W. E. MOLINS.

FEEDING DEVICE FOR PACKET MAKING MACHINES.

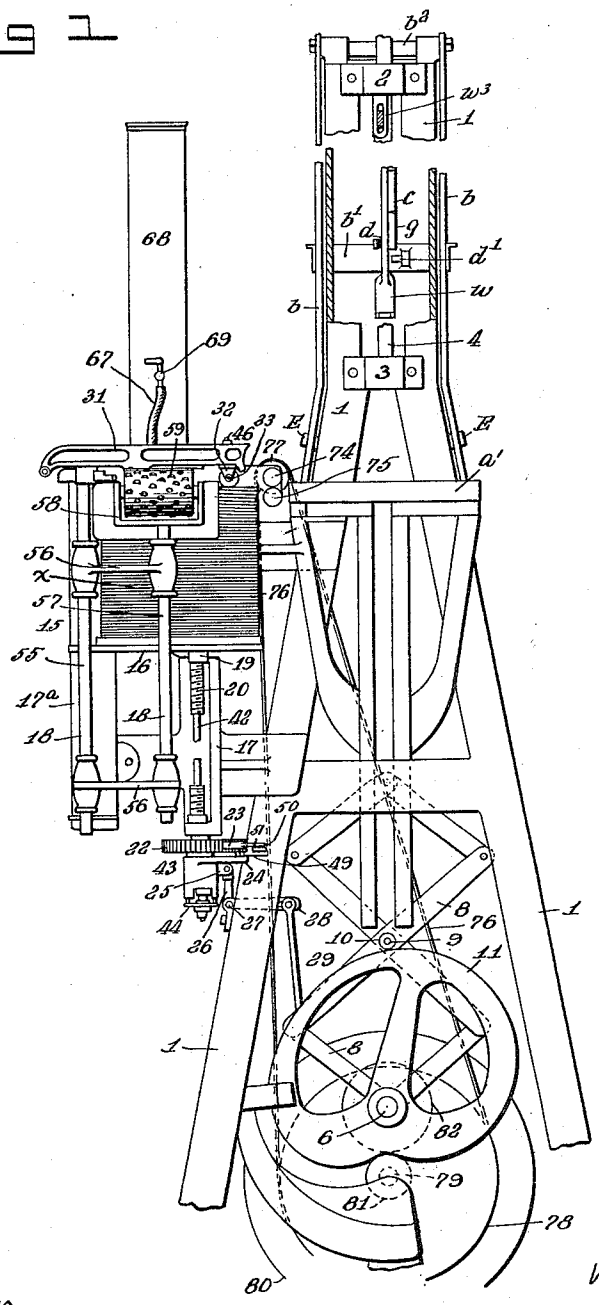
APPLICATION FILED JUNE 14, 1913.

1,144,772.

Patented June 29, 1915.

3 SHEETS—SHEET 1.

Fig 1.



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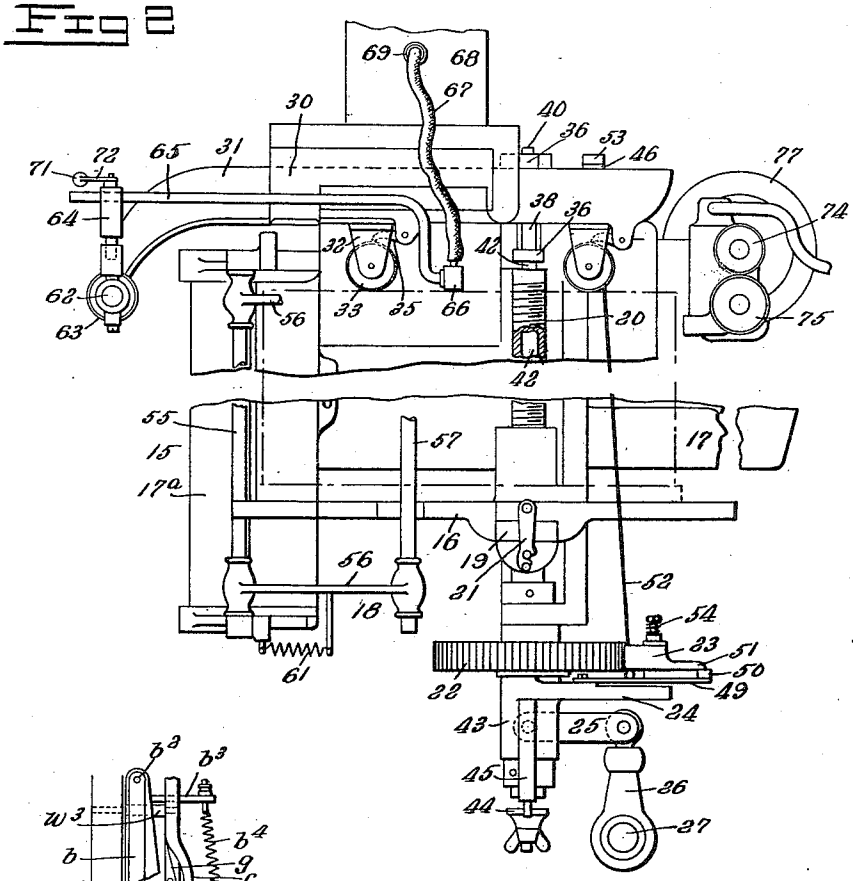
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3 SHEETS—SHEET 2.

Fig 2



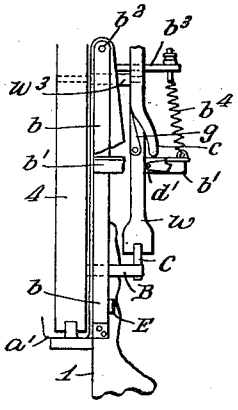


Fig 5

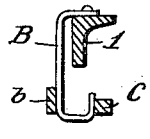


Fig 6

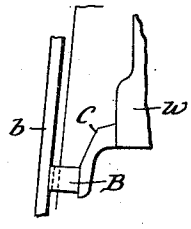


Fig 7

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3 SHEETS—SHEET 3.

Fig 3

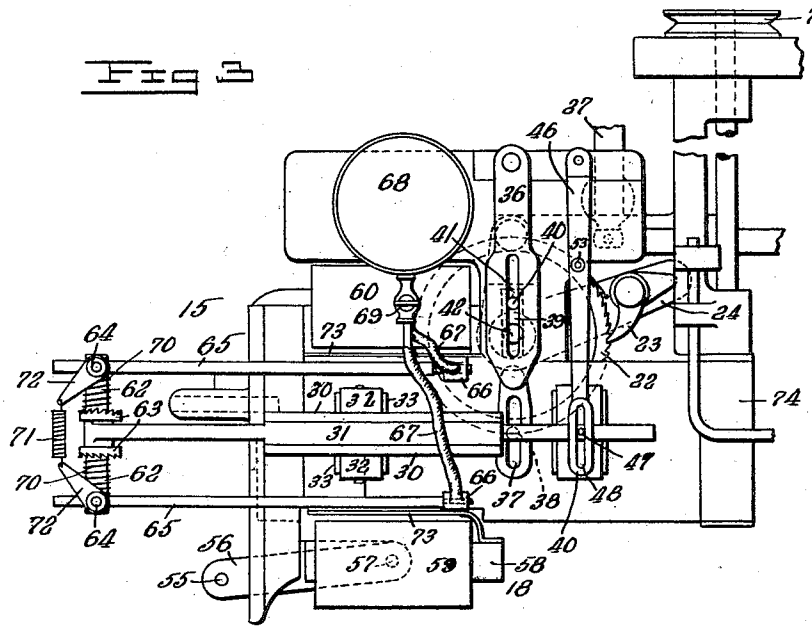
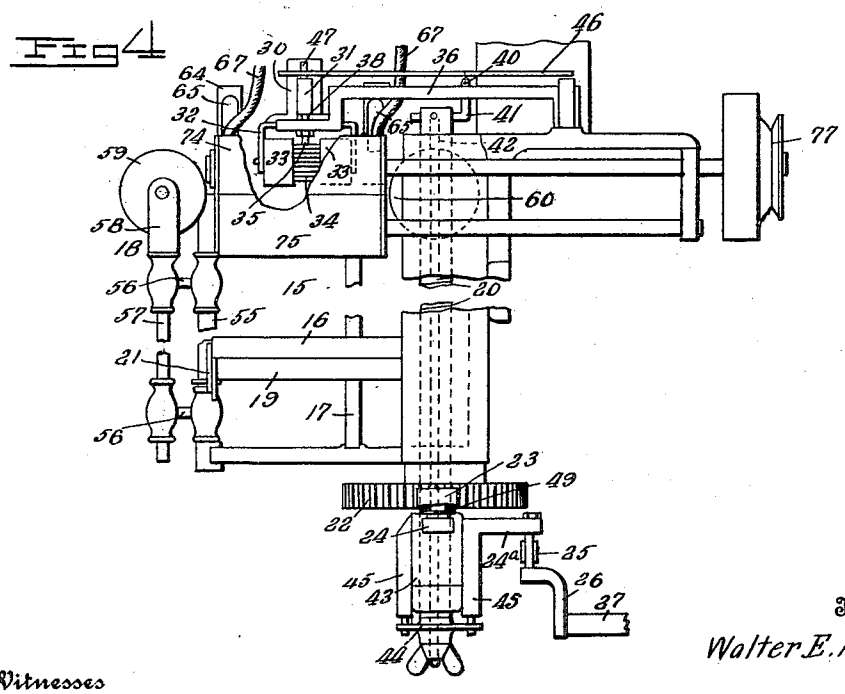


Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

WALTER E. MOLINS, OF LONDON, ENGLAND.

FEEDING DEVICE FOR PACKET-MAKING MACHINES.

1,144,772. Specification of Letters Patent. Patented June 29, 1915.

Original application filed January 9, 1912, Serial No. 670,137. Divided and this application filed June 14, 1913. Serial No. 773,743.

To all whom it may concern:

Be it known that I, WALTER E. MOLINS, a citizen of the United States, residing at London, England, have invented new and useful Improvements in Feeding Devices for Packet-Making Machines, of which the following is a specification.

This invention relates to mechanism for feeding blanks of paper and cardboard to folding machines for making packets or cases therefrom, and has for its fundamental object to provide feeding means particularly applicable to folding machines that work at comparatively high speeds upon blanks which at times require to have an adhesive applied to certain portions of one of their surfaces. In folding machines of the type to which this invention is to be applied, the speed is such that in the majority of cases the time between operations is too short for the blanks to be fed thereinto in a longitudinal direction, but must be fed transversely of the length of the blanks. The adhesive, however, has to be applied to said blanks in longitudinal lines, and, therefore, it becomes necessary for the blanks, or for the adhesive applying devices, to travel longitudinally of said blanks. The time, as previously stated, in which the blanks can be fed to the machine being so short, the adhesive cannot be applied to the blanks as they are advanced under the folding apparatus, but must be done at a time previous thereto. In order to effectively apply the adhesive thereto the blanks are moved in two directions or feeding lines before being acted upon by the folding devices, first longitudinally, and the primary feeding mechanism which effects this movement applies the adhesive, and secondly transversely by a secondary feeding mechanism by which the blanks are fed into the folding apparatus. The first movement of the blanks, or the movement in a longitudinal direction, is performed while the folding apparatus is operating on a previously fed blank, the final operation of feeding, that in a transverse direction taking place between the folding operations. This latter movement is a quick short one, and is necessarily so because of the short time given for placing the blank within the folding devices. The first feeding movement when the adhesive is applied, is slower, as the necessity of speed is not so great during this part of the operation. To perform these operations correctly the blanks are carried in a magazine adjacent the folding mechanism, and automatically fed to a device by means of which they are moved in a longitudinal direction below suitable adhesive applying shoes into a laterally movable trough, which at proper times, moves transversely to carry the blanks into position to be acted on by the folding devices. In connection with the feed mechanism is a means for automatically stopping the feed whenever two or more blanks are being fed or are likely to be fed to the folding mechanism.

With these and other objects in view the invention consists of a novel construction, combination, and arrangement of parts hereinafter described and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a portion of a folding machine with the improved feeding apparatus applied thereto. Fig. 2 is a similar view of the feeding mechanism alone, shown on a larger scale. Fig. 3 is a top plan view of the feeding mechanism. Fig. 4 is an elevation of the feeding mechanism as seen from the direction of the folding machine. Fig. 5 is a detail view on an enlarged scale of the upper portion of the main frame of the folding machine, showing certain portions of the feeding mechanism supported thereby. Figs. 6 and 7 are views illustrating certain details of the invention.

In the drawings 1 indicates a supporting frame for the folding mechanism on the top of which are secured guides 2, 3 for a vertical folding plunger 4 that in connection with other folding devices, shapes the blanks into bags or packets. These folding devices are not shown in the drawings, but are described and illustrated in my co-pending application for apparatus for making bags or packets, filed January 9, 1912 Serial No. 670,137, of which the present application is a division. Back of the plunger 4 is a vertical rod w connected at its upper end to the plunger 4 by a pin or bolt w^3 and at its lower end to one terminal of a lazy tongs 8, the other terminal of which is journaled on a shaft 6 near the bottom of the frame 1. Projecting from one side of the lazy tongs 8 is a pin 9 provided with a roller 10 that is engaged by a cam 11 to lift the lazy tongs,

rod w and folding plunger 4. These parts descend partway by gravity, but are drawn down positively by the cam 11 during the folding of the blank.

Pivoted on a cross shaft b^2 at the top of the frame 1 are two swinging arms b, one on each side of the frame, which depend for a suitable distance and support at their lower ends a tray a' with upturned sides upon which tray each blank is fed between the sides and by which it is transferred to the folding mechanism. The two arms b are connected by a curved bar b' and held in normal or retracted position by a spring b^4 connected to the bar b' and to a pin b^3 on the rear of the frame 1.

Projecting rearwardly from the rod w is a curved finger c which is above the curved bar b' when the plunger is elevated, see Fig. 5. Against the side of the rod w in front of the finger is pivoted a switch g its free end held normally against the base of the finger c by a yielding spring d. A pin or roller d' mounted on the bar b' projects forwardly therefrom in position to enter between the finger c and the switch g when the plunger and rod descend, the pin or roller d' following the curve of the finger, swings the arms b and tray a' forward a certain distance beyond the plunger 4 in position to receive a blank from the feeding mechanism in a manner to be described hereinafter. The pin or roller d' opens the switch g as the bar w descends and rides over the front of said bar, said front of the bar holding the arms and tray in a forward position during the further descent and a part of the rise of said bar. As soon as the pin or roller d' passes the switch g, the latter is returned to place by its spring d, thus compelling said pin or roller to ride over the switch and hold the tray a' forward until it has nearly reached its limit of upward movement at which point the bottom of the switch g passes beyond the pin or roller d', and the spring b^4, heretofore under tension, is released and swings the arms b back to normal, quickly carrying the tray a' with a blank therein, beneath the plunger 4. To check the impetus of the swinging arms b and prevent the tray rebounding, resilient buffers B, Fig. 6 are fixed to each side of the frame 1 and project into the path of the arms b. Angular lugs C Fig. 7 on the rod w engage the buffers as the rod rises and press them outward toward said arms when the latter swing inward and finally come to rest against the stops E. The tray a' is cut away below the plunger to permit the latter carrying the blank therethrough when it descends and also to permit the tray swinging away from the plunger into position to receive a new blank.

Adjacent one side of the frame 1 near one edge of the tray a' is a magazine 15 within which through an open side are placed a stack of blanks x supported on a vertically movable shelf 16 guided by the frame 17, 17^a of the magazine, one part 17^a of said frame being adjustable to accommodate blanks of various lengths. The open side of the magazine is closed by a gate 18 the details of which will be described hereinafter. Beneath the shelf 16 is an arm 19 slidably mounted on said shelf and projecting beyond one side thereof through which is formed a threaded opening for a hollow exteriorly threaded shaft 20, the rotation of which in opposite directions raises and lowers the shelf. At the opposite end of the arm 19, a latch 21 is provided to secure said arm to the shelf 16.

The hollow threaded shaft 20 is journaled in bearings on the magazine frame 17 and has affixed on its lower end a ratchet wheel 22, intermittently rotated by a spring actuated pawl 23 pivotally mounted on a horizontally rocking lever 24 turning freely on the shaft 20 and actuated through a link 25 connected to a finger 24^a on the hub of the lever 24, by an arm 26 on one end of a short shaft 27 supported on the main frame 1. An arm 28 on the other end of the shaft 27 is connected to the lazy tongs 8 by a link 29, as clearly represented in Fig. 1. The lazy tongs, it will thus be evident, operates the blank feeding mechanism and blank folding mechanism at the same time, so that whenever the plunger 4 is halted the feeding of blanks will also be stopped.

In a guide 30 supported by the magazine frame 17 above the magazine is a feeding bar 31, slidable in said guide in a direction lengthwise of the blanks and also having a limited vertical movement. Fastened to the underside of the feeding bar 31 are two brackets 32 in each of which is journaled a roller 33 preferably having a roughened surface in the form of a number of stud like projections. These rollers rotate freely in one direction but are prevented from turning in the opposite direction by ratchet wheels 34 and pawls 35. Each roller has attached to it one of the ratchet wheels 34 with which engages a pawl 35 pivoted on the underside of the feeding bar 31. The uppermost blank x bears against the rollers 33 and as the feeding bar moves toward the folding mechanism, the rollers held against rotation by the pawls and ratchets, draw said blank from the stack in the magazine and direct it toward the tray a' which has been swung outward in the manner heretofore described. On the return movement of the feeding bar 31 the rollers 33 revolve over the stack of blanks into position to feed another one into the tray.

The feeding bar is oscillated by means of a longitudinally vibrating lever 36 piv-

oted at one end on the magazine frame, its other free end passing below the feeding bar and having therein a longitudinal slot 37 into which projects a pin 38 extending downward from the under side of said feeding bar. Another longitudinal slot 39 is made in the lever 36 intermediate its ends to receive a pin 40 extending up from an adjustable arm 41 on the upper end of a rod 42 that passes downwardly through the hollow shaft 20 below the hub 43 of the rocking lever 24. A cross bar 44 on the lower end of the rod 42 is connected to ribs 45 on said hub and rocks said rod in unison with the lever 24, carrying the pawl 23. By means of the connections described at each upward movement of the lazy tongs 8 and plunger 4, the feeding bar 31 is moved to advance a blank toward the folding mechanism. A second horizontal lever 46 at one side of the lever 36 is pivoted at one end to the magazine frame 17 and lies across the top of the feeding bar 31. A pin 47 projecting up from said bar extends through a slot 48 in the free end of lever 46 and vibrates said lever as it, the bar, is moved back and forth. Fastened on the rocking arm 24 below the pawl 23 is a resilient plate 49 on the free end of which is a block or pad 50 in position when said plate is lifted to bear on a projection 51 from the pawl 23 and hold said pawl out of engagement with the ratchet wheel 22. A wire 52 or other connection extends from the resilient plate 49 upward to the lever 46 to which it is connected by a threaded pin and adjusting nut 53 for regulating the pressure of the block or pad against the pawl 23. When the pressure of the blanks against the rollers 33 is too great the feeding bar 31 is lifted a short distance. This raises the lever 46, pulling the wire upward and the block or pad 50 against the projection 51 on the pawl 23 with sufficient friction to hold said pawl against the force of its spring 54, away from the ratchet wheel 22, thus preventing the elevation of the shelf 16 and feeding of blanks to the folding machine.

The swinging gate 18 heretofore mentioned as retaining the blanks x within the magazine, is formed of an upright bar 55 hinged on the magazine frame 17, from which bar extend two parallel horizontal rods 56 to which is fastened a vertical rod 57 carrying on its upper end a yoke 58 in the arms of which is journaled a roller 59 on a horizontal axis, said roller bearing against one side of the stack of blanks. A similar roller 60 in fixed bearings contacts with the opposite side of said stack. The axes of the rollers 59, 60 are maintained in the plane of the uppermost blank, said rollers being rotated by the rising blanks as they are elevated by the shelf 16, and to prevent more than one blank being fed to the folding mechanism in case of a variation in the width of such blanks, the surfaces of the rollers are covered with some soft elastic material such as rubber, and preferably have their surfaces covered with small projections arranged thereon in lines inclined to the line of their axes, or in a spiral direction. Hair, wire, or other bristles may be employed in place of the rubber surfaces, said bristles being arranged in inclined lines similar to the small projections on the rubber surfaces. The gate 18 carrying the rollers 59 is held in closed position by means of a spring 61 applied as shown or in any other convenient manner.

The end of the feeding bar 31 farthest from the folding mechanism is provided with oppositely projecting studs 62 on each of which adjacent the bar 31 is secured a disk 63 having radially grooved outer faces as shown. Pivoted on the outer end of each stud 62 is an upright finger 64, on each of which in turn is pivoted one end of an arm 65, the opposite ends of which arms each carry a hollow shoe 66 open on its under side by means of which shoes an adhesive is applied to the blank. From each shoe a flexible tube 67 extends to a tank or receptacle 68 containing a liquid adhesive that flows down the tubes to the shoes, the flow being regulated by a faucet 69. The tubes 67 are sufficiently long and flexible to permit the shoes traveling to and fro over the blanks without hindrance. A coil spring 70 surrounds each stud 62, one end of each spring engaging one of the fingers 64 their other ends engaging a groove in the faces of the disks 63. These springs hold the shoes firmly upon the uppermost blank. A spring 71 connected to a short arm 72 on each shoe carrying arm 65 keep the shoes at the outer edges of the blanks, their position being controlled by plates 73 fastened to the spindles of the rollers 59, 60. The shoes 66 are swiveled on their carriers so as to adjust themselves at all times to the surface of the blanks. By this means the proper application of adhesive is insured in the event of buckling or curving of the blank.

Between the reciprocating feed bar 31 and the transverse feeding tray a' are two feed rollers 74, 75, between which the blank passes, and by which it is fed into said tray. The feed rolls are driven by a belt 76 passing around a pulley 77 on the shaft of the roller 74, and a pulley 78 on a shaft 79 upon which is mounted the driving pulley 80. Gear wheels 81, 82 impart motion from the shaft 79 to the shaft 6 upon which the cam 11 is secured.

In operating the machine a stack of blanks is placed within the receptacle upon

the support 16 which has been previously lowered to the bottom of said receptacle and afterward raised until the top of the stack bears against the rollers 33. The gate 18 is then closed so that the roller 59 carried thereby bears against one edge of the stack while the other edge of the stack is in contact with the roller 60. Motion being now imparted to the shaft 79, the rotation of the cam 11 operates the lazy tongs 8 to cause the plunger 4 to move vertically in the manner described in my aforesaid copending application. The vertical movement of the lazy tongs through the link 29, lever 28, and connecting parts, oscillates the arm 24 to cause the pawl 23 carried thereby to intermittently rotate the ratchet wheel 22 that, turning the screw 20, slowly elevates the blank support 16. The rod 42 extending through the hollow screw shaft 20 through its connection to the arm 24 is oscillated simultaneously therewith and imparts a rocking motion to the lever 36, which through its connection to the reciprocating feed bar 31 causes the latter to move back and forth in a straight line over the stack of blanks feeding the uppermost blank at each forward movement beneath the adhesive applying devices to the feed rollers 74, 75, which rollers further advance the blank into the transverse feeding tray a'. Should the upward pressure of the stack of blanks against the feed bar 31 be sufficient to lift said bar, the lever 46 projecting thereover will also be lifted and through the wire or other connection 52 the spring plate 49 will be raised and the friction pad 50 pressed against the pawl 23 with sufficient force to hold the latter out of engagement with the ratchet wheel 22, thus stopping the rotation of the feed screw 20 without interrupting the reciprocating movement of the feed bar 31, which as heretofore stated is given motion direct from the arm 24.

As the feed bar 31 moves rearwardly, the adhesive applying shoes 66 are held down upon the pile of blanks through the action of springs 70, and at a proper distance from the edges of said blanks by a spring 71 and guide plates 73. The feed bar 31 reciprocates in the primary feeding line or direction and the support for the stack of blanks is arranged so that it supports the blanks with their longitudinal axes on this primary feeding line and superposed upon each other.

The blanks are fed in a longitudinal direction by the feed bar 31 during the downward movement of the plunger 4 carrying a previously fed blank to the folding devices. During this time the transverse feeding tray a' is in its outermost position directly in line with the longitudinally advancing blank, and remains in such position until the blank has been fed thereinto. Upon the rise of the plunger 4 the pin d', which lies in front of the rod w, and thereby maintains the tray a' in its advanced position, continues to bear against the front of said bar and the switch g until the latter rises above the pin, whereupon the spring b^4 quickly draws the tray a' rearwardly beneath the plunger 4 into position, ready for the next descent of the plunger. The upturned edges of the tray a' prevent the blank from getting out of position during the rapid movement transversely of the tray. A finger a^4 is provided at one end of the tray to serve as a stop for the incoming blank.

What I claim is:—

1. In a packet making machine, the combination with blank folding devices, of secondary feeding means for feeding the blanks transversely to the folding devices, devices for applying an adhesive to said blanks, and primary feeding means for effecting a movement of the adhesive applying devices relative to the blanks to apply the adhesive thereto and for transferring the blanks one at a time to the transverse feeding means.

2. In a packet making machine, the combination of means for feeding the blanks transversely to the folding devices, a support for a stack of blanks, devices for applying adhesive to said blanks, and means actuated coincidently with the packet making machine for effecting a relative movement between the stack of blanks and the adhesive applying devices and for transferring the blanks one at a time from the stack of blanks to a point beyond said adhesive applying devices, to the transverse feeding means.

3. In a packet making machine, the combination with blank folding devices, of means operated by said folding devices for feeding said blanks transversely to the folding devices, elevating means for supporting a stack of blanks, a reciprocating feeding means for transferring the blanks longitudinally and one at a time from said stack of blanks to the transverse feeding means, and means operated by the mechanism for actuating the folding devices for lifting said elevating means and reciprocating the feeding means.

4. In a packet making machine, the combination with blank folding devices including a reciprocating plunger, means for feeding blanks transversely to said folding devices, and means actuated by the means for reciprocating said plunger for drawing said blank feeding means quickly beneath the same during the retreat of the plunger and moving said feeding means away from the plunger by a slower movement during the advance of the same.

5. In a packet making machine, the combination with blank folding devices includ-

ing a reciprocating plunger, actuating means for said plunger, a swinging tray for feeding blanks transversely beneath the plunger, a movable switch carried by the plunger reciprocating means adapted to coact with a projection fixed to said tray for imparting to the tray a quick movement to place a blank beneath the plunger, and a slower movement to carry said tray into position to receive another blank.

6. A feeding device for packet making machines comprising a support for a stack of blanks, a reciprocating feed bar above said stack against which said blanks are compressed, adhesive applying devices carried by said feed bar and adapted to reciprocate therewith, and means for holding said adhesive applying devices upon the uppermost blank of said stack, said means also permitting universal individual movement of each adhesive applying means to adapt the same to any irregularities of the blank.

7. A feeding device for packet making machines, comprising a support for a stack of blanks, a reciprocating feed bar above said stack against which said blanks are pressed, adhesive applying devices universally connected to said bar and adapted to reciprocate therewith, resilient means for holding each of said adhesive devices upon the uppermost wrapper and independent resilient means for keeping said devices spaced apart.

8. In a packet making machine, the combination with blank folding devices including a plunger, of a blank holding magazine provided with elevating means for a stack of blanks to maintain the top of the stack at a substantially constant level, a feed bar movable longitudinally over said stack to engage and carry the uppermost blank to the folding devices, and adhesive applying shoes movable with said feed bar and pivotally connected thereto adapted to swing independently in vertical and horizontal planes.

9. In a packet making machine, the combination with blank folding devices including a plunger, of a blank holding magazine provided with elevating means for a stack of blanks to maintain the top of said stack at a substantially constant level, a feed bar movable longitudinally over said stack to engage and carry the uppermost blank to the folding devices, adhesive applying shoes movable with said feed bar and pivotally connected thereto adapted to swing independently in vertical and horizontal planes, a guide plate for maintaining each shoe in proper position upon the blank, and resilient means for holding said shoes against the guide plates.

10. In a packet making machine, the combination with blank folding devices including a plunger, of a blank holding magazine provided with elevating means for a stack of blanks to maintain the top of said stack at a substantially constant level, a feed bar movable longitudinally over said stack to engage and carry the uppermost blank to the folding devices, adhesive applying shoes pivoted to said feed bar adapted to swing independently in vertical and horizontal planes, and to reciprocate simultaneously with said feed bar, and resilient means for holding said shoes yieldingly on the blank that they may follow all irregularities therein.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WALTER E. MOLINS.

Witnesses:
JOSEPH V. MOORES,
WILLIAM HOLMES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."