Dec. 19, 1939. N. A. ANDERSON 2,183,951

CARTON ASSEMBLING MACHINE

Filed Feb. 14, 1938 2 Sheets-Sheet 1

Fig. 1

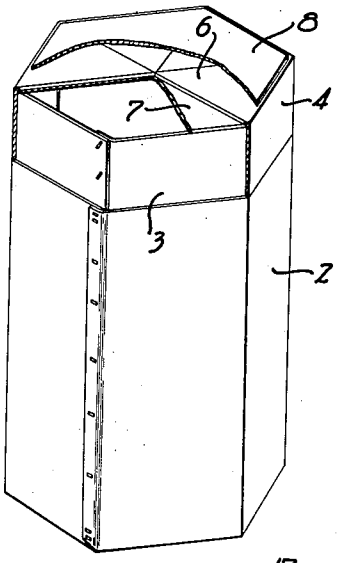

Fig. 2

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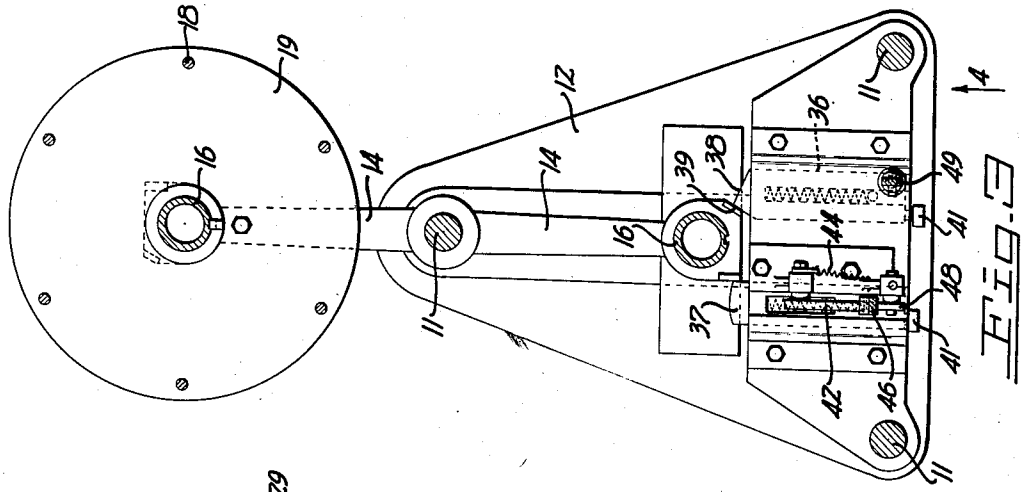

FIG. 3

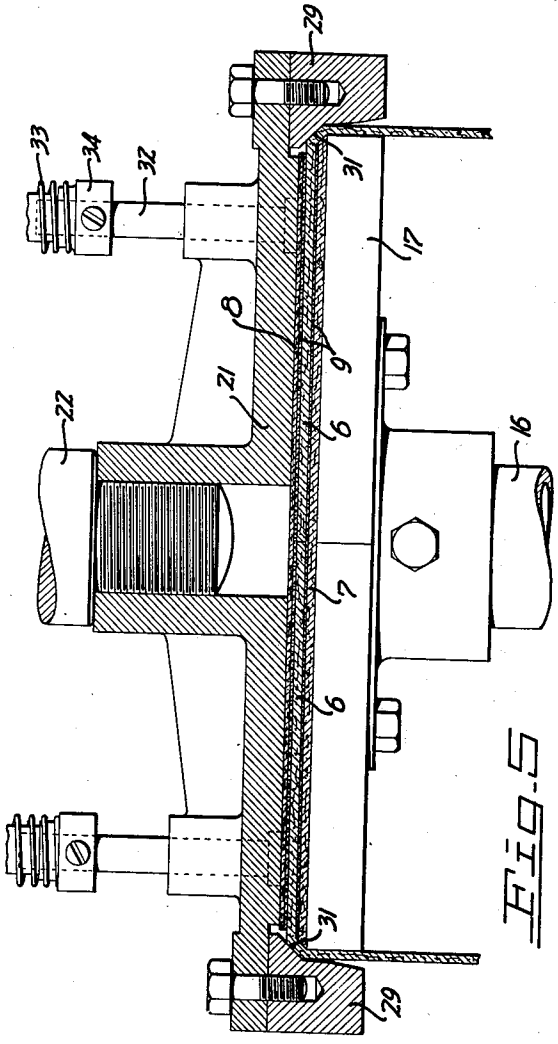

FIG. 5

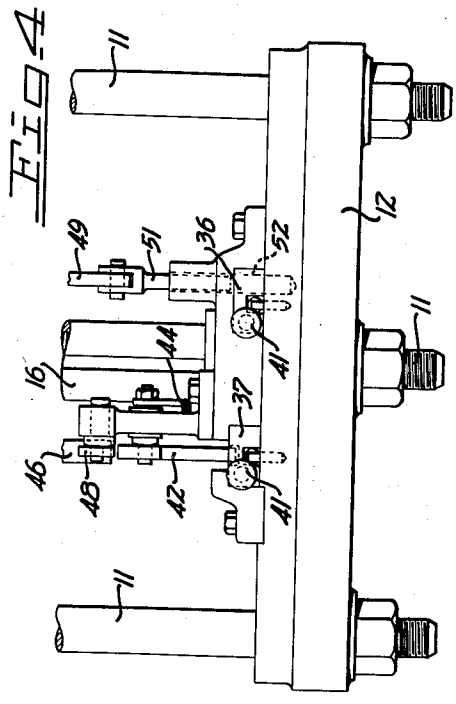

FIG. 4

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2,183,951

CARTON ASSEMBLING MACHINE

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Application February 14, 1938, Serial No. 190,388

7 Claims. (Cl. 93—36.3)

My invention relates to a machine for assembling a fibreboard carton having end tabs glued between head blanks to form a closure; and the broad object of the invention is to provide a machine to facilitate shaping the carton and for applying pressure to the glued parts of the closure.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to this disclosure of species of my invention as I may adopt variant embodiments thereof within the scope of the claims.

Referring to the drawings:

Figure 1 is a perspective view, partly in section and partly in elevation, showing the type of carton assembled by my machine, and

Figure 2 is a side elevation of the machine embodying my invention.

Figure 3 is a horizontal sectional view of the machine, taken in a plane indicated by the line 3—3 of Figure 2.

Figure 4 is a fragmentary side elevational view looking in the direction of arrow 4 of Figure 3.

Figure 5 is a detail sectional view on somewhat larger scale showing the pressure plates with a carton closure compressed therebetween.

In terms of broad inclusion, the machine of my invention assists in assembling cartons having infolded closure tabs glued to a head blank. The machine comprises a holder for the carton including a pressure plate underlying the head blank and closure tabs. A second pressure plate is also provided, and means are provided for moving one of the plates toward the other to compress the blank and tabs. Means are also provided for mounting the holder for movement from a setting-up position alongside the second pressure plate to an operative position underlying it.

Two holders are preferably provided and are so mounted that one is in the setting-up position to receive a carton while the other is in the operative position. Means are also provided for locking a holder in the operative position, and means are further provided whereby the plate moving means may be actuated only when a holder is in the operative position.

In greater detail, and referring to the drawings, Figure 1 shows the type of fibreboard carton operated upon by my machine. The carton or barrel comprises a hexagonal shaped tubular body 2 having a similarly shaped liner 3. The latter is frictionally held within the body and a cover 4 is slidably fitted on the projecting end of the liner. Cover 4 has a top or closure formed by triangular tabs 6 folded in from the side walls and glued between inner and outer head blanks 7 and 8. The bottom closure of the barrel is formed in a similar manner with infolded tabs on the lower edges of body 2 glued between a pair of head blanks, thus forming a structurally integral three-ply closure at both ends.

My machine is designed to facilitate assembly of such a carton, and more particularly to insure a firm adhesive bond between the layers 9 of glue between closure tabs 6 and head blanks 7 and 8. See Figure 5. Since the closure for the cover is the same as that at the bottom of the carton, both closures may be sealed by the same machine.

As shown in Figures 2 to 5, the machine comprises a frame having three vertical rods 11 connecting a triangular shaped base 12 with a top piece 13. A pair of holders for the cartons being assembled are mounted on the ends of oppositely disposed arms 14 journaled on one of the rods 11. Each holder comprises a vertical column 16 supporting a pressure plate 17 shaped to fit within the carton body 2 or cover 4 under the infolded tabs and head blanks. When the bottom closure is being formed the body 2 is placed on the holder in inverted position. A plurality of spreader fingers 18 are also provided on the holder, projecting upwardly from a plate 19, to engage within the corners of the tubular body. These fingers hold the walls extended and in proper shape while the closure is being formed.

As shown in Figure 2, one of the carton holders is in a setting-up position outside the frame while the other is in an operative position within the frame. This permits a new carton to be set up on the outside holder while the closure is being compressed on the inside holder. The carton is set up by an operator extending the walls and slipping it down over plate 17. A head blank 7 with adhesive on its upper surface is placed on the plate and tabs 6 are folded in against the adhesive surface, after which the head blank 8 with adhesive on its lower surface is placed over the infolded tabs. The adhesive holds the parts together while the unit is rotated into the operative position within the frame.

Means are provided for applying pressure to the closure to produce a firm adhesive bond between the parts. For this purpose an upper pressure plate 21 is mounted for reciprocation on the frame to compress the carton closure against plate 17 when a holder is in the operative position. Upper plate 21 is fastened to the end of a plunger 22 carrying a piston 23 sliding in a cylinder 24. The latter is suspended from the top of the frame, and has ducts 26 ported into the cylinder ends for admitting a suitable pressure fluid. A valve 27 connected with the ducts provides means for controlling the fluid, so that when the valve handle 28 is at the right, as viewed in Figure 2, the plunger is up, and

when the handle is shifted over to the left the fluid is admitted into the top of the cylinder to force the plunger down.

Flanges 29 are fastened to the lower edges of the upper pressure plate for engaging the carton rim to hold tabs 6 inwardly as the closure is compressed. The flanges preferably have beveled surfaces 31 for pressing the corners down and in, as shown in Figure 5. Stripper means are also provided for forcing the carton down out of flanges 29 when the plunger goes up. This is accomplished by a series of pins 32 slidable in plate 21 with springs 33 compressed between collars 34 and the cylinder head. These pins are forced down when plate 21 elevates, thus insuring that the carton is not carried up with the plate.

Means are also provided for latching a carton holder in the operative position. The latch is mounted on base 12 and comprises a pair of slidably mounted spring pressed bars 36 and 37 between which the end of holder mounting arm 14 snaps. Bar 36 has a beveled strike face 38 for retracting the bar when arm 14 swings against it. The other latch bar 37 is also retractable and means are provided for pushing this bar back to free arm 14 when pressure plate 21 goes up. As soon as bar 37 is retracted arm 14 is pushed out over the end of the retracted bar by the lateral force exerted by inner beveled surface 39 on bar 36. Both latch bars are limited in their forward movement by the heads of screws 41 threaded in the rear ends of the bars.

The means for retracting latch bar 37 to release the holder comprises a bell crank 42 on the base having an arm thereof held against a pin 43 on the bar by a spring 44. An elongated element 46 fastened to plate 21 has a hooked end 47 backed by a roller 48 to catch under the crank arm when the plate goes up, thus effecting a momentary retraction of latch bar 37 and allowing the holder arm to be pressed out of the latch by the side pressure of latch bar 36. The operator may then rotate the other holder into latched position under the reciprocating pressure plate.

Means are further provided whereby the plunger can be brought down only when a holder is in the operative position. This safety device comprises a linkage 49 connected between valve lever 28 and a pin 51 slidable vertically in the base above latch bar 36 and depressable into a socket 52 in the latch bar. This socket is so arranged that it registers with the pin only when bar 36 is retracted by a holder being in the latch. Thus valve handle 28 can be thrown over to the left for driving down the plunger only when a holder is in the operative position.

I claim:

1. A machine for assembling cartons having infolded closure tabs glued to a head blank, comprising a holder for a carton including a pressure plate for underlying the head blank and closure tabs, a second pressure plate, means for mounting the holder for movement from a setting-up position to an operative position underlying said latter plate, means for moving one of the plates toward the other in the operative position to compress the blank and tabs, means for holding the plate moving means against operation, and means actuated by movement of the carton holder into operative position for releasing said holding means.

2. A machine for assembling cartons having infolded closure tabs glued to a head blank, comprising a holder for a carton including a pressure plate for underlying the head blank and closure tabs, a second pressure plate, means for mounting the holder for movement from a setting-up position to an operative position underlying said latter plate, means for reciprocating one of the plates to compress the blank and tabs, a latch for locking the holder in operative position, and means operable upon retraction of the reciprocable plate for releasing the latch.

3. A machine for assembling cartons having infolded closure tabs glued to a head blank, comprising a holder for a carton including a pressure plate for underlying the head blank and closure tabs, a second pressure plate, means for mounting the holder for movement from a setting-up position to an operative position underlying said latter plate, means for reciprocating the upper plate to compress the blank and tabs, and spring pressed stripper means for pressing the carton away from the upper plate upon retraction of the latter.

4. A machine for assembling cartons having infolded closure tabs glued to a head blank, comprising a holder for a carton including a pressure plate for underlying the head blank and closure tabs, a second pressure plate, means for mounting the holder for movement from a setting-up position to an operative position underlying said latter plate, means for reciprocating one of the plates to compress the blank and tabs, a pair of retractable spring pressed latch bars for locking the holder in operative position, one of said bars having a beveled end to permit the holder to snap into locked position between the bars, and means operable upon retraction of the reciprocable plate for retracting the other bar to release the holder.

5. A machine for assembling cartons having parts to be pressed together, comprising an arm pivotally mounted on a substantially vertical axis, a carton holder on the arm and adapted to swing between setting-up and operative positions, a pressure plate mounted for reciprocation in a fixed vertical path above said holder in its operative position, means for registering said holder with the pressure plate in said operative position, and means for moving said pressure plate against the carton on said holder.

6. A machine for assembling cartons having parts to be pressed together, comprising an arm pivotally mounted on a substantially vertical axis, a carton holder on the arm and adapted to swing between setting-up and operative positions, a cylinder mounted in fixed position above said holder in its operative position, the axis of said cylinder being substantially parallel to said pivot axis, a piston in the cylinder, and a pressure plate connected with the piston and movable against the carton on the holder in operative position.

7. A machine for assembling carton having parts to be pressed together, comprising a frame, an arm pivotally mounted intermediate its ends on the frame, a carton holder on one end of the arm and adapted to swing from a setting-up position outside the frame to an operative position within the frame, a carton holder on the other end of the arm and adapted to swing to the setting-up position as the other holder moves into said operative position, a pressure plate mounted for reciprocation on the frame, and means for moving the pressure plate downwardly toward a holder in the operative position to compress said parts of the carton.

NELS A. ANDERSON.