

Nov. 11, 1958

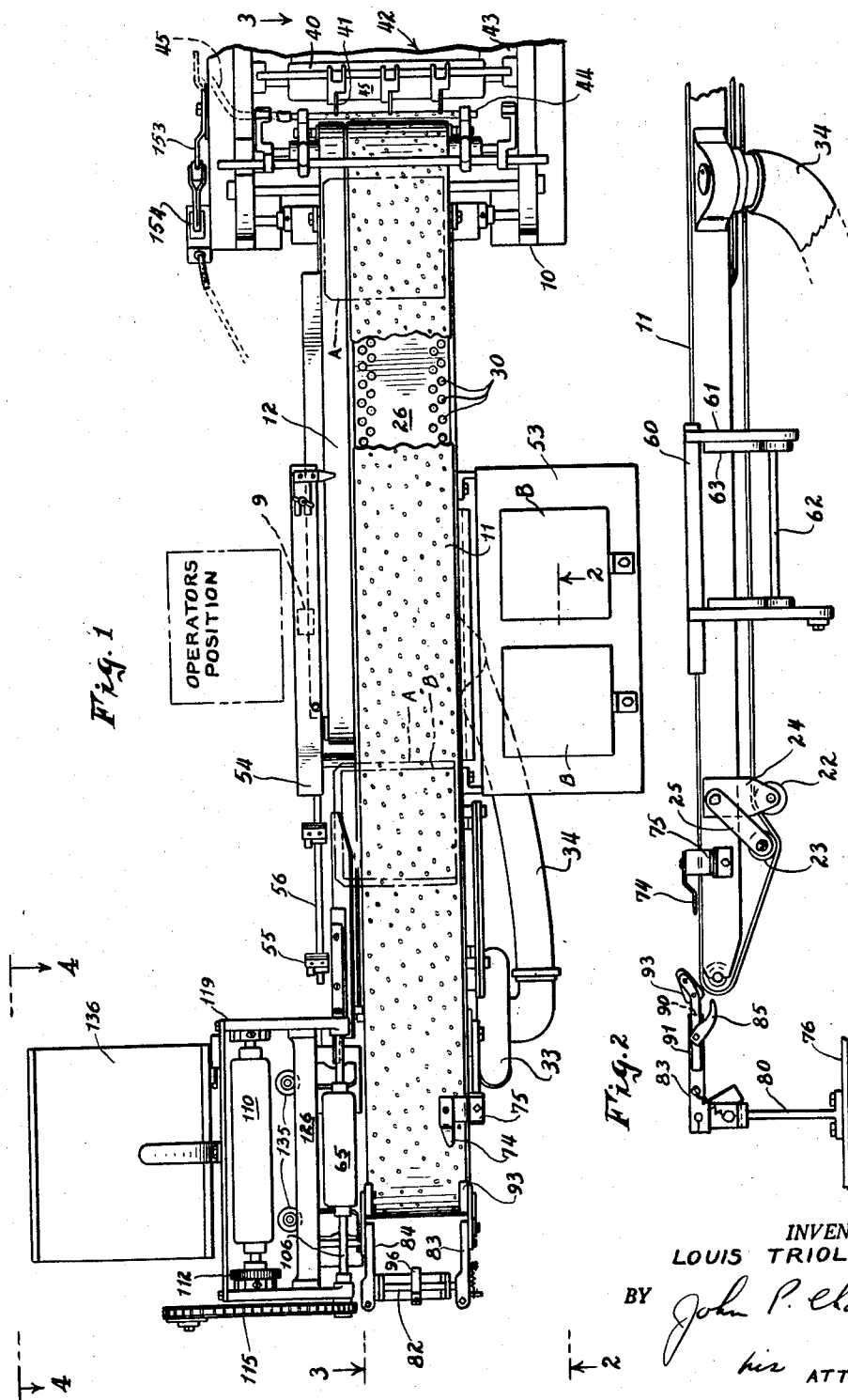
L. TRIOLO

2,859,672

ENVELOPE MAKING MACHINE

Filed May 10, 1956

4 Sheets-Sheet 1



INVENTOR.
LOUIS TRIOLO

BY *John P. Chandler*
his ATTORNEY

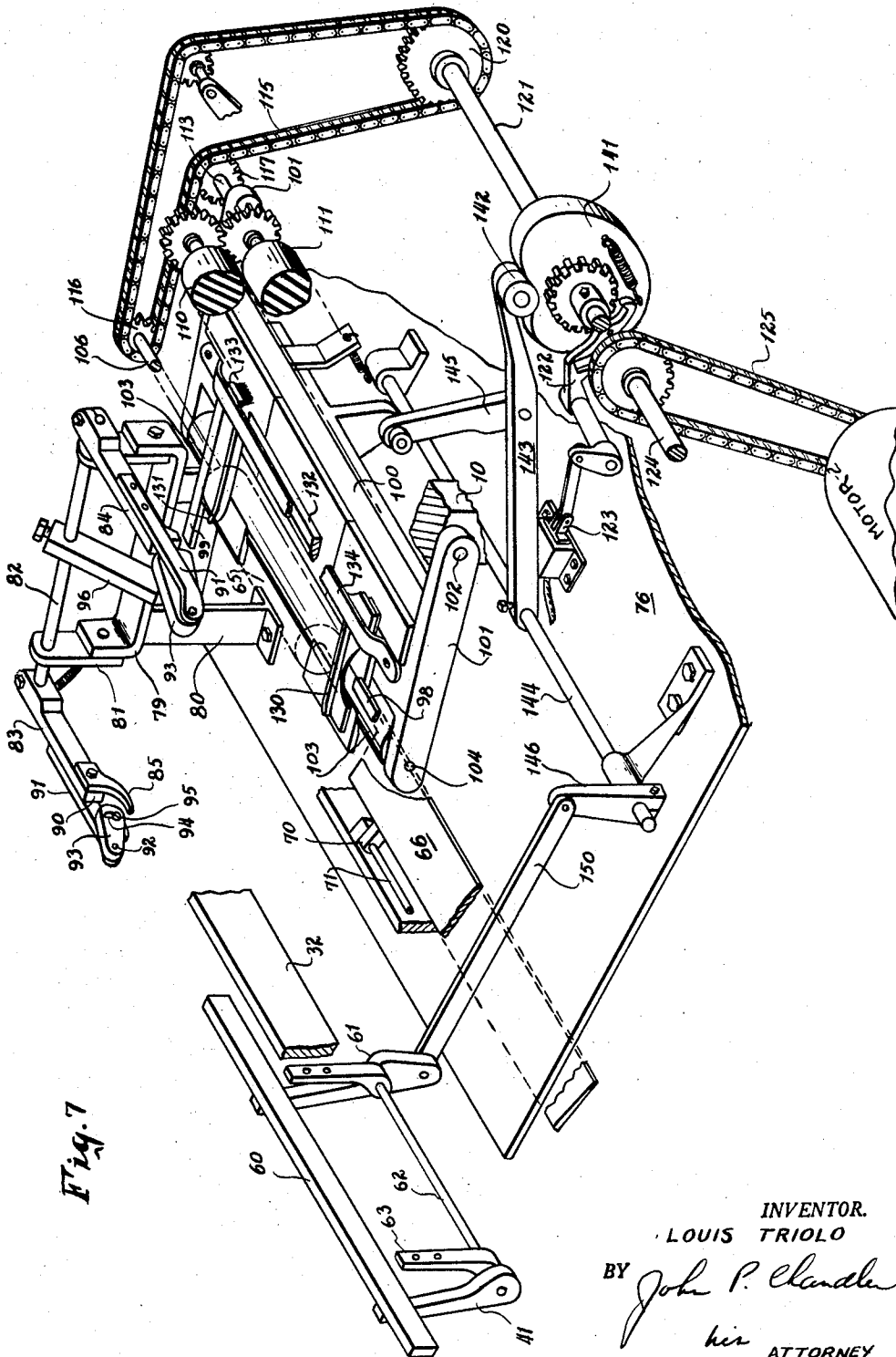
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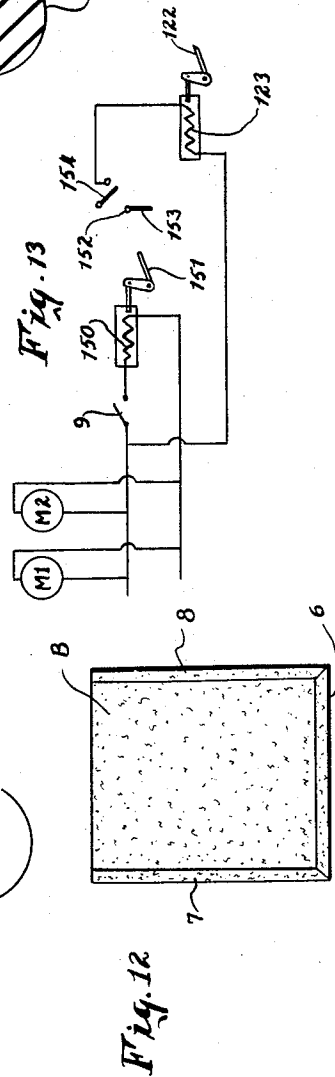
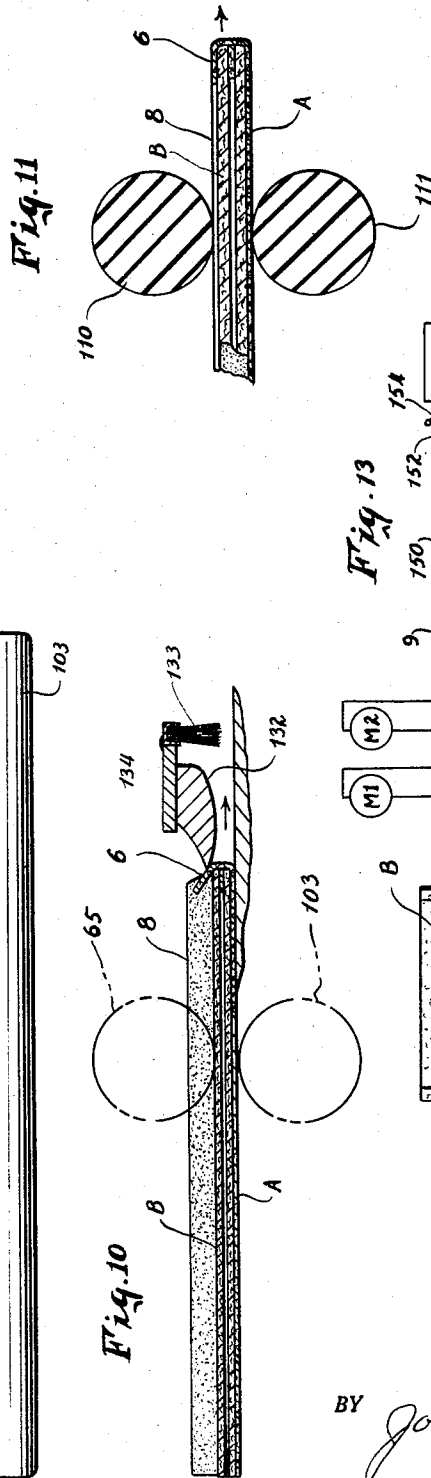
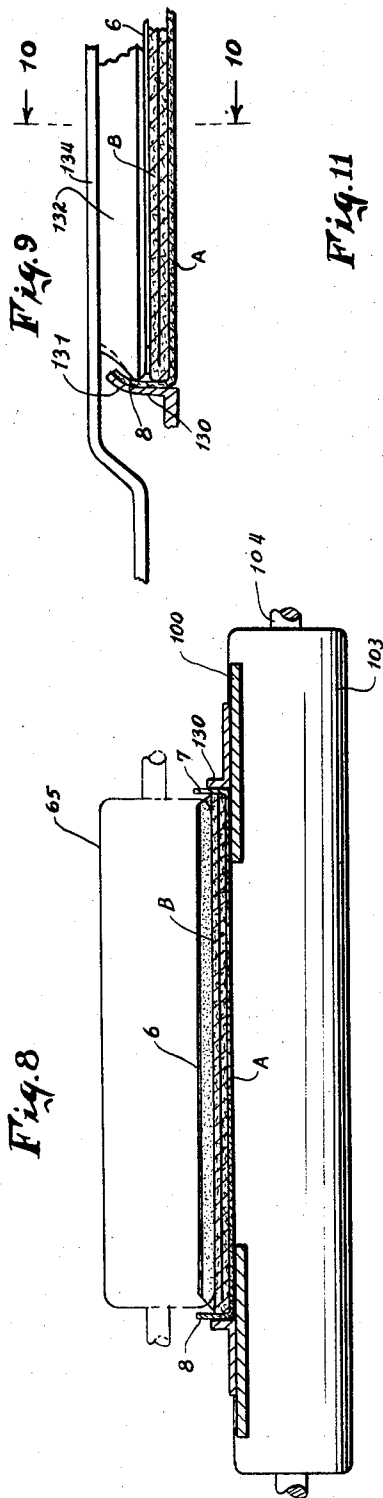
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LOUIS TRIOLO

BY *John P. Chandler*
his ATTORNEY

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ENVELOPE MAKING MACHINE

Louis Triolo, Brooklyn, N. Y.

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4 Claims. (Cl. 93—61)

This invention relates to envelope making machinery and relates more particularly to an improved machine for making phonograph record envelopes wherein a pocket is formed from a rectangular cardboard blank having a central transverse crease line and which is folded along this crease line to provide two opposed walls. A square liner or wrapper blank having flaps along three edges and an all-over adhesive coating is applied to the outer face of one wall and the flaps folded and secured around the margin of the opposite wall, thus forming an envelope which is closed on three sides. A paper label is then secured to the side of the envelope having the flaps but this label is not applied by the machine of the present invention.

The envelope, which is made by the machine of the present invention, is designed primarily for long playing records which, because of their relatively high price, merit a housing of stouter construction and affording greater protection to the faces of the record than does the older type of paper envelope.

Before the machine of the present invention envelopes of this type were either made entirely by hand or they required two machines, each with an operator. One of the machines had an endless conveyor belt and a glue applying assembly. The paper blanks were delivered, usually by suction means, from the top of a pile to the glue roller and thence to the conveyor, glue side up, where one operator placed the folded cardboard blank on the paper liner blank in proper register. A folding-in machine was located adjacent the delivering end of the conveyor and the second operator grasped the assembled structure and manually fed it to the rollers of a folding-in machine.

An important object of the present invention is to provide a machine wherein the only manual operation is to place the folded cardboard blank on the paper blank, all the remaining operations being performed automatically.

Another object of the invention is to provide a novel conveyor arrangement for a machine of this character which consists essentially of two endless conveyor belts arranged in side-by-side relation. At the starting end both belts are supported on the same roller or on two rollers in axial alignment. The second belt immediately in front of the operator, which is narrower than the first belt, stops short of the first belt, which latter extends the full length of the machine.

The combined width of both belts, there being only a slight space therebetween, is slightly greater than the liner blank and the operator in placing the cardboard or body blank on the liner first contacts that portion of the liner which overlies the short conveyor immediately in front of her. Without the support afforded by this belt it would be difficult to properly position the blank on the liner.

The first belt is of sufficient width to adequately support the assembled blanks, and further support is afforded by suction holding means associated with this first belt. Thus, after the assembled blanks leave the second or

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shorter belt there is an unsupported margin of this laminated structure, facing in the direction of the operator, which is presented to the rollers of the folding assembly which grasp this margin and feed it to the assembly in a direction at right angles to its initial line of travel.

This novel arrangement cures one of the foremost difficulties in the box lining art, namely, in removing a laminated structure having unadhered glue flaps from a conveyor. This unsupported margin overhangs the edge of the belt and two rollers, upper and lower, close upon this margin and feed it at right angles to its original direction of travel to the flap creasing and pressing assembly. Thus, by providing the two conveyors of unequal length and terminating the one nearest the operator after it has performed its function, the operation is speeded up considerably and there is little chance of jamming action.

A further object of the invention is to provide improved means for securing proper positioning of the combined blanks on the conveyor and for retaining this position.

Yet another object of the invention is to provide an improved stop for the assembled blanks travelling on the conveyor which corrects any misalignment which may have occurred, notwithstanding the earlier positioning and holding means, and which permits delivering of the laminated structure to the flap folding and creasing assembly without injury to the unadhered glue flaps.

Another important object of the invention is to provide a combined machine, first, for assembling blanks and applying glue to one of the blanks, and second, for folding and creasing the glue flaps wherein the second operation is synchronized with the first and this second operation also controls operation of several other functions including aligning and pressing the blanks.

In the drawings:

Fig. 1 is a plan view of the machine of the present invention.

Fig. 2 is a broken side elevation of the outer side of the right-hand end of the machine when viewed as in Fig. 1.

Fig. 3 is a longitudinal section taken on line 3—3 of Fig. 1.

Fig. 4 is a side elevation taken on line 4—4 of Fig. 1.

Fig. 5 is a section taken on line 5—5 of Fig. 3.

Fig. 6 is a broken perspective view of the conveyor belt and showing an outer or wrapper blank and also the two blanks in assembled relation and which form the laminated structure earlier referred to.

Fig. 7 is a broken perspective view of the blank positioning and stop mechanism and the creasing and roller assembly.

Fig. 8 is a broken section showing the feed rollers for the assembled blanks and the flap creasing means.

Fig. 9 shows the flap partially folded over the upper cardboard wall of the envelope.

Fig. 10 is a broken section taken on line 10—10 of Fig. 9.

Fig. 11 is a broken section showing the setting rollers which apply the final pressure to the glue flaps.

Fig. 12 is a plan view of the envelope made by the machine of the present invention.

Fig. 13 illustrates a circuit for operating the moving parts in timed sequence.

The two blanks, A and B, which are operated on by the machine of the present invention are shown in Fig. 6. Blank A is a liner or wrapper and has an all-over adhesive coating when it is deposited on the two belt conveyors. Blank B is made from heavier cardboard of double the size shown and is folded along a crease line 5 to form two walls. The size of blank A is such as to leave a front margin or flap 6 and side margins 7 and 8 when blank B has been applied thereto.

Intermittent movement of the conveyor belts for a predetermined distance of travel is under the control of

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the operator who closes a foot switch 9 which actuates a one revolution clutch on a motor driven assembly and applies glue to blank A and feeds it to the conveyor and also drives the conveyors a predetermined distance. Part way through this cycle a second circuit is closed which actuates a one-revolution clutch at the opposite end of the machine and starts a cycle wherein several operations are performed including removal of the blanks from the conveyor, folding the unadhered flaps inwardly, pressing them into engagement with the upper face of the cardboard blank and then discharging the finished article. Thus, the second operation is synchronized with the first and at the moment the combined blanks arrive at the feeding position for the flap creasing and pressing assembly, the feeding rollers close upon the overhanging margin of the combined blanks and feed them to the creasing and pressing assembly.

The machine of the present invention includes a frame 10 and two endless conveyor belts 11 and 12. Belt 11 is longer than belt 12 and is supported at opposite ends thereof on rollers or idlers 13 and 14. At one end of the machine the belts are driven by pressure rollers 15 and 16 which are driven a predetermined distance by a constantly rotating motor (not shown) having a conventional one-revolution clutch assembly. A flanged guide roller 20 at this end of the machine is mounted on an arm 21 supported on the frame, such guide roller engaging the inner edge (i. e., the edge facing the operator) of the conveyor belt 11. A similar guide roller (not shown) may be positioned at the opposite side of belt 11.

At the opposite end of the machine slack is removed from belt 11 by idler rollers 22 and 23 supported on fixed arms 24 and adjustable arms 25 respectively. The upper course of conveyor 11 travels on an elongated platen 26 which is perforated at 30 and forms the upper wall of a closed chamber having a bottom wall 31 and side walls 32. Negative pressure is created in the chamber by a vacuum pump 33 connected to the chamber by a conduit 34.

Belt 11 is formed with a larger number of smaller perforations 35 and accordingly when the wrapper blanks A are deposited on the conveyor they retain their relative position during travel because of the suction. The blanks A are fed from a supporting platen (not shown) to a glue applying roller 40 and fingers 41 guide the blanks in its travel from the glue roller to the conveyor. The motor which drives the conveyors may also drive the blank feeding means for the glue applying assembly.

The specific construction of this glue applying assembly 42 forms no part of the present invention and suffice it to say that it includes a glue pot 43 and a perforated tube 44 connected with a source of compressed air through a conduit 45 which disperses steam from the glue which would otherwise collect on the conveyor. A pivoted nose 46 at this end of the conveyor 11 can be raised to the dotted line position of Fig. 3 by moving lever arm 50, in order to gain access to the glue applicator.

The shorter conveyor belt 12 is supported at one end on roller 13 or on a separate roller generally aligned therewith and at its opposite end on a roller 51 which is located just to the right of the operator.

At each cycle of operation a wrapper blank A is fed to the conveyors and they are thus deposited thereon in spaced relation, shown in Fig. 6, and they overlie both belts. A supply of creased cardboard blanks B is conveniently supported on a platen 53 opposite the operator and as the wrapper blanks A travel to the position of Fig. 6 the operator takes one of blanks B and places it in the position shown. A fixed elbow rest 54 aids the operator.

For the purpose of moving the assembled blanks to a proper position transversely of belt 11 prior to application of the creasing rollers two fixed stops 55 are mounted on a bar 56 just to the right of the operator. The assembled blank dwells momentarily adjacent said stops and at this instant a pusher bar 60 mounted on arms 61 moves

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toward the operator and pushes the blanks against the stops. Arms 61 are keyed to a shaft 62 supported on brackets 63 secured to the frame which in this instance comprises side wall 32 of the vacuum chamber.

By the time the blanks have reached this position they have left the shorter conveyor 12 leaving the forward margin thereof free for contact by a friction roller 65 which feeds the blank to the creasing rollers. For the purpose of achieving firmer adhesion between the two blanks just prior to this latter operation a presser plate 66 mounted on arms 70 carried on shaft 71 moves upwardly, pressing the blanks against an upwardly yieldable top plate 72 supported on an arm 73.

The blanks pass under a spring finger 74 mounted on bracket 75 which produces a slight drag on the blanks just before they encounter the combined stop and lifter now to be described. A fixed platen 76 (Fig. 7) supported on the frame provides a support for a bracket 80 carrying a U-shaped frame 79 at its upper end which supports bearings 81 for a shaft 82. Arms 83 and 84 are keyed to this shaft and they are identical except that only arm 83 carries a finger 85 forming a lifter for the outer end of margin 8 of the wrapper blank and which does lift this margin just as it is about to commence its travel through the rollers. The face 90 at the free end of each arm is in line with edge 5 of blank B and forms a final stop therefor.

Arms 83 and 84 carry elongated bars 91 and pins 92 at the outer ends thereof forming pivotal supports for blocks 93 having downwardly inclined lower surfaces which bend margin 8 of blank A downwardly to prevent this margin from interfering with stop faces 90. The opposite end of blocks 93 have slots 94 which receive fixed pins 95. These blocks as well as stops 55 earlier referred to are preferably made from some of the newer plastics on which glue will not deposit. One such plastic is currently sold under the trademark "Teflon."

The blocks 93 are shown in Fig. 7 in their raised position but they are normally in their downward position due to gravity. Downward movement of arms 83-84 is limited by a lever 96.

The roller assembly will now be described. A platen 100 having arms 101 is pivoted at 102 on the frame. This hinged platen carries a finger 99 which, when the platen is raised contacts arm 84 and raises the same. It also carries a bar 98 which may be an extension of presser plate 66 which then raises, as earlier described, to initially press the body blank against the liner in the blanks which have not yet reached the creasing assembly. The platen also supports a freely rotatable lower roller 103 carried on a shaft 104. When the blanks are stopped the inner margins thereof are positioned just above lower roller 103. When the platen is then raised it moves this inner margin against the driven upper friction roller 65 mounted on shaft 106 journaled in the frame on a fixed axis. Roller 103 pressing the blanks against driven roller 65 starts their rearward travel to the creasing rollers shown at 110 and 111. The shafts on which these rollers are mounted carry gears 112 and lower shaft 113 has a sprocket 114 driven by a chain 115 which also drives sprocket 116 for upper driving roller 65.

This chain is driven by a sprocket 120 on shaft 121 which has a one-revolution clutch assembly including a release lever 122 which is actuated by a solenoid 123. A shaft 124 associated with the clutch is driven by a chain 125 from the motor.

The shafts for the rollers are journaled in side frames 119 having a connecting frame 126. During this rearward travel the glue flaps 7 and 8 of blank A first encounter folding-up brackets 130 mounted on pivoted platen 100 and which are inwardly curved at their trailing ends 131 (Fig. 9). This operation is shown in Fig. 8. At the same instant flap 6 encounters a curved presser plate 132 which wipes this flap downwardly and a

brush 133 aids in pressing it down. This presser plate is mounted on a bridge 134 and has inwardly curved side edges which cooperate with curved surface 131. Continuing its travel flaps 7 and 8 are wiped downwardly and flaps 7 and 8 now encounter rollers 135 (Fig. 1) which apply considerable pressure. Finally the folded flaps 6, 7 and 8 pass through resilient rollers 110 and 111 for the final pressing operation (Fig. 11) and the finished article is deposited in a hopper 136. A counter 140 gives the number of envelopes made by the machine.

Referring again to Fig. 7, when the one revolution clutch 122 is released by the solenoid which actuates release lever 122 a generally heart-shaped cam 141 engages a roller 142 carried at the outer end of an arm 143 keyed to a shaft 144. A lever 145 connects arm 143 with platen 100 to raise the same when cam 141 revolves from its starting position of Fig. 7. A lever 146 keyed to shaft 144 transmits motion from shaft 144 through link 150 to arm 61 on pusher bar 60.

Reference is now had to the circuit shown in Fig. 13. Motor M1 operating the conveyors and glue applier and motor M2 operating the creasing and presser assembly are constantly rotating. When the operator closes switch 9 a solenoid 150 operates the release arm 151 of a one-revolution clutch assembly. The shaft 152 which is thus turned one revolution moves the conveyor one increment of travel as well as the feeder for blank A. When this shaft 152 has completed part of its revolution an arm 153 carried thereby closes a switch 154 which energizes solenoid 123 which actuates the release arm 122 of the one-revolution clutch assembly.

This raises hinged platen 102 to cause lower roller 103 to raise and move the blank past the folding brackets 130 and through the pressing rollers 110 and 111. It also actuates pusher 60 and presser plate 66. While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that many modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of equivalency of the claims are intended to be included therein.

What I claim is:

1. A conveyor for a machine for making envelopes comprising a double walled body and a liner with glue flaps enclosing three sides of the body, said conveyor comprising a frame, a first endless perforated conveyor belt of lesser width than the liner, a vacuum chamber below the upper course of the belt to provide suction means for holding the liner blanks, and first and second rollers at opposite ends of the machine supporting said belt, means for applying glue to the liner blanks and depositing them on the belt, a second endless belt and supported at one end at the first roller, and a third roller between the ends of the frame supporting the opposite end of the second belt, the superimposed blanks forming a laminated structure which is supported over substantially its entire width during travel on both belts but leaving an unsupported margin after it leaves the second belt, means for imparting intermittent travel to the belts to permit the body blank to be applied to the liner blank, a pusher bar for correcting misalignment of said structure on first belt, a presser bar for promoting adhesive between the blanks, and means at the second roller for stopping travel of the structure comprising pivoted arms whose forward faces are engaged by the body blank and provided with means for lowering the forward unadhered glue flap, and means for raising said flap before the structure travels away from the belt.

2. A machine for making envelopes comprising a double walled body and a liner underlying the body with flaps

enclosing three sides thereof, said machine comprising a frame, a first endless conveyor belt of lesser width than the liner, and first and second rollers at opposite ends of the machine supporting said belt, a glue applicator for the liner blanks adjacent the first roller, and flap folding and pressing means at the second roller, a second endless belt supported at one end at the first roller, and a third roller between the ends of the frame supporting the opposite end of the second belt, the superimposed blanks forming a laminated structure which is supported over substantially its entire width during travel on both belts but leaving an unsupported margin after it leaves the second belt, a driven roller journaled on the frame above said margin and parallel with said first belt, a roller below said margin and movable upwardly to press the margin against the upper roller to move the laminated structure at right angles to said belt, said flap folding and pressing means comprising fingers for folding the flaps over the body blank and rollers for firmly pressing the flaps thereover.

3. A machine for making envelopes comprising a double walled body and a liner underlying the body with flaps enclosing three sides thereof, said machine comprising a frame, a first endless perforated conveyor belt of lesser width than the liner, and first and second rollers at opposite ends of the machine supporting said belt, a vacuum chamber below the upper course thereof for holding the liner blanks, flap folding and pressing means at the second roller, a second endless belt supported at one end at the first roller, and a third roller between the ends of the frame supporting the opposite end of the second belt, means for imparting intermittent travel to the belts, the superimposed blanks being supported over substantially their entire width during travel on both belts but leaving an overhanging margin after they leave the second belt, a roller journaled on the frame above said margin and parallel with said first belt, a roller below said margin and movable upwardly to press the margin against the upper roller to move the laminated structure at right angles to said belt, one of said rollers being driven, fingers for folding the flaps over the body blank and rollers for firmly pressing the flaps thereover, and means for synchronizing operation of the folding and pressing means with travel of the belts.

4. A conveyor for a machine for making envelopes comprising a double walled body and a liner with glue flaps enclosing three sides of the body, said conveyor comprising a frame, a first endless conveyor belt of lesser width than the liner, and first and second rollers at opposite ends of the machine supporting said belt, a second endless belt which is supported at one end on the first roller, and a third roller between the ends of the frame supporting the opposite end of the second belt, the liner and the body which is superimposed thereon forming a laminated structure which is supported over substantially its entire width during travel on both belts but leaving an unsupported margin after it leaves the second belt, means for driving the conveyor belts for imparting intermittent travel to the liner blank, and means at the second roller for stopping travel of the structure comprising pivoted arms whose forward faces are engaged by the body blank and provided with means for lowering the forward unadhered glue flap, and means for raising said flap before the structure travels away from the belt.

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