W. E. MOLINS.

APPARATUS FOR MAKING BAGS OR POCKETS.

APPLICATION FILED JAN. 9, 1912.

1,091,235.

Patented Mar. 24, 1914.

5 SHEETS—SHEET 1.

FIG: 1.

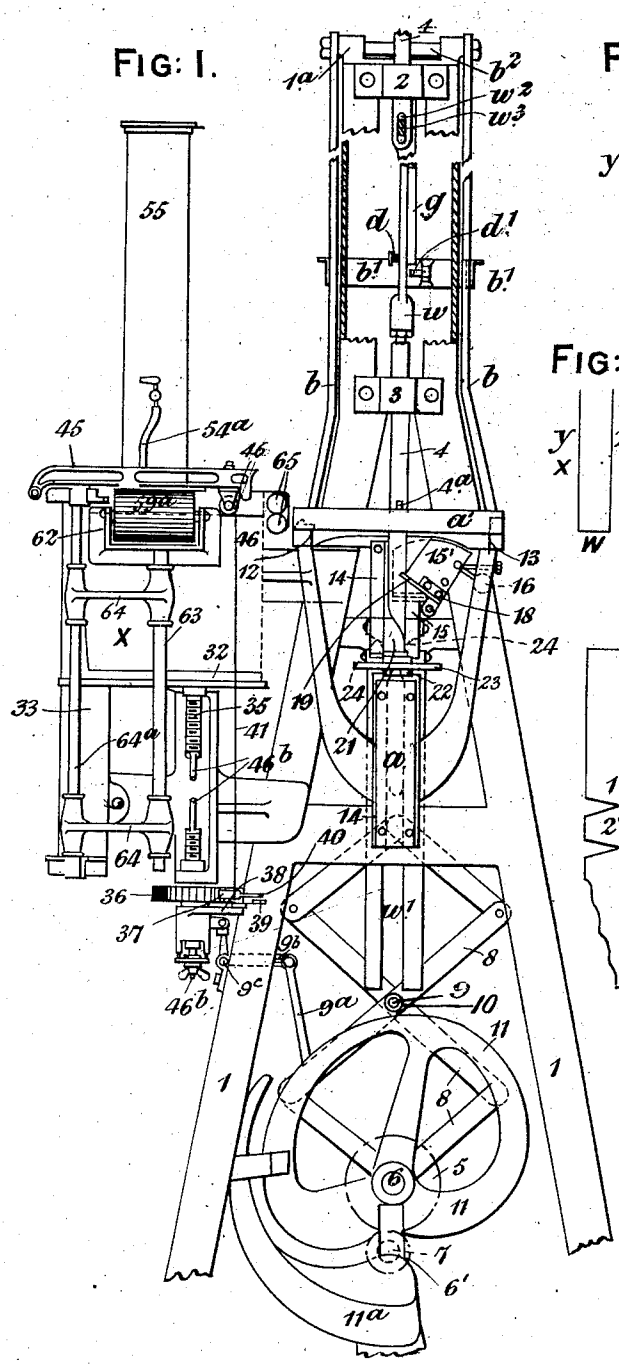


FIG: 2.

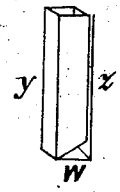
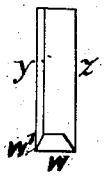


FIG: 3.

FIG: 4.



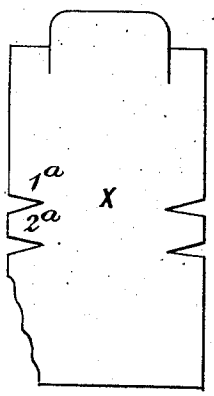


FIG: 5.

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5 SHEETS—SHEET 2.

FIG: 6.

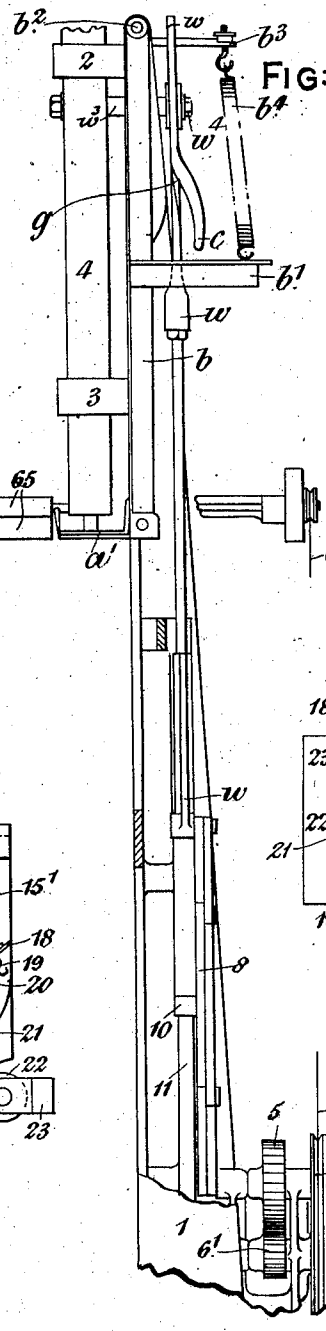


FIG: 7.

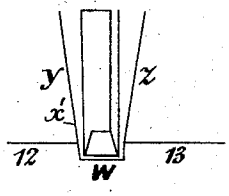


FIG: 8.

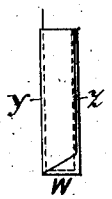


FIG: 9.

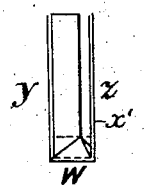


FIG: 10.

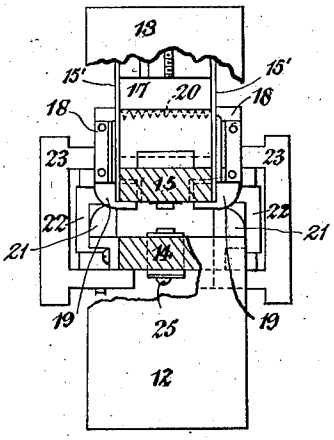
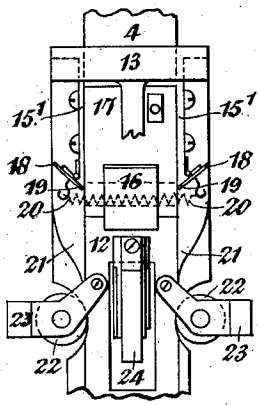


FIG: 11.



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6 SHEETS—SHEET 3.

FIG: 12.

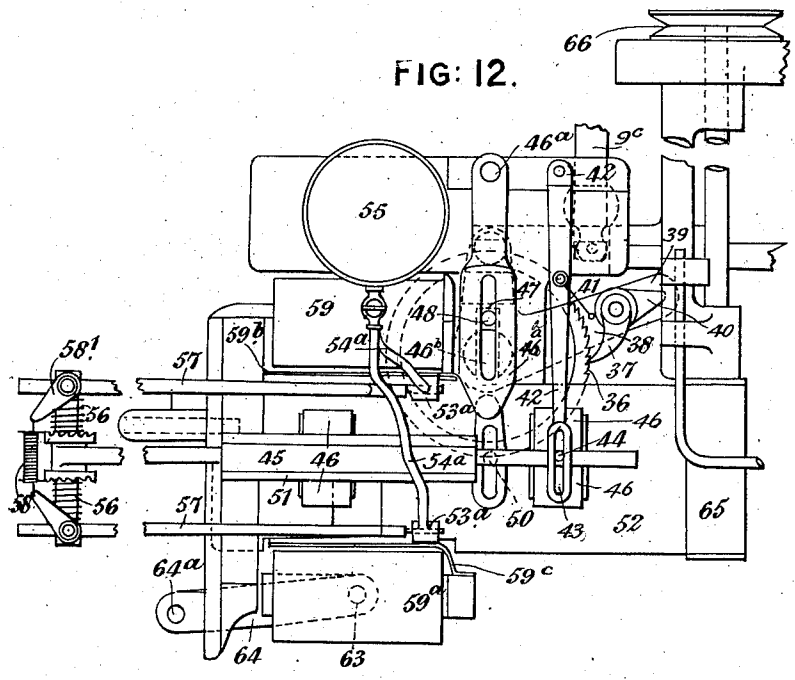


FIG: 21.

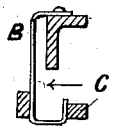
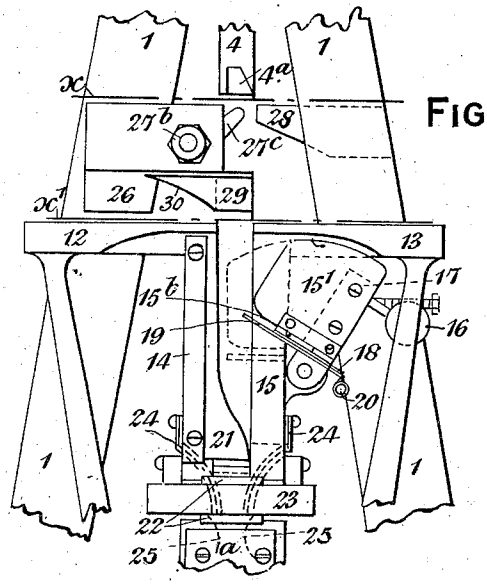


FIG: 13.



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5 SHEETS—SHEET 4.

FIG: 14.

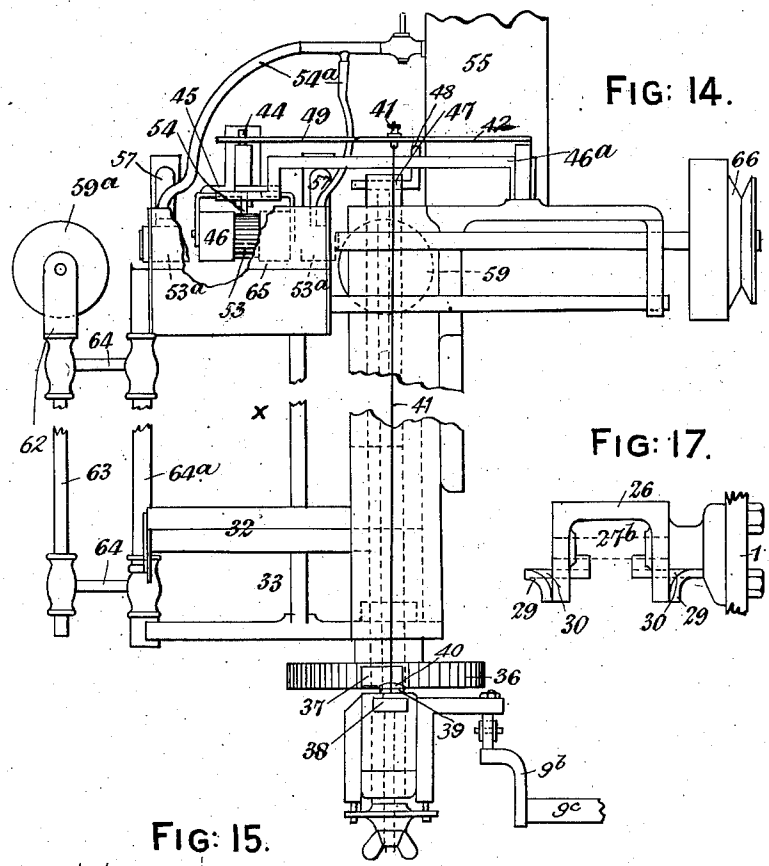


FIG: 17.

FIG: 15.

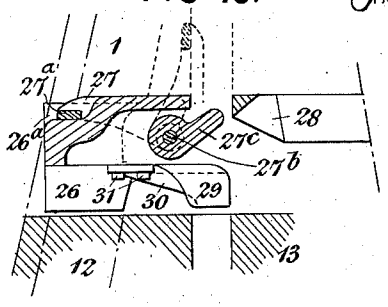
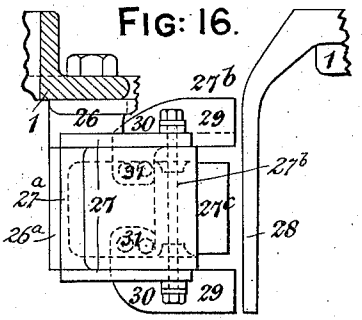


FIG: 16.



Witnesses:

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5 SHEETS—SHEET 5.

FIG: 18.

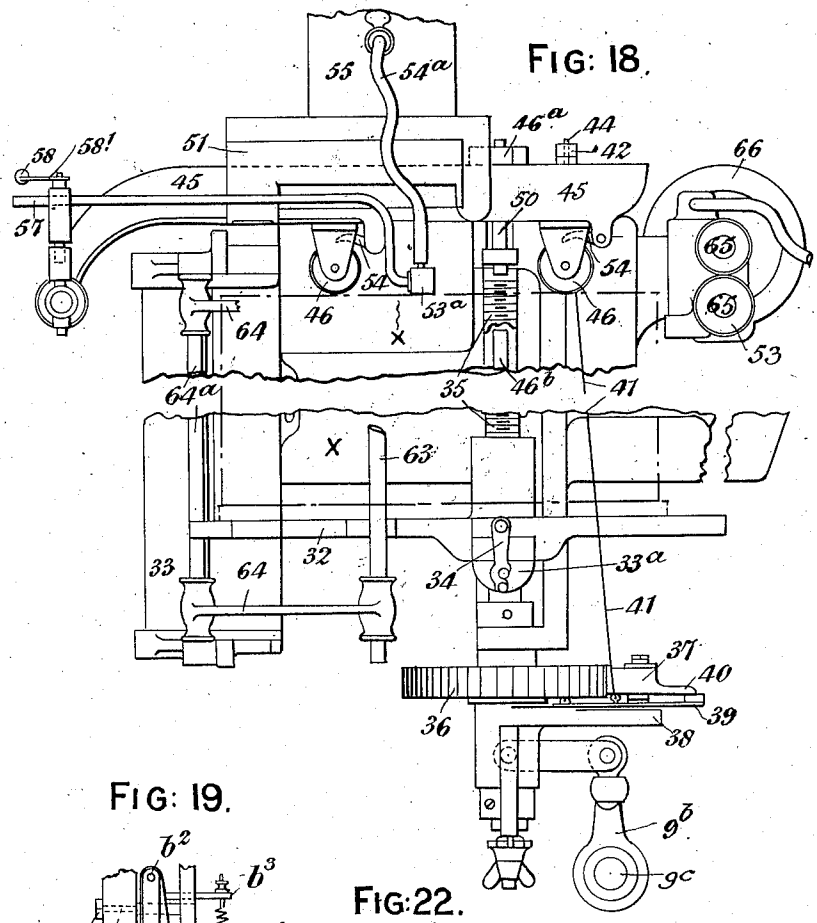


FIG: 19.

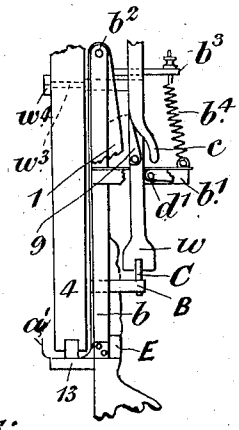


FIG: 22.

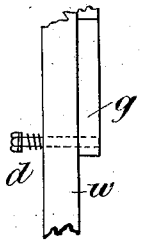
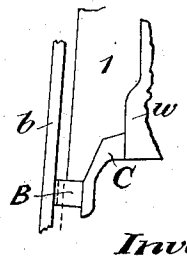


FIG: 20.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING BAGS OR POCKETS.

1,091,235. Specification of Letters Patent. Patented Mar. 24, 1914.

Application filed January 9, 1912. Serial No. 670,137.

To all whom it may concern:

Be it known that I, WALTER EVERETT MOLINS, a citizen of the United States, residing in London, England, have invented certain new and useful Improvements in Apparatus for Making Bags or Pockets, of which the following is a specification.

This invention relates to apparatus for making bags or pockets from flat sheets of paper or other material, and it refers to apparatus of the kind in which plunger actuated folding devices are employed.

It has for its object to provide a simple and efficient form of apparatus of this class in which the formation of the pocket is completed in one operation of the machine, and it is designed more particularly for the production of so-called block bottom pockets of the type where, after the bottom and the two sides are formed, the remaining open sides are closed by two side folds being tucked in first, the bottom edges being folded on top of these, the two last folds of the edges of the sheet to which paste may have been previously applied upon the inside, the paste holding the pocket together; the pocket when finished thus presenting only one open end.

A machine constructed in accordance with the present invention may moreover, by duplicating certain portions of the folding mechanism, be arranged to produce both a pocket and shell at one operation, the said pocket being placed in the shell, whereby the hand labor heretofore employed to effect this operation is dispensed with.

In order that the invention may be the better understood, drawings are appended illustrating two forms of the invention, and in which:—

Figure 1. is a front elevation partly in section and with certain parts omitted. Figs. 2, 3 and 4 show various stages in the formation of the box. Fig. 5. is a plan of a blank from which the box is formed. Fig. 6. is a side elevation also partly in section. Figs. 7, 8 and 9 show various stages in the production of the combined shell and slide. Fig. 10. is a part sectional plan of the folding mechanism. Fig. 11. is a side view of the folding mechanism. Fig. 12. is a plan of the feed mechanism. Fig. 13. is a front view of the machine showing more clearly the arrangement of the parts of the folding mechanism. Fig. 14. is a side elevation of the feed mechanism. Fig. 15. is a side view partly in section of the said alternative folding mechanism. Fig. 16. is a part sectional plan of the alternative folding mechanism. Fig. 17. is a plan of certain parts of an alternative form of folding mechanism. Fig. 18. is a front view of the feed mechanism and container for the paper with certain parts omitted. Fig. 19, is a side elevation partly in section showing more clearly the operative mechanism for the swinging arms carrying the blank from the magazine to the former. Figs. 20 to 22 illustrate details of the swinging arm mechanism.

Referring to the accompanying drawings, 1 indicates a framework of any suitable construction upon which are provided guides 2, 3, for a vertically reciprocating plunger or former 4. The plunger 4 receives motion from a toothed wheel 5 mounted upon a shaft 6 supported in bearings formed upon or attached to a suitable base plate arranged behind the frame 1. The shaft 6 receives motion from a shaft 7 operated by means of a pulley from some suitable source of power, the motion of shaft 7 being transmitted to shaft 6 through pinions 5 and 6^1 secured to the respective shafts 6 and 7.

In order that the operation of the plunger may be automatically checked in the event of there being any material increase in the thickness of the paper operated upon, for example should the feed mechanism present two blanks instead of one to the plunger, I provide an arrangement whereby the thickness of the material will act to hold the plunger back. By this means any damage that might be caused by the forcing of the thicker material through the machine is avoided. In order to achieve the desired result, I employ a means of operation for the plunger, and of such a nature that the said plunger is free thereof for a certain portion of its stroke, such portion of the stroke being due wholly or partly to its own weight. The plunger after its movement above referred to is accomplished, is reëngaged by its operating means and thereafter for the rest of one cycle of operations is positively driven.

In practice the free travel of the plunger is arranged to take place at that portion of its movement during which the paper or other blank is placed in position and the plunger commences its operation thereon. In the present instance I employ a lazytongs 8, Figs. 1 and 6, fixed at one end to the rod

w operating the plunger 4, and at the other end attached to shaft 6 in such a manner that it does not impede the rotation of said shaft. The rod w aforesaid is provided at its lower end with guides w^1, Fig. 1, the upper end of the said rod being slotted at w^2 and engaging a pin w^3 clamped to said rod by the nut w^4, Fig. 6, and by means of which pin the plunger 4 is connected to the operating rod w. Arranged at one of the points of intersection of the cross members of the lazy-tongs is a pin 9 upon which is mounted a roller 10. The roller projects into the path of a cam 11 mounted upon the shaft 6, and which cam is formed in two parts, of which parts one, 11^a, only surrounds the body of the cam 11 for a certain distance so that between the respective outer surfaces of the cam 11 and the part 11^a there is formed a cam race which engages the roller during a certain point of the cam's rotation, the said roller at the other times being free of the cam so that in the event of the paper offering too great a resistance the plunger will be held back and the cam will continue its rotation without acting upon said plunger, and as will be hereafter described the paper feed will also be stopped. Secured in any convenient manner to the front of frame 1 are brackets 12, 13 which brackets at their inner ends are provided with depending members 14 and 15 to which are secured the various members for effecting the folding of the paper or other material to form the pocket. The brackets 12 and 13, between the vertical faces of which a space or slot is left equal to the thickness of the pocket, are each provided at their upper end with horizontal members upon the upper surface of which the paper x, to which adhesive has previously been applied by the means hereafter described, is placed in a position ready for the operation of the former 4. The former 4 is of an outline corresponding to the cross sectional outline of the pocket, and in order to prevent the formation of a vacuum in the end of the pocket as the former is withdrawn, provision is made for the passage of air through the former to this point. In order to prevent the formation of projections due to the thickness of paper or the like at this point, the lower end of the plunger at the side is recessed as shown at 4^a, Figs. 1 and 13. Pivotally supported upon the member 15 of bracket 13 are plates 15^1, curved as shown at their lower end, which plates are arranged upon each side of the former, see Figs. 1, 10, 11 and 13, and are adapted to move into a position such that they lie one upon each side of said former as shown by dotted lines in Fig. 1. The plates are normally held clear of the former by means of a weight 16 supported upon a pin attached to the body 17 by which plates 15^1 are supported upon their pivot. The plates 15^1 are provided at their lower ends with members 18 which are hinged to said plates 15^1, and are at their inner ends provided with extensions 19 which project into the path of the plunger or former 4. The hinged members 18 are normally held in a position at a right angle to the line of the plates to which they are secured, by means of a helical spring 20, each end of which is attached to one of the aforesaid members 18.

By means of the arrangement just described, as the plunger or former 4 descends the paper is first turned upward against the sides of the former, and as it is carried down, the end of the former with the paper thereon comes into contact with the extensions 19 upon the hinged members 18 of plates 15^1. The plates 15^1 on their initial movement engage the lower ends of the projecting sides of the paper, and as they continue to move into the vertical position a tuck or fold is formed at this point, which tuck or fold is indicated by w^1 in Fig. 4, and is disposed within the opening 15^b at the lower end of the plate 15^1, Fig. 13, said opening being arranged between plates 15^1 and the horizontal yielding plates 18, which plates 18 serve to support the fold during the operation referred to, and also to support the bottom of the pocket. The spring 20 connected to the said hinged members is of sufficient strength to both maintain the members in their horizontal position against the downward thrust of the plunger 4, and against the effort required to cause the inner vertical edges of the plates 15^1 to act upon the paper and form the longitudinal folds upon one side of the pocket. The spring 20 when the front vertical edges of the plates 15^1 are in alinement with the surface of one side of the former 4, at which period the inner face of the body 17 is in the vertical plane, and pressing flat against the back of the bracket 15 will be overcome by the downward pressure of the plunger, and the members 18, and the extension thereon, will be turned into the vertical plane, the extensions 19 thereafter acting to turn the projecting portion at the sides of the bottom of the pocket upward against the sides of the plunger 4.

The counterweight 16 is of sufficient bulk to cause plates 15 to return to their normal position after the plates 18 have completed their work. Before the bottom plates start to yield they bear the pressure of the plunger at a point close to their hinged center, and as the plunger continues its downward movement and the plates yield, their point of contact with the said plunger recedes from their hinged center, and therefore the leverage of the spring 20 gets weaker and weaker until after the bottom fold is produced and only the inner edges of the bottom plates are in contact with the sides of

the plunger, the weight of the part 16 on the swinging bracket entirely overcomes the tension of the spring 20 of the bottom plates, as well as the friction of the paper, and the said bracket swings back into its normal position as aforesaid, the plates 18 remaining in contact with the plunger, but in an open or flat non-obtruding position. These latter features permit of the last fold of the pocket being produced within a short stroke of the plunger because any undue obtrusion of the mechanism for forming the first folds would prevent the last fold being produced in the pocket before the latter were entirely clear of such obtrusion. The two stages in the formation of the pocket just referred to are shown in Figs. 3 and 4 where x indicates the paper which in Fig. 3 is shown as simply folded with the front y and back z of the pocket at a right angle to the bottom W, and in Fig. 4 the first longitudinal fold at the side of the pocket is formed, and the tuck made at the bottom of the said pocket.

Secured in any convenient manner to the sides of the vertical member 14 of the bracket 12 are plates 21, Figs. 1, 10 and 11, the edges of which are curved as shown in the drawings, said plates in addition to their peripheral outline also having a portion of their length turned or bent inward so that they engage the projecting portions of the pocket and turn or bend same over and inward against the sides of the former 4 and outside the aforementioned longitudinal folds already formed upon the sides of the pocket. The folding in the manner just referred to completes the formation of the pocket which then presents the appearance shown in Fig. 2. The further movement of the plunger or former 4 carries the pocket down into a heating device or chamber formed by plates 14 and 15 secured to the sides of brackets 12 and 13 so as to close the space or slot between the vertical members, and which may be heated in any convenient manner by a suitable device such for instance as an electric resistance, Bunsen-burner, or any other convenient means, and which in the present instance is indicated generally by a, and is provided with rigid walls. I may, however, retain such walls by means of spring pressure so that they will yield to any inequalities or differences in the thickness of the paper. The pockets in the passage to the heater are acted upon by means of rollers 22 which are supported in the frames 23 pivotally mounted upon the vertical members 14 and 15 of the brackets 12 and 13. The rollers act upon the side folds of the pocket, and serve to secure the proper adhesion of the gum provided upon said sides to secure them together. The pocket is removed from the former 4 upon the return movement of same, and the removal is effected by means of the springs 24, Figs. 11 and 13 which are secured to the members 14 and 15 and project through apertures therein so that their lower ends will engage the upper end of the pocket and as the plunger 4 moves upward, the said pockets are held and remain in the heater a until the next descent of the plunger. In order that the expulsion of the pockets may be insured, I provide spring members 25 which are shown by dotted lines in Fig. 13, and which act upon the pocket when it is removed from the plunger to slightly compress and buckle same so that its upper end is somewhat distorted and there is no chance of the next pocket being thrust into the pocket previously removed from the former.

Obviously the length of the heating device a may be varied as desired, and it may be of such length as to retain two or more pockets before they are thrust out. In the latter case an endless band may be substituted under the aforesaid plates to aid the progress of the empty pockets through the drying chamber.

As aforesaid I may in some instances arrange the apparatus in a manner such that I may simultaneously produce a shell with a pocket therein. In order that this may be accomplished, I duplicate the folding mechanism for the front, back and sides of the pocket, the arrangement being such that the partly folded pocket is brought into contact with the paper forming the outer case or shell, and the two are thereafter simultaneously acted upon and the shell and pocket formed at one operation, the said shell and pocket being discharged with the pocket open so that the contents may be placed in the pocket and the pocket closed.

The arrangement just referred to may be carried out by an exact duplication of the slot and pivotally mounted plates 15' with their accompanying hinged pieces 18 and projections 19. In practice, however, where a previously cut out stiff blank, x (see Fig. 5) is used as an inner pocket in lieu of a paper sheet, and where a simple overlapping of the cut flaps 1^a and 2^a would occur in lieu of folds or tucks as previously described, I may find it more convenient to simplify the folding mechanism for the inner pocket as illustrated in Figs. 13, 15, 16 and 17, the simplified inner pocket folding mechanism being arranged to coöperate with the pocket folding mechanism previously described, the latter in this case, however, forming the outer shell.

In the figures just referred to, it will be seen that at a point above the level of the folding mechanism before described as acting upon the pocket, I provide a bracket 26 which is bolted or otherwise secured to one of the vertical members of frame 1. The bracket 26 is of U-shaped outline and pivotally supported thereon is a body 27 which

is also of U-shaped outline, its transverse member 27^a being normally contained within a recess 26^a upon the upper surface of bracket 26 in Figs. 15 and 16. The upper surface of the bracket 26 in conjunction with an arm 28 forms a support for the paper x from which the pocket is formed. The arm 28 is disposed upon the opposite side of the plunger or former 4 to the bracket 26, and upon the same side of the plunger 4 as that upon which the plates 15^1 are arranged. The arm 28 serves in conjunction with the inner edge of the bracket 26 to effect the transverse folds in the blank whereby the back and front of the pocket are produced. Secured in any convenient manner to the pivot 27^b of the body 27 is a nose piece 27^c, which is normally disposed in a position such as illustrated in Figs. 13, 16 and 17 when it is in the path of the plunger or former 4, and which plunger as it moves downward carries the paper x with it and engaging the nose piece acts thereon and causes the pivot 27^b to turn, and the body 27 to be brought into the position shown in dotted lines in Fig. 15 when the transverse member 27^a is in contact with the upturned side of the paper x. During the movement aforesaid, the side members of the body 27 are brought into contact with the sides of the blank, and turn same inward against the sides of the former. Arranged upon each side of the line of movement of the plunger 4 are fixed members 29 which accomplish the bottom folds of the inner pocket. The fixed members 29 and the nose piece 27^c replace respectively the hinged pieces 18 and their projections 19 previously described. The members 29 form part of brackets 30 which are secured by means of screws 31 to the side members of the bracket 26. The blank x^1 for forming the outer shell is placed upon the upper surface of the brackets 12 and 13, and after the folding of the inner pocket in the manner just described, the plunger 4 with the partly folded pocket thereon comes into contact with the paper x^1 which it turns or folds upward as indicated in Fig. 7 by forcing it between the inner ends of the brackets 12 and 13.

The continued movement of the plunger 4 causes the side of the paper x^1 to be folded in the manner already described in connection with the pocket, but in this case the forming of the first longitudinal fold in the outer shell simultaneously effects the formation of the second longitudinal fold in the pocket, the plates 15^1 being disposed upon the opposite side of the former 4 to that upon which the body 27 is placed. This operation completes the formation of the pocket, the plates 15^1 and 18, and the plates 21 operating in the manner before stated serve to complete the folding of the outer shell. It will be understood that where a shell is employed, the inner pocket is provided with a flap designed to be turned in and tucked between the front of the outer shell and the front of the pocket so that the ends of the contents of said pocket are protected. As in the case of the pocket, such portions of the shell to which it is necessary that adhesive be applied have such adhesive applied thereto by any suitable means prior to their presentation to the machine.

The feeding mechanism to which reference has already been made, and which is illustrated in Figs. 1, 6, 12, 14, 18, to 22 comprises a suitable magazine which is arranged upon one side of the plunger, the blanks when removed therefrom being received by a tray a^1 carried by a pair of swinging arms b. The construction and operation of these parts will be hereafter more fully described. The magazine in addition to applying the necessary adhesive to the material presents certain novel features whereby the upward movement of the support for the papers is controlled by the height of the said papers. The feed apparatus also presents the novel feature that the gum applying members automatically adjust themselves to the width of the material in use. The magazine is open on one side so that the ready introduction of the blanks is permitted, which blanks when in the magazine are held against lateral displacement by a gate arrangement as shown, or other means which may be caused to press against the sides of the blanks. The gate just referred to is arranged so that it may be swung out of the way when placing the blanks in the magazine. The blanks are supported upon a plate 32 for which suitable guides are provided such as 33, which guides may engage suitable slots conveniently disposed in the plate. One of the said guides is disposed at the end of the blanks, and may be adjustable in order to suit blanks of different lengths. The plate 32 aforesaid is supported by a half nut 33^a which is slidably mounted thereon and is secured in the engaged position by means of the latch 34, Fig. 18. The half nut 33^a engages a screw thread upon a rod 35 supported at each end in suitable bearings, and which rod, as will be presently more fully explained, is hollow. The screw threaded hollow rod receives intermittent motion from a ratchet wheel 36 secured thereon, and with which engages a pawl 37 carried upon an arm 38, which arm receives a rocking motion as shown from the lazy tongs of the machine,—by means of the rod 9^a, Fig. 1, connected to a lever 9^b pivoted at 9^c on the frame 1. By arranging for the operation of the feed mechanism from the lazy tongs 8 it is evident that the checking of the movement of the plunger 4 will also stop the feeding of the blanks. Arranged

between the operating arm for the pawl just referred to, and the said pawl, is a resilient plate 39, Fig. 18, one end of which is provided with a piece of leather or any other material designed to come into contact with a surface upon an extension 40 of the pawl 37. The pawl 37 is spring pressed into engagement with the ratchet, and normally the friction surface upon the spring member is clear of the pawl. At certain periods, however, as will be hereafter explained, the friction surface comes into contact with the surface on the pawl, and at such time the pawl is held out of engagement with the ratchet, and no upward movement of the plate supporting the blanks takes place. The action just described is effected by means of a wire 41 or other flexible connection Figs. 12 and 18 attached at one end to the spring member 39, and at the other attached to a radially moving arm 42, Figs. 12 and 14 connected at one end by the slot 43 to a pin 44 on a member 45 carrying rollers 46 whereby the feed of the blanks from the magazine is effected. The arm is so constructed and arranged that it is capable of a certain amount of movement transversely of its length. Means are provided for adjusting the effective length of the wire 41. It will be readily understood that when the uppermost blank is at a certain level the rollers 46 pressed thereon will lift the arm 42 pulling the wire 41 and lifting the spring member 39 so that there is contact between the leather thereon and the surface of the extension 40 on the pawl 37. When this takes place the feed pawl is thrown out of action as before stated.

The mechanism whereby the blanks are removed from the magazine comprises a bar or other body 45 receiving reciprocal motion through arm 46^a by means of a rod 46^b passing through the aforesaid hollow screwed rod 35, see Figs. 1, 14 and 18 and attached as shown to the rocking arm 38 carrying the feed pawl 37, and having at its upper end an adjustable arm 47 provided with a projection 48 engaging a slot in the said arm 46^a operatively associated with the aforesaid bar or body by means of the slotted end thereon which engages a pin 50 shown in dotted lines in Fig. 12, and in full in Fig. 18. The bar or other body 45 moves in suitable guides 51, and carries supports for rollers 46 which rest upon the upper surface of the uppermost blank x in the magazine. The rollers 46 just referred to are preferably provided with a roughened surface which may comprise a number of small stud-like projections thereon, and they are so arranged that during the inoperative portion of the movement of the body to which they are attached, they are free to rotate. This action is secured by providing the rollers at their spindles with a ratchet wheel 53 with which engages a pawl 54 as shown in Figs. 14 and 18. Upon the opposite movement of the body 45 taking place, the rollers are fixed and operate to push the blank out of the magazine. The gumming shoes 53^a are supplied by tubes 54^a connected in any convenient manner with a gum receptacle 55, and which tubes 54^a are capable of radial movement in both the horizontal and vertical planes. The movement in the planes just referred to is controlled on one hand by means of springs 56 coiled about the pivots of the radially moving rods 57 carrying the tubes 54^a to cause them to bear upon the surface of the blanks with the desired amount of pressure, and on the other hand the tubes are acted upon to cause them to travel toward the edge of the paper, by means of springs 58 acting upon arms 58^1 connected to the pivots of the rods 57. The outward movement of the rods however, is controlled by means of shields 59^b, 59^c attached to the spindle of rollers 59, 59^a, the purpose of which will presently be explained. The ends of the tubes just referred to are provided with swiveled shoes as shown or the like 53^a presenting a sufficient surface to cause the tubes to adjust themselves to the angle of the surface upon which they rest. By this means the proper application of the adhesive is insured in the event of the buckling or curving of the blank.

The rollers 59, 59^a just referred to are arranged one on each side of the top of the magazine, and said rollers are arranged so that their axes are in, or substantially in the plane of the uppermost blank. One of the rollers is fixed while the other is mounted upon a member 62 free to move laterally under spring pressure so that it may automatically adjust itself to the width of the blanks against the sides of which the rollers bear. The roller is supported at the upper end of a rod 63 carried by arms 64 arranged to swing in the horizontal plane by means of a pivot 64^a to which one end of the arms is attached. In order that the feeding of more than one blank may be avoided in the case of a variation in the widths of the blanks, the surface of the rollers, which are covered with rubber or other suitable elastic material, are provided with small projections arranged upon lines inclined to the line of their axes. The blanks when removed from the magazine are fed by continually rotating rollers 65 to the packet machine. Such rollers may be driven by a belt 66, Fig. 6 from a pulley 67 on the shaft 7 of the packet making machine. The blanks when fed by the rollers 65 are received in the aforesaid tray a'.

Instead of employing rollers having surfaces such as those before referred to, I may employ, hair wire, or other bristles in place of the rubber or the like, said bristles, being preferably arranged so that they are inclined

relatively to the longitudinal axis of the roller.

The tray a' as already stated is attached to the lower ends of the arms b, which arms are disposed upon each side of the frame 1 as shown in Figs. 1, 6 and 19. The arms are connected by a U shaped member b^1 arranged behind the frame 1. The arms b are secured to a pivot b^2 carried in bearings, and the bearing has attached to it a projection b^3 to which is attached one end of a spring b^4, the other end of the spring being attached to the aforesaid U shaped member b^1. The tendency of the spring b^4 is to pull the arms sharply inward, the outward movement of the arms b being effected by means of the projection c attached to the upper end of the rod w attached to the lazy tongs 8. The tray is cut away or otherwise shaped to permit the passage of the plunger and at one end it is provided with an abutment a which is shown as being fixed, but which in practice will preferably be an adjustable member so that the position of the blanks may be properly adjusted with regard to the former 4. The tray may also have its side members capable of adjustment to suit blanks of different widths. The operating member or projection c before referred to has coöperating with it a body g pivotally mounted upon the rod w, and which body is of wedge shaped outline and is yieldably held by means of a spring d, Fig. 1 with its outer surface flush with the outer surface of the body to which it is attached during the downward movement of the rod. A roller d^1 travels over the inner surface of body c, said roller being carried by the U shaped member b^1. As the wedge shaped body is pivotally mounted as aforesaid, the roller presses the upper end outward and passes on to the outer surface of rod w, pulling arms b outward to receive the blank. On the return movement of the rod w, the roller travels on the outside of the wedge shaped body, its passage over the end of the wedge shaped body producing a sharp inward movement to bring the tray, and with it the blank, beneath the plunger. The swinging arms during this movement operate against the spring b^4. The tension of the spring b^4 effects the sharp inward movement above referred to.

The machine may be readily adapted for making packets of various sizes by simply varying the widths of the rod and the angle brackets, or the width between the folders, rollers and plates, the folding parts being mechanically self-acting, or independent and self-contained. It will also be seen that the principle upon which the sheets are gummed and folded permits of making a double pocket consisting of an outer wrapper and an inner lining. The gummed edges of the bottom sheet would adhere to the top sheet and the same gummed edges of the top sheet would adhere to the outer edges of the bottom sheet when the pocket is made up. I may also double the production of my machine by duplicating the brackets, 12, 13, which may be placed at each end of a plunger so that a pocket may be made at both right and left stroke of the plunger. Obviously where the machine is arranged to produce at one operation an inner slide and an outer shell, the magazine and the swinging arms with the tray presenting the blanks to the former would be duplicated. In order to check the impetus of the swinging arms b^1, I may provide the frame 1 with resilient members B as shown in Figs. 20 and 21, said members B being placed upon each side of the frame, and being expanded by a V shaped projection C on the rod w as shown. By this means any recoil which might take place through a too violent contact of the arms with the leather or other buffer E is prevented.

Claims:

1. A packet making machine comprising a reciprocating former, two pairs of movable folders actuated successively by said former to form the first longitudinal folds and the end folds in a blank, and stationary folders for forming the final longitudinal folds therein.

2. A packet making machine comprising a reciprocating former, movable folders actuated by said former to form the first longitudinal folds in a blank, other folders hinged to the movable folders and actuated by the former at a later period for forming the end folds therein, and stationary folders for forming the final longitudinal folds.

3. A packet making machine comprising a reciprocating former, swinging folders comprising a pair of parallel plates, movable in unison and actuated by said former to form the first longitudinal folds in a blank, a second folder hinged to each of said plates and actuated by the former for forming the end folds, and stationary folders for forming the final longitudinal folds.

4. A packet making machine comprising a reciprocating former, fixed means for folding a packet blank over the end of said former as it advances and against opposite sides thereof with its edges projecting beyond said former, movable folders actuated by the former for turning the edges of one portion of said folded blank against the former, other movable folders actuated at a later period by said former to form the end folds, and stationary folders for turning the remaining edges of the blank upon the previously made folds to complete the packet.

5. A packet making machine comprising a former, means for operating the former, folders operated by said former forming longitudinal folds, yieldable members as-

sociated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the paper, and means for receiving the packets when formed.

6. A packet making machine comprising a former, means for operating said former, said operating means being disconnected from the former for a certain portion of its movement, folders operated by said former forming the longitudinal folds, yieldable members associated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the paper, and means for receiving the packets when formed.

7. A packet making machine comprising a former, means for operating said former, comprising a rod connected to said former, lazy tongs connected to said rod, a roller upon said tongs, a cam engaging said roller, said cam having a portion of its race open to leave the roller free, folders operated by said former forming the longitudinal folds, yieldable members associated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the paper, and means for receiving the packets when formed.

8. A packet making machine comprising a former, means for operating said former, comprising a rod connected to said former, lazy tongs connected to said rod, a roller upon said tongs, a cam engaging said roller, said cam having a portion of its race open to leave the roller free, means for transferring said papers from the magazine to a position ready for the operation of the former, folders operated by said former forming the longitudinal folds yieldable members associated with said longitudinal folds, yieldable members associated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, a paper magazine, rollers for acting upon the sides of the packet upon the former, and means for receiving the packets when formed.

9. A packet making machine comprising a former, means for operating said former, comprising a rod connected to said former, lazy tongs connected to said rod, a roller upon said tongs a cam engaging said roller, said cam having a portion of its race open to leave the roller free, means for transferring said papers from the magazine to a position ready for the operation of the former, folders operated by the former, and arranged upon the opposite side of the line of movement of the former, folders operated by said former forming the longitudinal folds, yieldable members associated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, rollers for acting upon the sides of the packet upon the former, and means for receiving the packets when formed.

10. A packet making machine comprising a former, means for operating said former, comprising a rod connected to said former, lazy tongs connected to said rod, a roller upon said tongs a cam engaging said roller, said cam having a portion of its race open to leave the roller free, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the paper, folders operated by the former, and arranged upon the opposite side of the line of movement of the former, folders operated by said former forming the longitudinal folds, yieldable members associated with said longitudinal folders for forming the end folds, fixed folders coöperating with the side and end folders, rollers for acting upon the sides of the packet upon the former, and an electrically heated receiver for the packets when formed.

11. In a packet making machine, a former, folders actuated by said former to produce the longitudinal folds of the packet, yielding bodies associated with said folders to produce the end folds, and folders for completing the folding operation, rollers for acting upon the sides of the packet upon the former, a magazine for the blanks, a gumming device for the blanks, means for removing them from the magazine, means for presenting them to the former, and means for receiving the finished packets.

12. A packet making machine comprising a former, means for operating the former, folders arranged upon one side of the line of movement of the former and operated by said former for folding the longitudinal folds, fixed folders for forming the side folds, folders operated by the former, and arranged upon the opposite side of the line of movement of the former, yieldable members associated with said longitudinal folders for forming end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the blanks, and means for receiving the packets when formed.

13. A packet making machine comprising

a former, means for operating the former, said operating means being disconnected from the former for a certain portion of its movement, folders arranged upon one side of the line of movement of the former and operated by said former for folding the longitudinal folds fixed folders for forming the side folds, folders operated by the former, and arranged upon the opposite side of the line of movement of the former, yieldable members associated with said longitudinal folders for forming end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the papers, and means for receiving the packets when formed.

14. A packet making machine comprising a former, means for operating the former, comprising a rod connected to said former, lazy tongs connected to said rod, a roller upon said tongs, a cam engaging said roller, said cam having a portion of its race open to leave the roller free, folders arranged upon one side of the line of movement of the former, and operated by said former for folding the longitudinal folds, fixed folders for forming the side folds, folders operated by the former, and arranged upon the opposite side of the line of movement of the former, yieldable members associated with said longitudinal folders for forming end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the former, a gumming device for the blanks, and means for receiving the packets when formed.

15. A packet making machine comprising a former, means for operating the former, said operating means being disconnected from the former for a certain portion of its movement, folders arranged upon one side of the line of movement of the former and operated by said former for folding the longitudinal folds, fixed folders for forming the side folds, folders operated by the former, and arranged upon the opposite side of the line of the former, yieldable members associated with said longitudinal folders for forming end folds, fixed folders coöperating with the side and end folders, a paper magazine, means for transferring said papers from the magazine to a position ready for the operation of the folding device, and means for receiving the packets when formed.

16. A packet making machine comprising a reciprocating former, independent supporting means for a pair of blanks, and two sets of alined folders for successively folding said blanks about the former to successively form at a single operation a packet and a shell into which said packet is nested, each set of folders comprising coöperating fixed and movable folding devices, the said movable devices being successively actuated by the reciprocating former.

17. A packet making machine comprising a reciprocating former, independent supporting means for a pair of blanks, and successively operating means for partly folding one of said blanks to form a packet and completely folding the other blank about said packet to form a shell therefor, the final folds of the packet being performed simultaneously with the first folds of the shell.

18. A packet making machine comprising a reciprocating former, separate means for supporting a pair of blanks, movable and fixed folders arranged adjacent one of the said blank supports and coöperating with said former for partly folding one of said blanks about said former to partly form a packet, and other movable and fixed folding means arranged adjacent the other blank support for completely infolding the second blank around the partially folded packet to form a shell therefor and make the final folds in said packet.

19. A packet making machine comprising a reciprocating former, means for supporting a pair of blanks, means coöperating with said former for partly folding one of said blanks over said former to form a packet, and other means for completely folding the second blank around the folded packet to form a shell therefor, the final fold of the packet and the first fold of the shell occurring simultaneously and through the same means.

20. A packet making machine comprising a reciprocating former, means for supporting a pair of blanks, a series of successively operating folding devices coöperating with said former for partly folding one of said blanks over said former, and a second set of successively operating folding devices for completely infolding the other blank about the folded packet to form a shell therefor, the first actuating folding device of the second set of folding devices simultaneously completing the final fold of the packet and the first fold of the shell.

21. A packet making machine comprising a reciprocating former, supporting means for a blank adapted to turn said blank about the end of the movable former, movable folders actuated by the former to form the first longitudinal folds in said blank, folders for forming the e folds thereof, a second support for another blank adapted to turn said blank about the partly folded blank, a movable folder actuated by the advancing plunger for forming the first longitudinal folds in the second blank and si-

multaneously completing the folding of the first blank into a packet, other movable folders for forming the end folds of the second blank, and stationary folders for completing the folding of the second blank around the packet.

22. In a packet making machine, the combination with blank folding devices including a plunger, and means attached to the plunger for operating the same, a revolving shaft and a cam thereon, a lazy tongs connection pivotally mounted at one end on said shaft and at the other end to the plunger operating means, and means carried by said lazy tongs in engagement with said cam for positively depressing said plunger for a portion of its stroke and elevating the same through its full stroke.

Signed in the presence of the undersigned witnesses.

WALTER EVERETT MOLINS.

Witnesses:

H. B. MOLINS,

F. M. GILPIN.