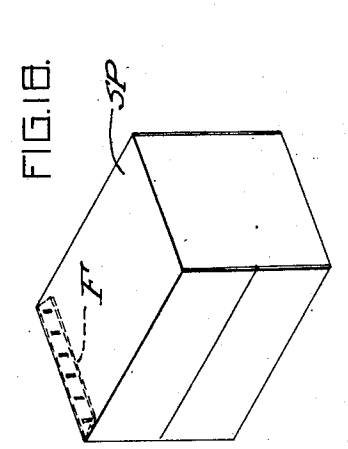
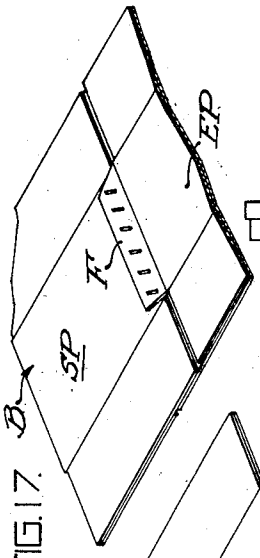
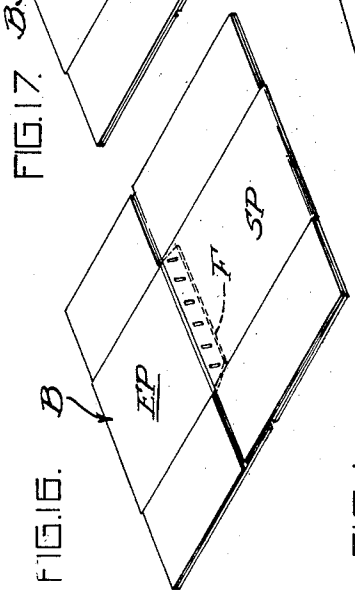
Oct. 13, 1959 J. H. MOTT 2,908,011

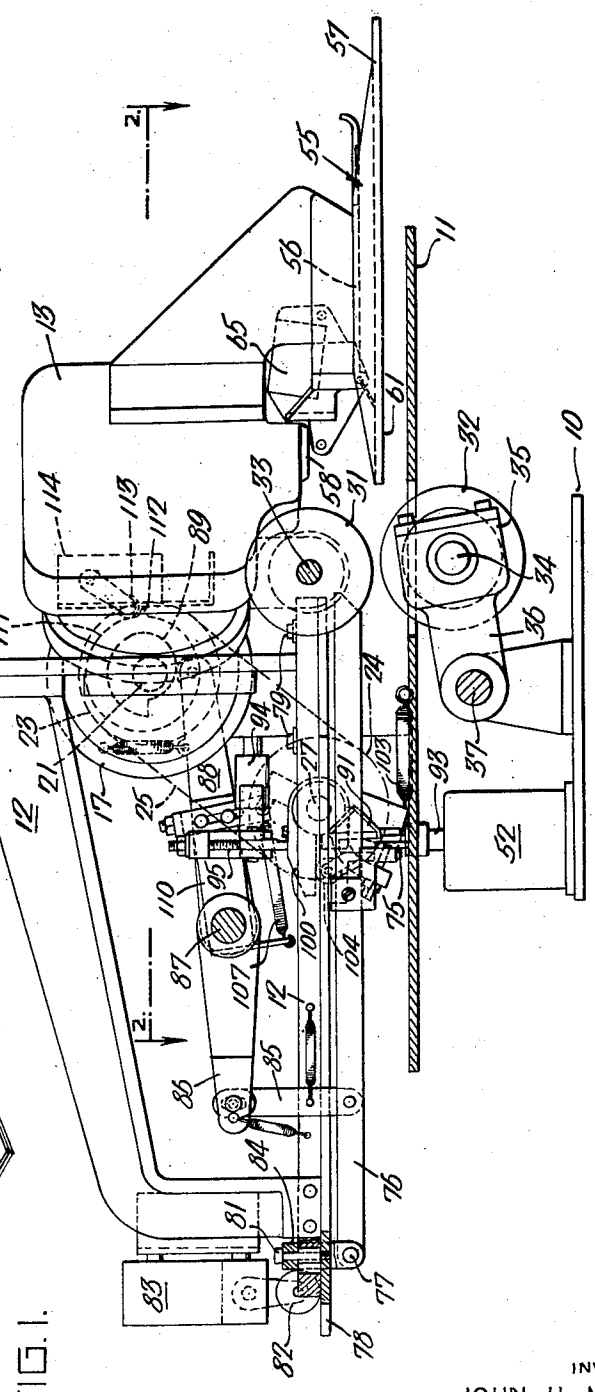
BOX STITCHING MACHINE

Filed Nov. 21, 1956 5 Sheets-Sheet 1









INVENTOR:
JOHN H. MOTT
BY
Howson & Howson
ATTYS.

Oct. 13, 1959 J. H. MOTT 2,908,011

BOX STITCHING MACHINE

Filed Nov. 21, 1956 5 Sheets-Sheet 2

FIG. 2.

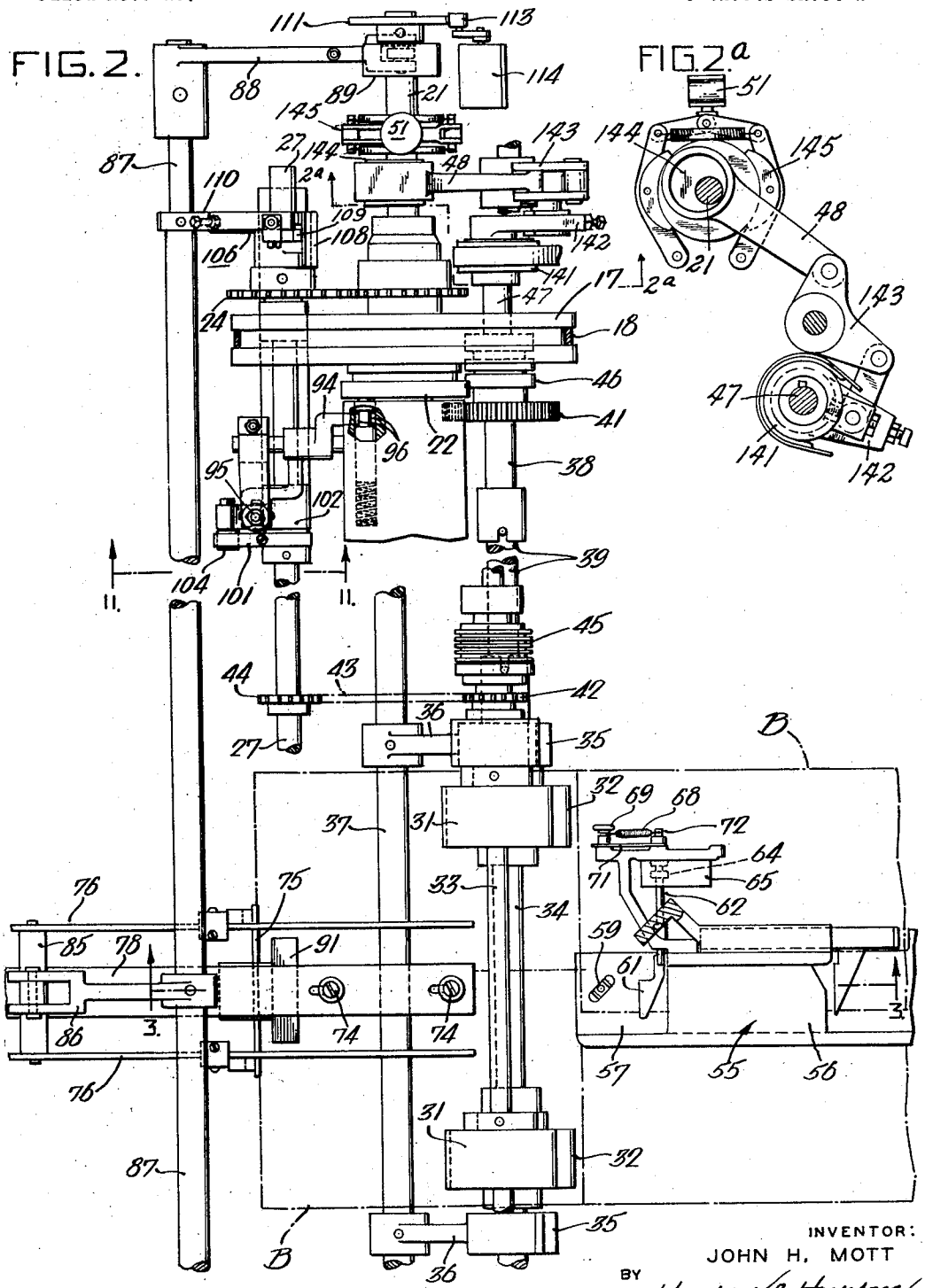


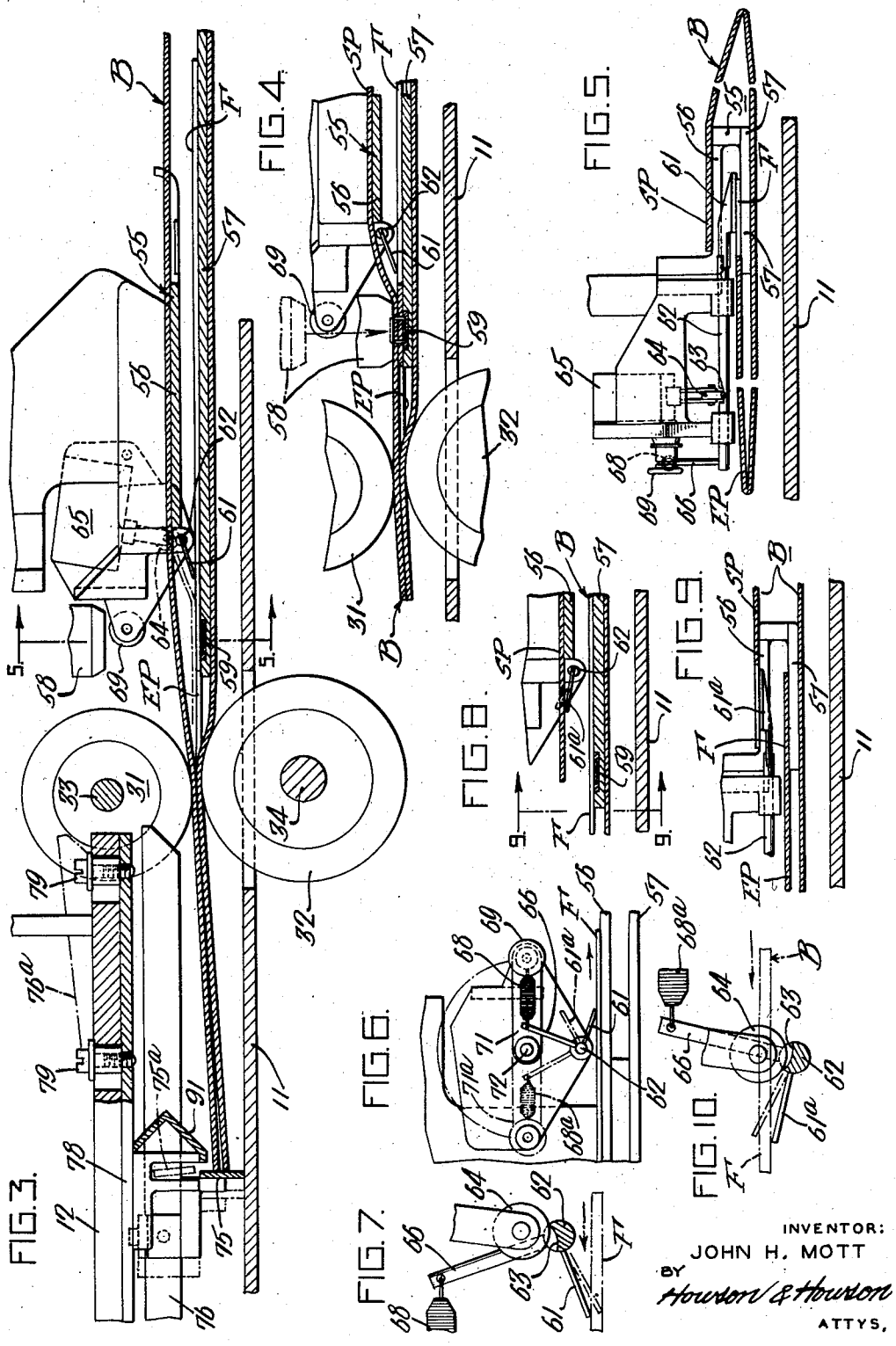
FIG. 2a

INVENTOR:
JOHN H. MOTT
BY
Howson & Howson
ATTYS.

Oct. 13, 1959 J. H. MOTT 2,908,011

BOX STITCHING MACHINE

Filed Nov. 21, 1956 5 Sheets-Sheet 3



Oct. 13, 1959 J. H. MOTT 2,908,011

BOX STITCHING MACHINE

Filed Nov. 21, 1956 5 Sheets-Sheet 4

FIG. 11.

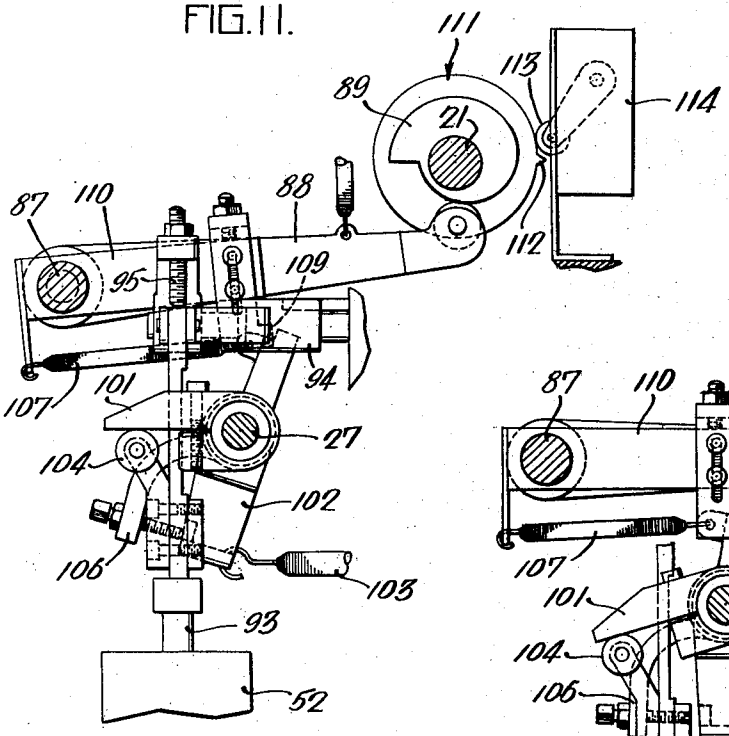


FIG. 12.

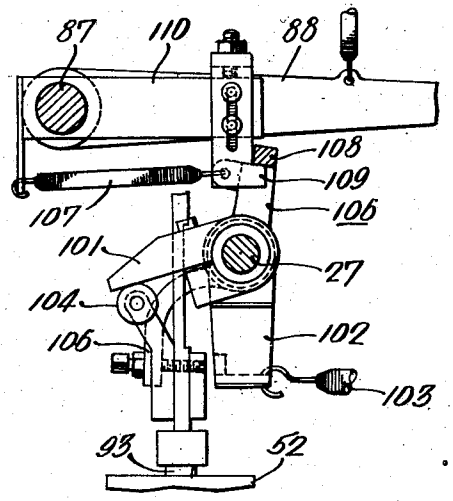
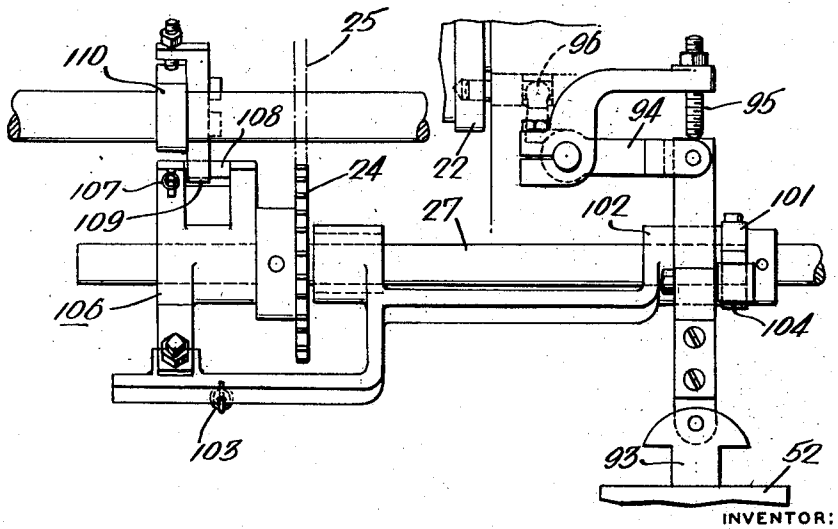


FIG. 13.



INVENTOR:
JOHN H. MOTT
BY Howson & Howson
ATTYS.

Oct. 13, 1959 J. H. MOTT 2,908,011

BOX STITCHING MACHINE

Filed Nov. 21, 1956 5 Sheets-Sheet 5

FIG. 14.

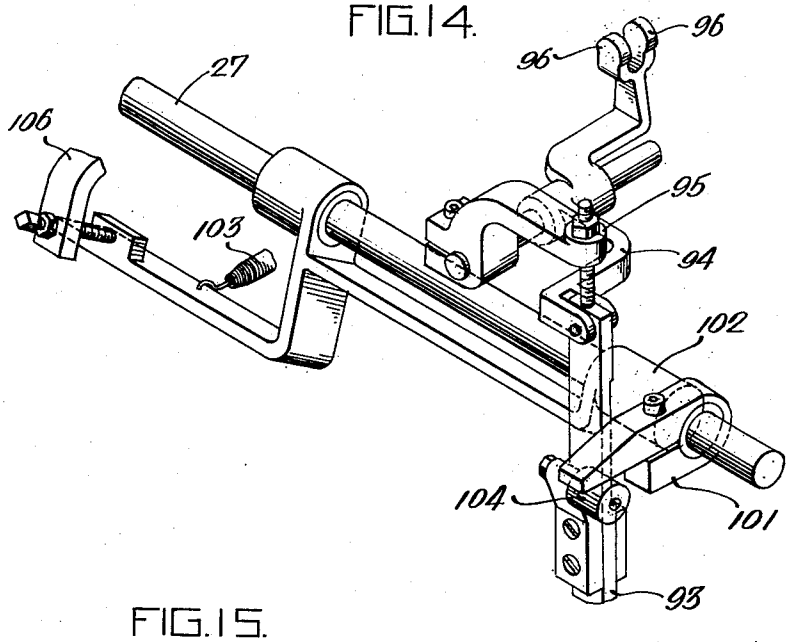
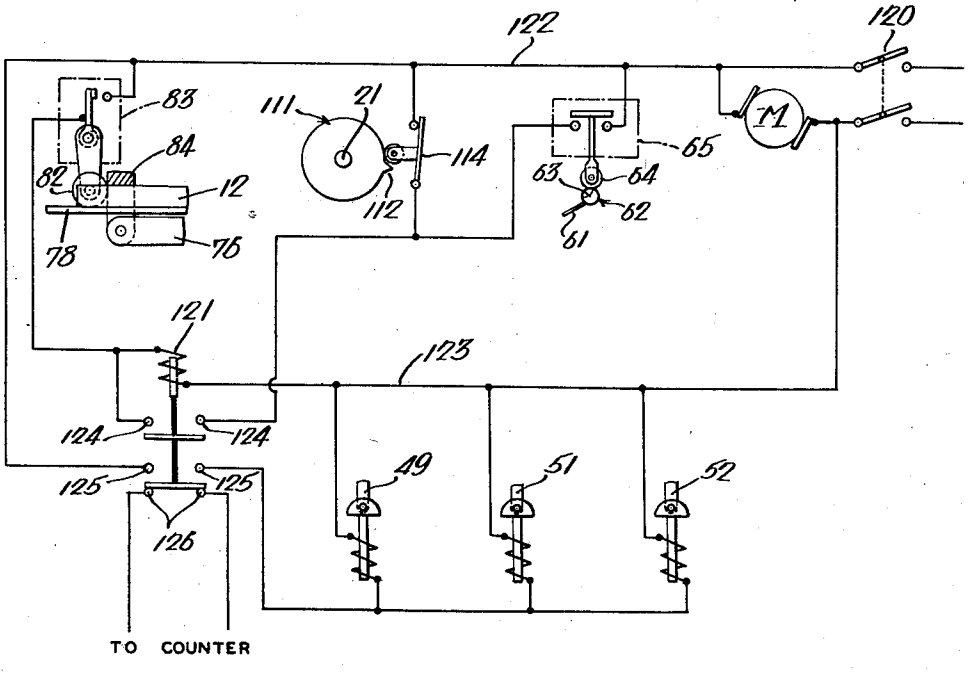


FIG. 15.



INVENTOR:
JOHN H. MOTT
BY
Howson & Howson
ATTYS.

United States Patent Office 2,908,011 Patented Oct. 13, 1959

2,908,011

BOX STITCHING MACHINE

John H. Mott, Wayne, Pa.

Application November 21, 1956, Serial No. 623,751

5 Claims. (Cl. 1—106)

The present invention relates to box stitching machines, and more particularly to machines for tubulating corrugated paperboard box blanks. The present invention is an improvement in machines of the type disclosed in U.S. patent to Harred, No. 2,305,419, dated December 15, 1942.

For machines of the stated type, box blanks are formed with four side panels each having end flaps at opposite ends thereof and which are interconnected by three fold lines. The blank is formed with a stitch flap hingedly secured to the free outer edge of one of the panels and adapted to be stitched in overlapping relation to the marginal edge of the remote side panel to thereby form a tubulated box blank. In conventional machines of this type, the box blank is advanced into engagement with a target in the machine at a continuous rate of feed. Upon engagement of the blank with the target, a series of switches are actuated which, in turn, change the feed of the box through the machine from a continuous feed to an intermittent feed; initiate operation of the stitcher head; and initiate operation of a counter mechanism. The counter mechanism counts the number of stitches and when a predetermined number of stitches have been made in the blank, the stitching head is arrested; the counter returns to its starting position; and the intermittent feed is stopped and the continuous feed is resumed to discharge the box blank from the machine. To insure proper stitching of the blank, it is necessary to accurately correlate the rate of feed and the counter mechanism. If the proper correlation is not obtained, insufficient or excess stitches are applied to the blank. In addition, the series of switches actuated by the target require precise adjustment, and the various mechanical and electrical parts are subject to premature failure necessitating frequent shutdowns for adjustment and repair.

With the foregoing in mind, the present invention contemplates an improved box stitching machine of simplified design which is fully effective in operation and use.

More specifically, the invention contemplates a box stitching machine wherein the stitching operation is controlled primarily by a single target switch and a stitch flap feeler finger or flap without the necessity for counting mechanism and the like.

The invention also provides a box stitching machine having a simplified control circuit with a minimum of electrical operating parts.

All of the objects of the present invention and the various features and details of the construction and operation thereof are more fully set forth hereinafter with reference to the accompanying drawings, in which:

Fig. 1 is a longitudinal section through a box stitching machine made in accordance with the present invention;

Fig. 2 is a view in section taken on the line 2—2 of Fig. 1;

Fig. 2*a* is a fragmentary sectional view taken on the line 2*a*—2*a* in Fig. 2;

Fig. 3 is an enlarged view in section taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary view similar to Fig. 3 showing the operation of the stitching head;

Fig. 5 is a view in section taken on the line 5—5 of Fig. 3;

Fig. 6 is an enlarged fragmentary view showing the construction of the feeler finger of the present invention and the positions thereof in full and broken lines in different modes of operation;

Fig. 7 is an enlarged fragmentary view in section showing the operation of the feeler finger switch;

Fig. 8 is a fragmentary view similar to Fig. 5 showing the feeler finger in an alternate mode of operation;

Fig. 9 is a view in section taken on the line 9—9 of Fig. 8;

Fig. 10 is a view similar to Fig. 7 showing the alternate mode of operation;

Fig. 11 is an enlarged view in section taken on the line 11—11 of Fig. 2;

Fig. 12 is a fragmentary view similar to Fig. 11 showing the mode of operation of the mechanism shown therein;

Fig. 13 is a view in side elevation of the mechanism shown in Figs. 11 and 12;

Fig. 14 is a view in perspective of the mechanism shown in Figs. 11–13;

Fig. 15 is a schematic wiring diagram of the control circuit of the box stitching machine;

Fig. 16 is a perspective view of a box blank tubulated in accordance with one mode of operation of the machine;

Fig. 17 is a view similar to Fig. 16 of a box blank tubulated in accordance with the alternate mode of operation of the machines; and

Fig. 18 is a perspective view of a tubulated box blank in assembled condition.

The stitching machine of the present invention comprises standard feed rolls for advancing a box blank through the stitching head of a stitching machine. In accordance with the invention, a feeler finger or flap detector is mounted in the stitching head to control the operation of the feed rolls and the stitcher. The machine is also controlled by a target member engaged by the leading edge of the box blank to initiate operation of the machine. In brief, the box blank is advanced into engagement with the target. At this time, the feeler finger or flap is in engagement with the stitch flap of the blank. Engagement of the leading edge of the blank against the target starts the stitching operation, raises the target out of the path of the blank, and connects the feed rolls for intermittent motion synchronized with the stitching machine. The stitching continues until the stitch flap of the blank passes beyond the feeler finger. When this occurs, the stitching operation ceases, the feed rolls are driven at a continuous rate, and the target is released. The feed rolls eject the blank from the stitching machine and the target falls into the path of the succeeding blank. When the succeeding blank engages against the target, the cycle of operation is repeated.

Referring now to the drawing, the stitching machine comprises a base 10 having a bed 11 thereon, for supporting the carton blank during its travel through the machine. Above the bed 11 the superstructure 12 of the machine supports the stitching mechanism 13. The machine is independently driven by a motor (not shown), or other suitable drive means. The drive means drives a pulley or fly wheel 17 by means of a belt 18 (see Fig. 2). In accordance with the standard practice, the pulley 17 is driven continuously while the machine is in operation. The pulley 17 is mounted for rotation relative to

a stitcher drive shaft 21. A clutch mechanism is provided at 22 to selectively engage the stitcher drive shaft 21 with the pulley or fly wheel at desired intervals. A sprocket 23 is also rotatably mounted on the shaft 21 and is connected to the fly wheel for rotation therewith. The sprocket 23 in turn drives a sprocket 24 through a chain shown in broken lines in 25 in Fig. 1. The sprocket 24 is keyed to a cross shaft 27. Thus, when the machine is in operation, the cross shaft 27 rotates continuously.

The carton blanks are advanced through the machine by upper and lower feed rolls 31, 31 and 32, 32 respectively. The upper feed rolls 31 are mounted on a shaft 33 journalled in the super-structure. The feed rolls 32, 32 are mounted on a shaft 34 supported in journals 35, 35 mounted on crank arms 36, 36 of a lower-roll rock shaft 37. The rock shaft 37 is movable between positions providing respectively loose and tight grips on the box blank between the rolls 31 and 32. In accordance with the usual practice, the shafts 33 and 34 are driven continuously at a relatively high speed during introduction and ejection of the box blank under the stitching head 13, and at intermittent speeds during the stitching operation. The upper and lower roll shafts 33 and 34 are driven in synchronism. To this end, the lower roll shaft 34 is connected to an extension shaft 38 by a universal connection indicated generally at 39, and the upper shaft 33 is geared to the extension shaft 38 by gearing indicated at 41.

Continuous operation of the upper and lower roll shafts 33 and 34 is obtained by connecting the shafts to the continuously operating cross shaft 27. To this end, the shaft 33 rotatably mounts a sprocket 42, which by a chain 43 is driven from a sprocket 44 on the shaft 27. A clutch 45 is selectively engaged to connect the sprocket 42 with the shaft 33 for continuous rotation.

To effect intermittent advance of the rolls 31 and 32, a clutch 46 connects the lower roll extension shaft 38 to an intermittent feed shaft 47 which is driven intermittently through a one-way clutch 141, an adjustable crank 142, and a bell crank 143 by a pitman 48 mounted on an eccentric 144 keyed to the stitcher drive shaft 21. This connection is conventional in the machine of the Harred patent, above-identified, for example as shown at 70—84 in Fig. 2 of the patent.

The clutches 45 and 46 are mechanically interconnected so that when the clutch 45 is engaged, the clutch 46 is disengaged and, vice versa, when the clutch 45 is disengaged, the clutch 46 is engaged. Operation of the clutches 45 and 46 is controlled by a feed-selector solenoid 49 (Fig. 15) which is energized upon engagement of the box blank with the target and the stitch flap with the feeler finger, as more fully described hereinafter.

The stitcher 13 is of conventional construction and is driven directly from the stitcher drive shaft 21. Operation of the drive shaft 21 is controlled by the clutch 22 to operate only when the stitch flap of the box blank underlies the stitcher in the stitching head. In addition to the control of the shaft 21 by the clutch 22, a brake 145 is mounted on the shaft 21 to prevent rotation of the shaft when the clutch 22 is disengaged. The brake is controlled by a brake solenoid 51 to be released when the stitcher is placed in operation and the feed rolls are driven intermittently. The clutch 22 is operated simultaneously with the brake by a main control solenoid 52, as described more fully hereinafter.

Referring to Figs. 16 and 17, the machine is arranged to stitch and tubulate carton blanks. The box blanks B comprise side and end panels SP, and EP, respectively. The side panels and end panels are connected by fold lines in the usual manner and the free edge of the end panel is provided with a stitch flap F which is adapted to overlap the free marginal portion of the remote side panel SP. As shown in Fig. 16, the stitch flap F may underlie the marginal edge of the side panel SP or as shown in Fig. 17, the stitch flap F may overlie the marginal portion of the panel SP. The side and end panels have end flaps in the usual manner to form the end closure of the tubulated blank B. Fig. 18 shows a carton assembled from the blank shown tubulated in Fig. 16.

The head of the stitcher 13 is provided with suitable guide means for the carton blank B. As shown in Figs. 3 to 5 inclusive, the stitcher head includes a U-shaped member 55. When stitching the blank as shown in Fig. 16, the upper leg 56 of the member 55 supports the side panel SP, the lower leg 57 supports the end panel EP, and the stitch flap F. The lower side and end panels travel below the leg 57 of the member 55. The upper leg 56 of the member 55 is foreshortened to afford engagement of the driving head 58 of the stitcher 13 against the upper surface of the marginal portion of the side panel SP to drive a stitch through the side panel and stitch flap to be clinched thereon by an anvil 59 mounted in the lower leg 57 of the member 55, as shown in Fig. 4.

In accordance with the invention, a feeler finger or flap 61 is mounted at the forward end of the leg 55 for engagement with the stitch flap F. As shown in Fig. 5, the feeler finger 61 is mounted on a shaft 62 journalled in the stitching head. The shaft 62 is formed with a cam surface at 63 for engaging the follower 64 of a stitch flap detector switch 65. At the far extremity of the shaft 62, a bias finger 66 is mounted and supports at its free end a bias spring 68 (see Fig. 6). The opposite end of the bias spring 68 is connected to the outer extremity 69 of a lever 71 pivoted to the stitcher head as indicated at 72. The spring 68 therefore biases the feeler finger 61 downwardly into engagement with the stitch flap F, when the lever 71 is in the position shown in Fig. 6. The cam surface 63 on the shaft 62, operates the follower 64 between upper and lower positions, corresponding respectively to the lower and upper positions of the feeler finger 61. In the upper position of the follower 64, the switch is open and in the lower position, the switch is closed.

When stitching the blank in the manner shown in Fig. 16, the stitch flap F is caused to travel on the upper surface of the leg 57 and the side panel SP on the upper surface of the leg 56. Thus, when the stitch flap is in proper position for stitching, the finger 61 is displaced upwardly to close the switch 65, and when the stitch flap F passes beyond the finger 61, the finger returns to its lower position to open the switch 65.

When stitching the blank in the manner shown in Fig. 17, the stitch flap F is caused to travel on the upper surface of the leg 56 and the side panel SP on the upper surface of the lower leg 57. In order for the feeler finger 61 to detect the presence of the stitch flap F on the upper leg 56, the lever 71 is reversed to the position shown in broken lines in Fig. 6, at 71*a*. This shifts the finger 61 to the position shown at 61*a* in Figs. 6, 8, 9, and 10, and biases the finger upwardly by means of the spring which is the position shown at 68*a*. When in this position, the cam surface 63 of the shaft 62 operates the follower 64 to open and close the detector switch 65. When the finger 61*a* is in its upper position, the follower 64 is in the upper position to open the switch 65, and when the finger 61*a* is in the lower position (shown in full lines in Fig. 10), the follower 64 is in its lower position to close the switch 65. Thus, to change the machine from stitching the blank shown in Fig. 16 to the blank shown in Fig. 17, it is only necessary to reverse the lever 71 from the position shown in full lines in Fig. 6 to the position shown in broken lines. Preferably, detents are provided on the switch casing to register with the stop pins at the free extremity 69 of the lever 71.

In addition to the stitch flap detector finger 61, a conventional target 75 also controls the operation of the stitching machine. As shown in Figs. 1 and 3, the target 75 is positioned in the path of movement of the blank B as it enters the machine. The target is mounted on

an arm 76 pivotally mounted as indicated at 77 in Fig. 1 on a longitudinally movable bottom plate 78 supported on the superstructure 12 as indicated at 79, 79 adjacent the stitcher 13.

In the present invention, at the remote end of the plate 78, a stud 81 projects upwardly through the superstructure 12 to engage a member 84 which displaces the operator 82 of a target switch 83. The member 84 mounts the pivot 77 and provides additional support for the plate 78 on the super structure 12. The plate 78 is normally retracted so that the switch operator 82 is normally in the position shown in Fig. 1 to open the target switch 83. When a box blank B is advanced into the machine by the rollers 31 and 32, the blank drives the target to the left as shown in Fig. 3 to displace the arm 76 and the plate 78 operating the operator 82 to the left to close the target switch 83. This initiates operation of the stitcher, as will be described more fully hereinafter.

Conventional means is provided to elevate the target 75 to allow further advance of the box blank to the machine. To this end, the target arm 76 is supported by a link 85 pivotally attached to a yoke 86. The yoke 86 is mounted on a target rock shaft 87 which is, in turn, rocked by a cam follower 88 controlled by a cam 89 on the stitcher drive shaft 21. When the shaft 87 is rocked clockwise as shown in Fig. 1, the link 85 pivots the target arms 76, 76 upwardly to the position shown in broken lines at 76*a* in Fig. 3, thereby elevating the target to the position shown in 75*a* within a depending housing 91 on the plate 78. The housing 91 serves to strip the blank B from the target 75 as the latter is elevated. The clockwise rocking of the shaft 87 also displaces the lower rollers 32 upwardly into clamping engagement with the blank by means of conventional mechanism not shown in the drawings. Such a mechanism is shown at 221—225 in Figs. 15–16 of the aforementioned Harred patent.

In the operation of the machine, when the blank has been advanced into position underlying the stitcher 13, the target 75 is actuated to close the target switch 83. At this point in the operation, the stitch flap feeler finger 61 is engaged with the stitch flap F to close the stitch flap switch 65. Closure of these switches, as described more fully hereinafter, energizes the solenoids 49, 51, and 52.

Energization of the solenoids 49 and 51 changes the operation of the feed rolls from continuous feeding to intermittent feeding and releases the brake on the stitcher drive shaft 21.

Energization of the solenoid 52 (see Figs. 11–14) displaces its core 93 downwardly. Downward displacement of the core 93 rocks a bell crank 94 away from its stop 95 to displace yoke fingers 96, 96 on the bell crank 94 to the right as shown in Fig. 13 and downwardly as shown in Fig. 2, to thereby engage the clutch 22 and effect connection between the pulley 17 and the stitcher drive shaft 21. Downward displacement of the core 93 also frees a foot 101 mounted on a sleeve 102 for downward displacement under the bias of a spring 103. To this end, the core 93 is provided with a roller 104 which underlies the foot 101 and normally maintains the same elevated. The sleeve 102 is freely rotatable on the shaft 27 to afford free rocking movement of the sleeve 102.

Counterclockwise rocking of the sleeve bracket 102 frees a latch arm 106 for counterclockwise rocking movement on the shaft 27 under the action of its bias spring 107. The latching lever 106 is provided with a cross piece 108 which is operable to engage over a depending foot 109 on an arm 110 keyed to the shaft 87 mounting the cam follower 88. Thus, when the solenoid 52 is energized to displace the core 93 downwardly the shaft 21 is rotated to rotate the target cam 89 and displace the cam follower 88 to rock the target rock shaft 87 clockwise.

When the shaft 21 has made a quarter revolution, the cam follower 88 is in its lower limit position and the latch lever 106, by means of the cross piece 108 and arm 110, latches the target rock shaft 87 in its clockwise limit position. As pointed out above, this elevates the target 75, and provides additional nip on the box blank by displacing the lower rolls 32, 32 upwardly against the bottom of the box blank.

When the target 75 is elevated, the arms 76, 76 are free to return to their normal longitudinal position, thereby displacing the plates 78 rearwardly to the position shown in full lines in Fig. 3. This releases the target switch to open the same, but as described more fully hereinafter, the stitch flap detector finger 61 by means of the switch 65 maintains the stitcher in operation with the various elements disposed in the positions just described.

When the stitch flap is advanced beyond the finger 61, the finger returns to its normal position, thereby opening the stitch flap switch 65. Means is provided to continue operation of the stitcher until the stitcher drive shaft has returned to its starting position so that the target cam 89 is in the position shown in full lines in Fig. 11. To this end, a cycle cam 111 is mounted on the shaft 21. In the drawings, the cam is circular and has a single projection 112 thereon operable to engage the operator 113 of a cycle switch 114. The switch 114 is normally closed but is operable to be opened when the operator 113 is displaced by the element 112 of the cam 111. An eccentric cam will operate satisfactorily in place of the cam 111. As described more fully hereinafter, the cycle switch 114 maintains the solenoids 49, 51, and 52 energized to continue operation of the stitch drive shaft 21 until the element 112 opens the cycle switch 114. By continuing rotation of the stitcher drive shaft in this manner, the driver of the stitcher is withdrawn at the completion of the stitching operation so that the last stitch inserted by the stitcher is completed prior to actuation of the feed rolls from intermittent operation to continuous operation.

The present invention provides a simplified wiring circuit for the box stitching machine. As pointed out above, the electrical elements of the circuit include the solenoids 49, 51, and 52, the stitch flap switch 65, the target switch 83, and the cycle switch 114.

Referring now to Fig. 15, the machine is operated from a source of voltage through a stop and start switch 120. Closure of the switch 120 impresses a voltage across the main drive motor M of the machine to start operation of the pulley 17 and thereby the feed rolls 31 and 32. The feed rolls 31 and 32 advance a carton blank B into the machine, the stitch flap F first operating the stitch flap switch 65. As shown in Fig. 15, closure of the stitch flap switch 65 does not disturb the condition of the circuit. Further advance of the feed rolls 31 and 32 drives the blank B into engagement with the target 75, displacing the target arms 76, 76 rearwardly to effect actuation of the target switch 83 to closed position.

Closure of the target switch 83 completes a circuit to a main control relay 121 from one side of the line 122 to the other side 123. Energization of the control relay 121 closes the relay contacts 124, 124 and 125, 125.

Closure of the contacts 124, 124 completes a holding circuit to the coil of the relay 121. This circuit is from the one side of the line 122 through the stitch flap switch 65 which has been closed by the stitch flap F, through the contacts 124, 124, to one side of the relay 121 which is directly connected on the other side to the other side of the line 123. Thus, the relay 121 is maintained energized upon opening of the target switch caused by the elevation of the target 75 into the housing 91 and its return to its initial longitudinal position.

Closure of the contacts 125, 125 completes a circuit to the solenoids 49, 51, and 52. The circuit to the solenoids is from the one side of the line 122 through the contacts 125, 125 to the lower side of the solenoids 49, 51, and 52 and from the solenoids to the other side of the line 123. Energization of the solenoids effects operation

of the machine as set forth above, and the machine continues to operate until the flap F passes beyond the finger 61. When this occurs, the stitch flap switch 65 is opened, but since the cycle switch 114 is in parallel to the switch 65, the circuit is maintained energized until the cycle is complete.

Completion of the cycle opens the switch 114, which in turn, de-energizes the relay 121 and opens the contacts 124, 124 and 125, 125. De-energization of the relay also closes the contacts 126, 126 which are connected to a counter for counting the box blanks discharged by the machine. The counter is a single surge counter, such that each time a voltage is impressed across the counter, it registers a single unit.

To summarize the operation of the machine, the drive motor M drives the fly wheel 17 mounted for rotation relative to the stitcher drive shaft 21. The fly wheel by chain and sprocket connections 23—25 continuously drives a cross shaft 27. The cross shaft through chain and sprocket 42—44 drives a continuous-feed clutch 45 which normally drives the upper and lower roll shafts 33 and 34 continuously in synchronism (by gears 41). Upper and lower feed rollers 31 and 32 on the upper and lower roll shafts respectively therefore advance the carton blank B at a continuous speed through the stitch guide plate 55 with the stitch-flap F overlying the marginal edge of the remote side panel SP.

Passage of the stitch-flap over or under the feeler finger 61 actuates the finger to close the circuit to the control relay holding contacts 124, 124. The leading edge of the blank when it engages the target 75 displaces the same forwardly to actuate the target switch 83 and energize the control relay 121. Energization of the relay completes a holding circuit bypassing the target switch through the holding contacts 124, 124 and the flap switch 65, and energizes three solenoids 49, 51, and 52 through a second set of contacts 125, 125. The solenoid 51 releases a brake on the stitcher drive shaft 21; the solenoid 52 engages a clutch between the fly wheel and the stitcher drive shaft to rotate the latter continuously and the solenoid 49 disengages the continuous feed clutch 45 and engages an intermittent feed clutch 46 on the upper and lower roll shafts to drive said shafts intermittently from the stitcher drive shaft by means of a pitman 48 and other mechanism not shown.

Rotation of the stitcher drive shaft through 90° causes the target cam 89 to pivot the target cam lever 88 downwardly against the bias of its spring and rock the target rock shaft 87 clockwise. The target rock shaft through a linkage 85, 86 raises the target 75 above the stripper housing 91 and affords passage of the blank B beyond the target by means of the feed rolls. The target rock shaft also displaces the lower rolls upwardly against the upper rolls to assure a firm engagement of the rolls with the blank during the intermittent feed. The solenoid 52, in addition to engaging the stitcher shaft clutch, releases the latch 106 for engagement with the target rock shaft 87 to retain the same in its clockwise limit position while the solenoid is energized. Thus, the blank B is advanced intermittently in timed relation to the stitching head 13 which is driven directly from the stitcher drive shaft 21. The intermittent feed of the rolls is regulated to control the spacing between stitches in conventional manner by means of the adjustable crank 142 herein, for example, as shown in the aforementioned Harred Patent at 83—84 in Fig. 2.

Stitching continues until the stitch-flap F passes beyond the feeler finger 61 which thereupon returns to its initial position, opening the switch 65. The circuit to the control relay, however, is maintained energized by the cycle switch 114 controlled by the cam 111 on the shaft 21. When the cycle switch is operated by the cam the circuit to the control relay is opened de-energizing the latter. De-energization of the relay de-energizes the solenoids 49, 50, and 52, thereby applying a brake to the stitcher drive shaft, disengaging the clutch to the stitcher drive shaft, disengaging the intermittent drive clutch and engaging the continuous drive clutch for the feed roll shafts. De-energization of the solenoid 52 also displaces the latch finger 108 out of engagement with the target rock shaft arm 110 and affords return of the rock shaft 87 to its counterclockwise limit position, thereby releasing the target and relaxing the grip on the blank by the lower feed rolls. The target rides on the top of the box blank B until the box blank is advanced beyond the target. When a succeeding blank is fed between the feed rolls, the cycle is repeated.

While a particular embodiment of the present invention has been herein illustrated and described, it is not intended to limit the invention to such a disclosure, but changes and modifications may be made therein and thereto within the scope of the following claims.

I claim:

1. In a machine for stitching box blanks having a stitch flap overlapping a side panel, a guide member guiding and supporting said stitch flap and side panel in their travel through said machine, said guide member having one leg for supporting said stitch flap and a second leg for supporting said side panel, a rigid detector finger, a shaft mounted in said guide member and mounting said finger for movement relative to said guide member for displacement between a first position in the path of movement of said stitch flap and a second position out of said path of movement, means to bias said finger towards said first position, whereby upon passage of said blank through said guide said stitch flap displaces said finger to its second position, and a stitch flap switch having an operator operatively connected to said detector finger and operable to be opened only upon displacement of the latter to its first position a distance corresponding to the thickness of said stitch flap, and closed only upon displacement of the finger from said first position toward its second position a distance corresponding to the thickness of said stitch flap.

2. Apparatus according to claim 1 wherein said detector finger is rigidly mounted on said shaft for pivotal movement therewith in said guide member, said shaft having a cam surface in registry with said stitch flap switch, and wherein further said stitch flap switch operator engages said cam surface to open and close the switch in response to displacement of said finger.

3. Apparatus according to claim 2 wherein said cam surface comprises a depression in said shaft and said operator comprises a roller biased against said shaft, said first position of said finger disposes said shaft depression out of registry with said roller, and said second position of said finger disposes said shaft in registry with said roller.

4. In a machine for stitching box blanks having a stitch flap portion overlapping a side panel portion, a guide member guiding and supporting said stitch flap and side panel portions of said blank in their travel through said machine, said guide member having an elongated upper leg, and an elongated lower leg disposed parallel to said upper leg, an elongated shaft disposed transversely and parallel to said legs intermediate said upper and lower legs, a detector finger rigidly mounted on said shaft for displacement between a first position in the path of movement of the blank portion travelling on said upper guide member, a second position out of said path of movement, a third position out of the path of movement of a blank portion on the lower guide member, and a fourth position in the path of movement of the blank portion travelling on the lower guide leg, bias means operatively connected to said shaft and mounted for movement between first and second positions, said bias means in its first position operable to bias said finger towards said first position of the finger and in its second position to bias said finger towards the fourth position of said finger, said shaft having a cam surface thereon, a stitch flap switch having an operator in registry with said cam surface and operable

to be opened upon displacement of said finger to its first and fourth positions and closed upon displacement upon said finger to its second and third positions, and means to displace said bias means to its first position when said stitch flap portion travels on said upper leg of the guide member and to its second position when said stitch flap portion travels upon said lower leg of the guide member.

5. Apparatus according to claim 4 wherein said cam surface comprises a depression in said shaft receiving said operator in the second and third positions of said finger and rejecting said operator in the first and fourth positions of said finger, and wherein further said switch flap switch includes means to bias said operator toward said depression.

References Cited in the file of this patent

UNITED STATES PATENTS

1,708,274	Lawrence	Apr. 9, 1929
2,264,776	Spiller	Dec. 2, 1941
2,277,218	Flowers	Mar. 24, 1942
2,317,208	Spiller	Apr. 20, 1943
2,317,298	Pabich	Apr. 20, 1943
2,785,403	Harred	Mar. 19, 1957