mechanism.

19. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing a continuous strip of pouch material, means for forming the strip into successive pouches, means for applying marginal adhesive stripes to the strip prior to pouch formation, and means for partially drying the adhesive stripes before pouch formation.

20. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing two continuous strips of pouch material, means for forming the strips into successive pouches, means for applying marginal adhesive stripes to one of the strips prior to pouch formation, and means for partially drying the adhesive stripes before pouch formation.

21. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing a continuous strip of pouch material, means for forming the strip into successive pouches, means for applying marginal adhesive stripes to the strip prior to pouch formation, and means for applying an air blast to the adhesive stripes prior to pouch formation.

22. In mechanism for producing a succession of package pouches to be filled with tobacco or a similar commodity, means for advancing two continuous strips of pouch material, means for forming the strips into successive pouches, means for applying marginal adhesive stripes to one of the strips prior to pouch formation, and means for applying an air blast to the adhesive stripes prior to pouch formation.

Signed at Brooklyn, in the county of Kings and State of New York this 14th day of February, A. D. 1921.

JONATHAN PETERSON.

Signed at Chicago, in the county of Cook, and State of Illinois this 16th day of February, A. D. 1921.

JAMES C. THOM.