

Sept. 1, 1964

P. J. WESA ET AL
APPARATUS FOR FOLDING EDGES OF FLEXIBLE
COVERING MATERIAL ABOUT A
BOARD OR PANEL

3,147,172

Filed Aug. 10, 1960

5 Sheets-Sheet 1

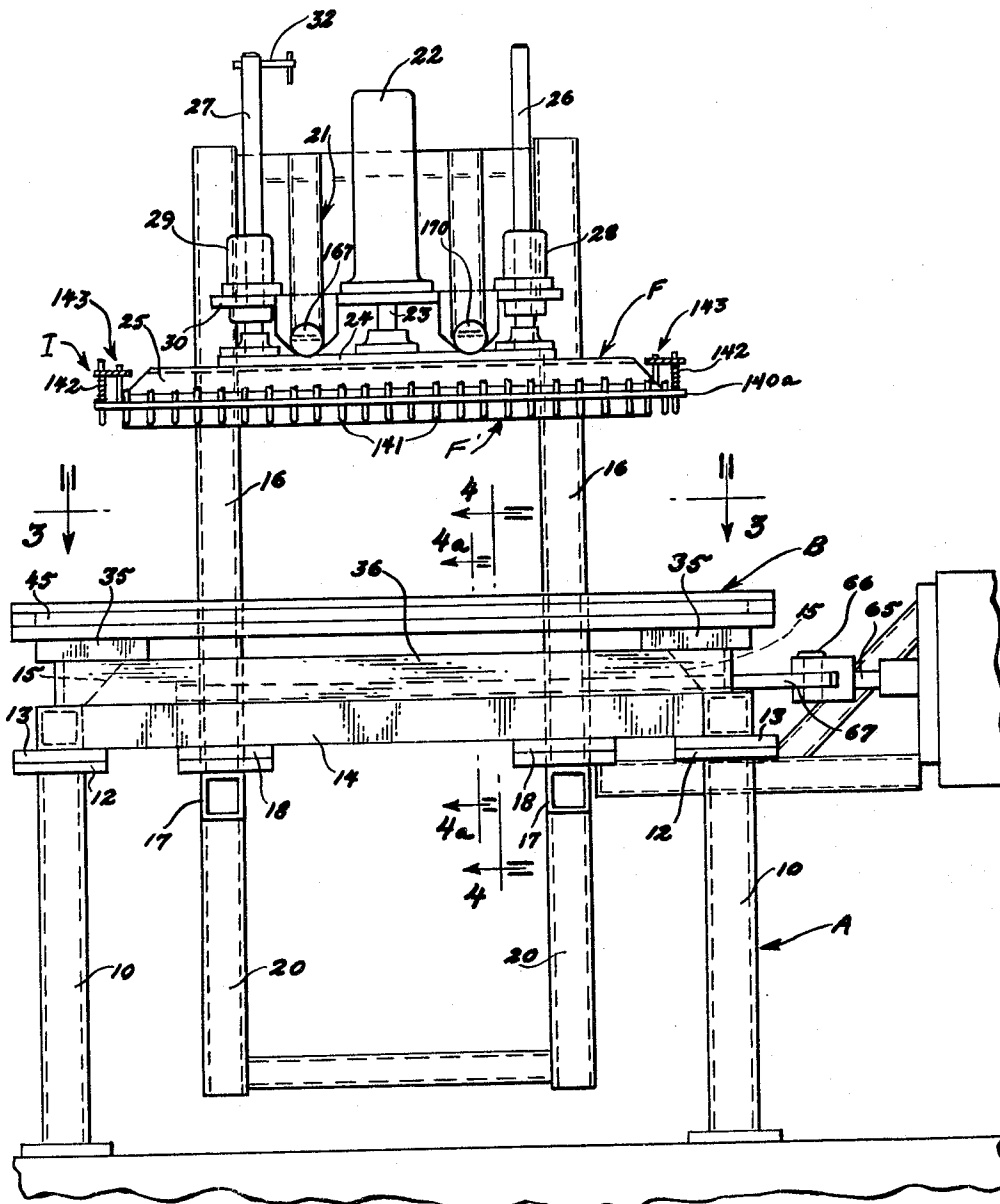


Fig. 1

INVENTORS.
PHILLIP J. WESA
WILLIAM H. BROCKMAN
ERWIN E. JOHNSON
FRED W. KICKBUSH

BY
Carl J. Barber
ATTORNEY

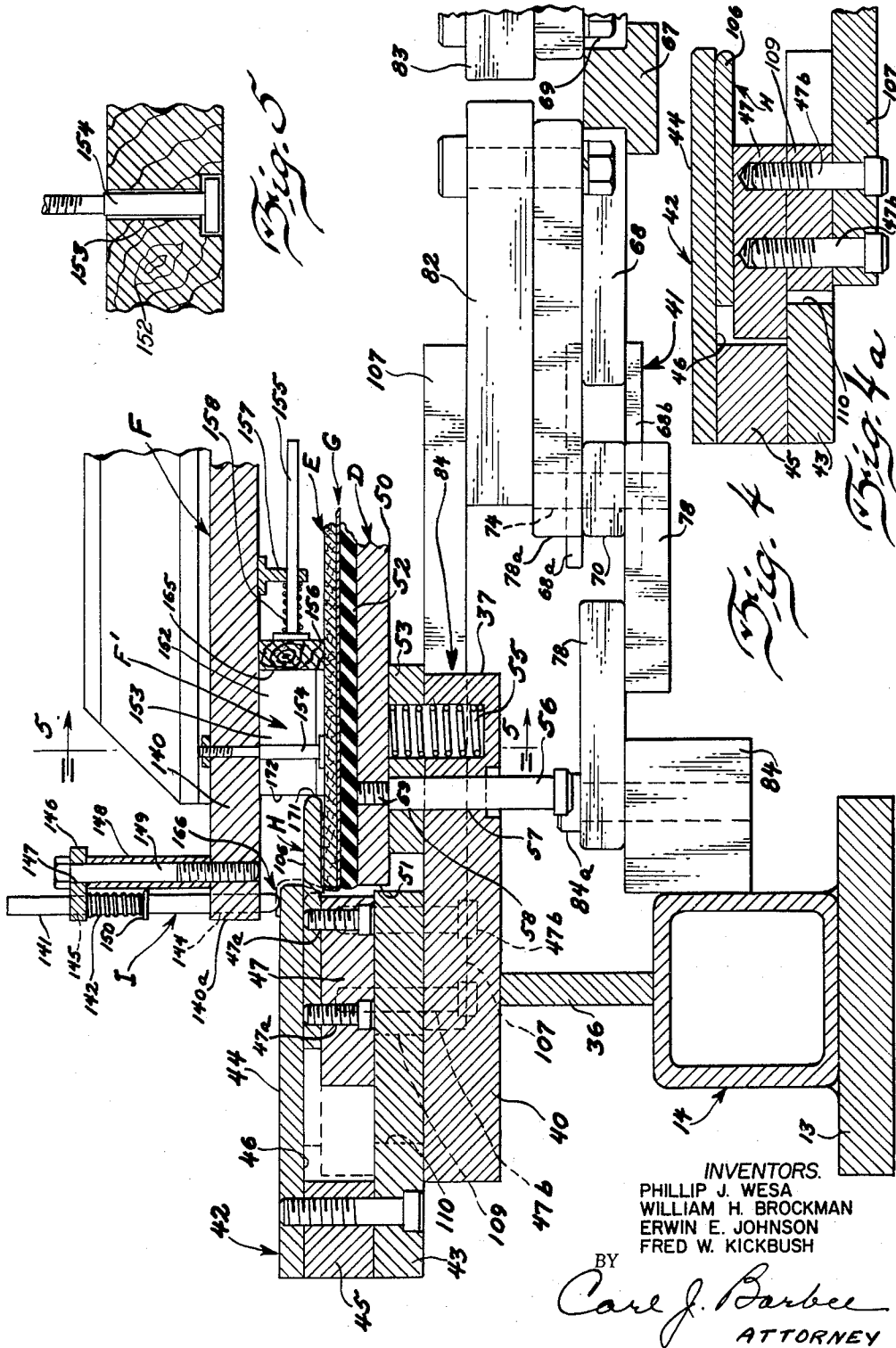
Sept. 1, 1964

P. J. WESA ET AL
APPARATUS FOR FOLDING EDGES OF FLEXIBLE
COVERING MATERIAL ABOUT A
BOARD OR PANEL

3,147,172

Filed Aug. 10, 1960

5 Sheets-Sheet 3



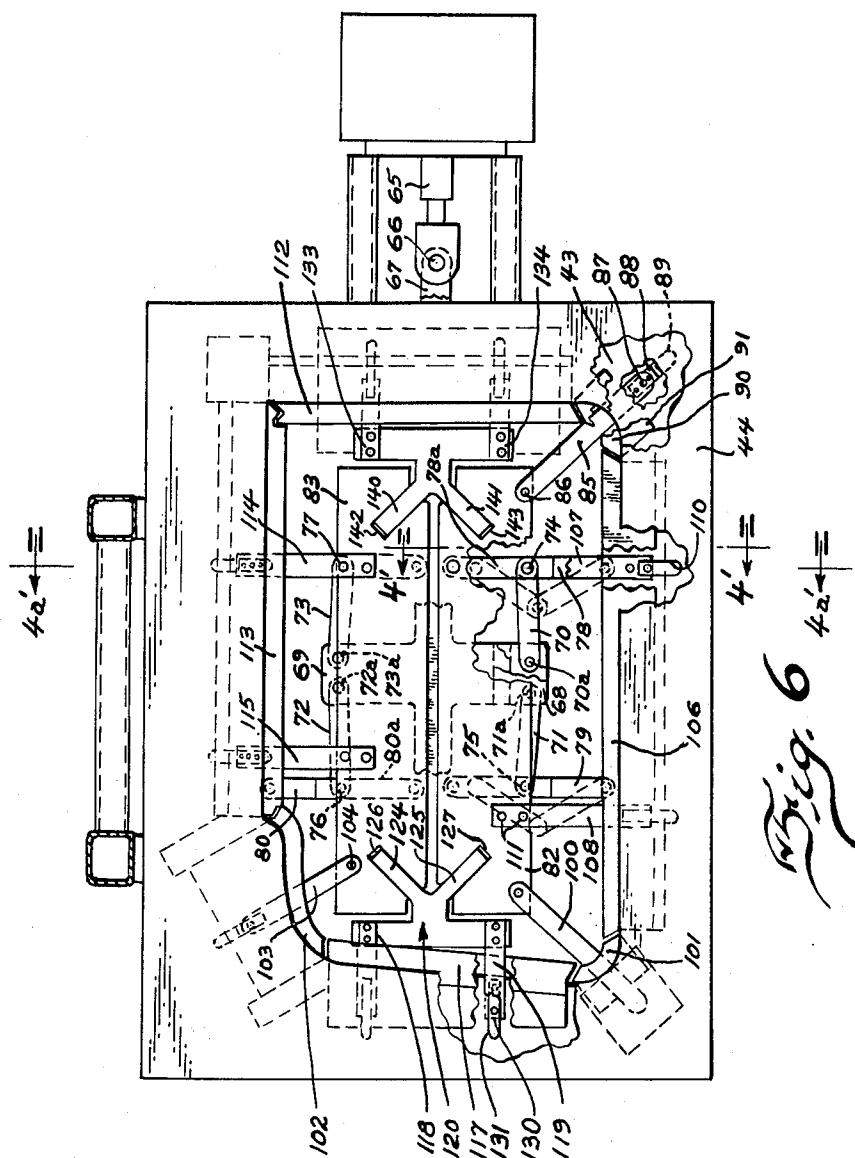
Sept. 1, 1964

P. J. WESA ET AL
APPARATUS FOR FOLDING EDGES OF FLEXIBLE
COVERING MATERIAL ABOUT A
BOARD OR PANEL

3,147,172

Filed Aug. 10, 1960

5 Sheets-Sheet 4



INVENTORS.
PHILLIP J. WESA
WILLIAM H. BROCKMAN
ERWIN E. JOHNSON
FRED W. KICKBUSH

BY
Carl J. Barber
ATTORNEY

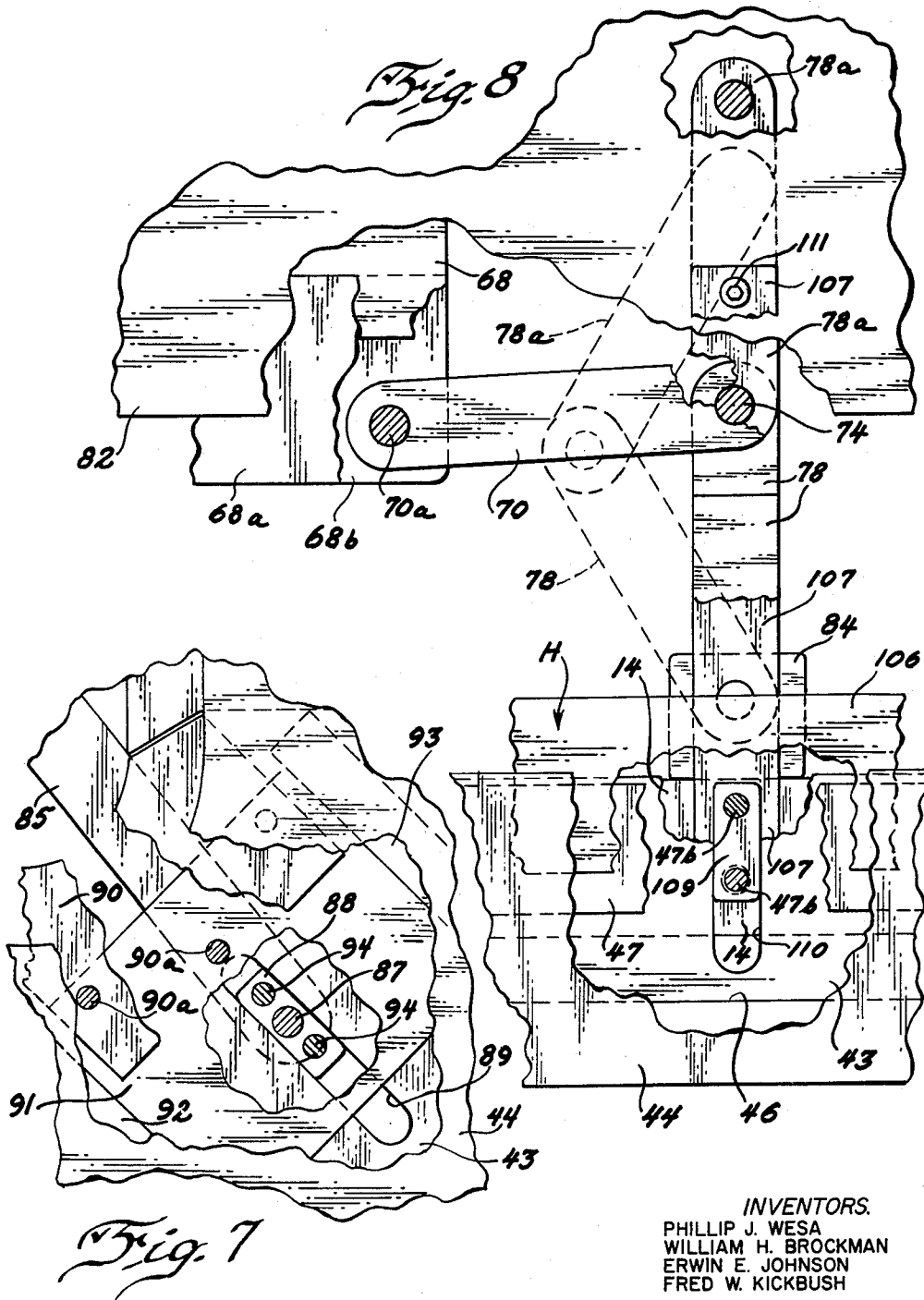
Sept. 1, 1964

P. J. WESA ET AL
APPARATUS FOR FOLDING EDGES OF FLEXIBLE
COVERING MATERIAL ABOUT A
BOARD OR PANEL

3,147,172

Filed Aug. 10, 1960

5 Sheets-Sheet 5



INVENTORS.
PHILLIP J. WESA
WILLIAM H. BROCKMAN
ERWIN E. JOHNSON
FRED W. KICKBUSH

BY
Carl J. Barber
ATTORNEY

1

3,147,172

APPARATUS FOR FOLDING EDGES OF FLEXIBLE COVERING MATERIAL ABOUT A BOARD OR PANEL

Phillip J. Wesa, William H. Brockman, and Erwin E. Johnson, Milwaukee, and Fred W. Kickbush, Brookfield, Wis., assignors to American Motors Corporation, Kenosha, Wis., a corporation of Maryland
Filed Aug. 10, 1960, Ser. No. 48,623
8 Claims. (Cl. 156-475)

The invention relates to a machine which may be generally referred to as a folding machine.

The principal object is to provide a machine which is capable of folding the marginal edge of a flexible covering material over the perimeter of a board or panel which is to be covered by the covering material.

A specific object is to provide in a folding machine means for holding the marginal edge of the covering material taut preparatory to and during the folding operation.

A further object is to provide in a folding machine a pressure foot assembly which carries the means for holding the covering material taut during the folding operation.

A further object is to provide in a folding machine novel apparatus for actuating the pusher shoes which perform the folding operation.

Other objects and advantages will be apparent from the following specification and appended drawings in which:

FIG. 1 is a front elevation of the folding machine with the power unit shown fragmentarily.

FIG. 2 is side elevation of the machine shown in FIG. 1.

FIG. 3 is a plan view of the machine taken generally on the line 3-3 of FIG. 2 and showing the power unit fragmentarily and showing the machine in condition prior to execution of the folding operation. In FIG. 3 the work receiving pad is removed.

FIG. 4 is a fragmentary sectional view of a portion of the machine taken generally on the line 4-4 of FIG. 1 and shown more accurately as to the exact location of the parting line by the line 4'-4' of FIG. 6.

FIG. 4a is a fragmentary sectional view showing part of the mechanism shown in FIG. 4 but taken on the line 4a-4a of FIG. 1 and shown more accurately as to the exact location of the parting line by the line 4a'-4a' of FIG. 6.

FIG. 5 is a fragmentary sectional detail view of a portion of the pressure foot taken on the line 5-5 of FIG. 4.

FIG. 6 is a plan view similar to FIG. 3 showing various details broken in section and showing the pusher shoes in closed position, after execution of the folding operation. In FIG. 6 the work receiving pad is removed.

FIG. 7 is a fragmentary detail view on an enlarged scale of a portion of the operating mechanism shown in FIGS. 3 and 6.

FIG. 8 is a fragmentary detail view on an enlarged scale of a portion of the operating mechanism shown in FIGS. 3, 4, and 6.

In general the machine includes a frame structure A having a bed portion B providing a work receiving area indicated by the letter C in FIGS. 3 and 6. A work receiving pad and base assembly identified generally by the letter D is carried by the frame for up and down movement relative thereto. The work or board E is mounted on the pad and base assembly preparatory to the folding operation and the pressure foot assembly F is carried by the upper portion of the frame. The board engaging pressure shoe portion F' is lowered into contact with the board during the folding operation. The flexible cover-

2

ing material G is folded over the perimeter of the board E by means of the pusher shoes H. The mechanism I which is carried by the pressure foot assembly is comprised of a series of spring pressed fingers which serves to hold the marginal edge of the covering material taut during the initial steps of the folding operation.

Referring primarily to FIGS. 1 and 2 the machine frame may include front corner posts 10 and rear corner posts 11 having plates 12 anchored to their upper ends to carry the foot portions 13 of the bed carrying frame 14. This latter frame may be generally of rectangular outline and carries the corner brackets 15 which in turn carry the bed B.

The general frame work of the machine also includes an upright column which may consist of spaced pillars 16 anchored to the principal frame structure A as by means of the cross rails 17 which in turn are anchored to the foot portions 18. The uprights 16 may also be anchored to the frame member 14 as at 19. Brace members 20 serve to reinforce the upright frame structure. At the upper end of the uprights 16 a beam structure identified generally by the numeral 21 overhangs the bed B and carries the pressure foot assembly F for up and down movement toward and away from the bed B.

The actuation of the pressure foot may be accomplished as by means of an air cylinder 22 in which the piston rod 23 is anchored to the backing plate 24 to which the frame portion 25 of the pressure foot is anchored. The pressure foot assembly is provided with guide rods 26 and 27 which are reciprocally received by the bearing housings 28 and 29 respectively. The bearing housings in turn are anchored to the support plate 30 which carries the air cylinder housing 22 and which is rigidly secured to the rails 31 as a part of the beam structure 21. The extent of downward travel of the pressure foot assembly may be determined by means of an adjustable stop 32.

The bed structure B includes corner plates 35 which support the bed with reference to the front and rear rails 36 and 37. The rails are rigidly anchored to the tubular frame member 14. Anchored to the upper faces of the corner plates 35 is the bed structure B. The bed structure B may consist of lower plate members 43 which circumscribe the boundary defined by the board E and the upper plates 44 which likewise circumscribe the board E and collectively form platform 42. The upper and lower plate members are spaced from each other by means of suitable plates 45 to provide appropriate channel areas 46 within which the slide blocks 47 (to which the pusher shoes H are secured) are received for in and out sliding movement during the folding operation.

The pad D upon which the board E is mounted during the folding operation may include a rigid base member 50, the perimeter 51, of which, describes the same outline as the board. A resilient pad 52 is mounted on top of the base member 50 and its perimeter likewise describes the outline of the board. Anchored to the rails 36 and 37 and to the plate members 43 are intermittently placed support blocks 40 which serve to carry the base 50. The base is spaced from the upper surface of the support blocks as by means of suitable spacers 53 and the base member 50 is movable up and down with reference to the support blocks under the influence of compression springs 55, one of which may be utilized at each support block (only one of such springs being shown in FIG. 4). Guide bolts 56 are slidably received in the bores 57 and 58 of each support block and spacer and are threaded at 59 into the base member 50. Thus, viewing FIG. 4, it will be noted that the base member is pushed downwardly under the influence of pressure foot F' to its maximum depth wherein the underside of the

base member is resting on the upper faces of the spacers 53. At this depth the board E is at the proper level for effecting of the folding operation by the pusher shoes H.

Referring to FIGS. 3, 4 and 6 there is shown the apparatus which actuates the pusher shoes for performing the folding operation. The piston rod 65 of the air cylinder is pivotally connected at 66 to an elongated actuating bar 67 which extends generally throughout the length of the table at a level substantially common with the level of the various actuating arms to be described hereinafter. The actuating bar 67 is provided with lateral extensions 68 and 69 and the primary actuating links 70, 71, 72 and 73 are each pivotally connected at 70a, 71a, 72a and 73a to the bar extensions. The extensions are bifurcated at their outer ends as shown in FIG. 4 providing spaced legs 68a and 68b for receiving the links 70, 71, 72 and 73 therebetween. The opposite ends of said links are pivotally connected at 74, 75, 76 and 77 to the toggle arms 78-78a, 79-79a, 80-80a and 81-81a which cause the plates 82 and 83 to move toward and away from each other during the folding operation. The links 78, 79, 80 and 81 are pivotally connected, as by means of bolts 84a (see FIG. 4), at their outer ends to suitable bosses 84 which are anchored to frame member 14. Referring to the linkage assembly shown in detail in FIG. 7 the link 85 is pivotally connected at 86 (see FIGS. 3 and 6) to plate 82 and at its opposite end is pivotally connected at 87 to guide block 88 which is reciprocally received in a channel 89 in the plate member 43. The pusher shoe 90 is anchored by bolts 90a to a guide plate 91 which in turn is guided for reciprocation relative to the frame by means of side rails 92 and 93. The guide plate 91 is anchored to the guide block 88 by means of bolts 94. It will be noted that the link 85 is situated beneath the plate member 43 and the guide plate 91 is situated above said plate member. The plate member 43 is of sufficient thickness to accommodate the thickness of the guide block 88 while providing the necessary channel 89 within which the guide block reciprocates. The upper plate member 44 is, of course, spaced from the lower plate member 43 to provide the necessary pocket or chamber within which the pusher shoe 90 and guide plate 91 are accommodated.

Referring to FIGS. 3 and 6 link 100 is pivotally connected at 100a one end to plate 82 and at its other end to a guide block (not shown) similar to guide block 88. The pusher shoe 101 is associated with the link 100 and mounted relative to the frame in a manner similar to that hereinbefore explained in connection with pusher shoe 90 and no further explanation is believed to be necessary.

Pusher shoe 102 is likewise mounted relative to the frame and relative to link 103 in a manner similar to that previously explained in connection with pusher shoe 90. The link 103 is pivotally connected at 104 to plate 83.

Pusher shoe 106 is anchored to guide plate 47 by bolts 47a and a pair of struts 107 and 108 are anchored to plate 47 by bolts 47b thereto and each such strut has a guide block 109 anchored thereto on the upper side thereof—such guide blocks being reciprocally received in appropriate frame slots 110. The inner ends of said struts are anchored by means of bolts 111 to the plate 82. Thus the basic movement of the pusher shoe 106 is rectilinearly crosswise of the frame, reflecting the movements of the plates 82 and 83. Pusher shoe 113 is likewise provided with a pair of struts 114 and 115 and the operation of the pusher shoe 113 is similar to that of pusher shoe 106 and no further explanation is necessary.

Pusher shoes 112 and 117 are of similar construction except for the lengths thereof and the mode of operation and direction of movement of each are identical and a description of one is adequate. Referring to pusher shoe 117, this shoe is anchored to a pair of struts 118 and 119 which at one end are anchored to an actuator identified generally by the numeral 120. The actuator has a cen-

tral portion 121 with lateral extensions 122 and 123 to which the struts are secured. The angularly inclined actuator legs 124 and 125 are received respectively in slots 126 and 127 in plates 82 and 83. When the plates 82 and 83 are actuated toward each other the slots 126 and 127 act on the legs 124 and 125 to cause inward movement of the pusher shoe 117 (to the fully closed position as shown in FIG. 6). The outer ends of the struts 118 and 119 are anchored to suitable guide blocks 130 which are reciprocally received in suitable frame slots 131 in a manner similar to the description of guide block 88. The pusher shoe 112 is likewise provided with struts 133 and 134 and actuator member 135 of the same type as actuator member 120. The operation of pusher shoe 112 is similar to that of pusher shoe 117 and needs no further explanation.

In the operation of opening and closing the various pusher shoes during the folding operation, the air cylinder actuates the piston rod 65 to move the actuator bar 67 for simultaneously instituting the appropriate movements to all of the pusher shoes. Thus, viewing FIG. 6, the actuator bar 67 would be moved to the right for instituting the closing action to the various pusher shoes. FIG. 6 shows all of the pusher shoes in fully closed position wherein the marginal area of the cover material G has been completely folded over the perimeter of the board E in the manner as shown best in FIG. 4. The action which takes place during the closing of the pusher shoes is as follows: During the rightwise movement of actuator bar 67 the extensions 68 and 69 cause the links 70, 71, 72 and 73 to act upon the pivots 74, 75, 76 and 77 for closing the toggle arms associated with such pivots. Closed position of such toggle arms is considered to be that in which said arms are extended so as to lie along a common longitudinal center line, as shown, for example, in solid lines in FIG. 8. Open position of the toggle arms is considered to be that in which said arms buckle in the manner as indicated in dotted lines in FIG. 8. With the toggle arms in this position, the plates 82 and 83 are each withdrawn away from each other as indicated best in FIG. 3. This position is referred to as the fully opened position of the pusher shoes.

Referring to FIGS. 3 and 6 it will be noted that the work receiving pad and base 50 are shown removed in order to expose the operating mechanism which is situated directly beneath such base and pad.

Referring now to FIGS. 1, 2 and 4 it will be noted that the pressure foot assembly F is provided with a rigid frame 140 which circumscribes the pressure foot assembly. The frame may generally describe an outline which is similar to the outline of the board E but of larger surface area. The margin area 140a accommodates a series of spring pressed fingers identified generally by the letter I, such fingers being rather closely spaced to each other, as best indicated in FIG. 1. It will be noted that the complete details of each finger assembly are omitted from FIGS. 1 and 2 in order to avoid obscurity in the drawings. It will be understood, however, that each of the numerous fingers 141 are provided with the necessary spring 142 and support assembly indicated generally by the numeral 143. The details of each spring pressed finger assembly are best shown in FIG. 4 wherein it will be noted that the finger 141 projects through a suitable bore 144 in the frame 140 and a suitable bore 145 in the rail 146. The rail is of a continuous nature, the same as the perimeter of the frame 140, in that it completely circumscribes the pressure foot assembly and describes an outline similar to that described by the perimeter of the frame 140. The rail 146 is provided with a series of holes 147 for each finger assembly and a spacer sleeve 148 in conjunction with bolt 149 serves to properly space the rail from the frame 140. Each finger has a washer 150 fixed thereto against which the spring 142 abuts.

The frame 140 serves to carry the pressure foot mecha-

5

nism on the underneath side thereof. The pressure foot mechanism includes the foot members 152 which may be formed of wood or some similar material. The foot members are of individual construction but collectively are arranged so as to define an outline generally similar to the outline of the board E and each foot member is movably supported with reference to the frame 140. Each foot member is provided with a series of T-shaped slots 153 through which the guide bolts 154 extend. A series of guide rods 155 are secured to the inner faces of the foot members and project through suitable openings in the hanger members 157 which are anchored to the underside of the frame 140. Suitable compression springs 158 serve to continuously urge the foot members outwardly with reference to the frame 140. At the corner areas of the foot members, when considered collectively as a complete pressure foot assembly, there will be adequate spacing as indicated at 160 (see FIGURE 2) to permit the contraction of the pressure foot assembly when the individual foot members are each pushed inwardly under the influence of the various pusher shoes H.

Operation

In the operation of the folding machine all of the pusher shoes H are initially in retracted or opened position to permit the flexible covering material G and the board E to be inserted onto the pad 52 preparatory to the folding operation. With the pusher shoes H fully retracted, the pressure foot members 152 will be likewise forced outwardly under the influence of springs 158 to their fully extended positions, wherein the bolts 154 would be in contact with the end walls 165.

The pressure foot assembly F will, of course, be in the raised position as shown best in FIG. 1. The marginal area of the covering material G will be overlapping the marginal area of the platform 42, as best shown in dotted lines at 166 in FIG. 4. It will be understood that with the pressure foot assembly in raised position, as shown in FIG. 1, the base or pad D will be in raised position, due to springs 55, wherein the upper face of the board will be about flush with the upper face of platform 42.

Then the pressure foot assembly F moves downwardly under the influence of air pressure until the foot portions 152 engage the upper surface of the board E. A control button 167 may be utilized to actuate the air cylinder 22 for causing the lowering of the pressure foot assembly, the mechanism for showing the interconnection of the control button with the air cylinder not being shown. When the pressure foot members engage the board E, such board along with the supporting base 50 will be lowered against the tension of springs 55 to the level as indicated in FIG. 4 wherein the underside of the base 50 engages the upper face of the spacers 53. At this level, the board E is in proper position with reference to the pusher shoes H. When the pressure foot assembly is lowered to the position in which the upper face of the board E is flush with the upper face of platform 42, each of the numerous fingers 141 will have been brought into engagement with the marginal area of the covering material 166 and will hold same against the upper surface of the platform 42. The extent of the holding action is determined by the strength of the springs 142, such holding action being overcome during the folding operation (that is the continued downward movement of the pressure foot assembly to the position shown in FIG. 4 and the subsequent movement of the pusher shoes H inwardly, as shown in FIG. 4). The amount of the holding action asserted by the fingers will be such as to hold the covering material taut until such time as the material is pulled free of such fingers by the action of the pusher shoes.

The pusher shoes H are actuated collectively and simultaneously by the movement of the actuator bar 67 under the influence of air pressure. A control button 170 may have proper association with the air cylinder which actu-

6

ates the bar 67, the details of which are not shown herein. Upon actuation of the bar 67 all of the pusher shoes H move inwardly simultaneously with their inner edges 171 engaging the end walls 172 of the pressure foot members causing such foot members to move collectively inwardly simultaneously while sliding along the upper surface of the board E. The pressure foot members thus maintain the board E at the proper level during the folding operation. As the pusher shoes H move inwardly the inner edges 171 engage the covering material G and commence folding the marginal edges thereof over the perimeter of the board E. The holding action of the fingers is overcome during the inward movement of the pusher shoes permitting the marginal area of the covering material to be fully folded over and pressed into contact with the upper face of the board E, as shown in full lines in FIG. 4. The underside of the covering material, at the marginal area thereof, is provided with a suitable adhesive for holding the covering material in place on the board after the folding operation is consummated. The pressure foot assembly is then released and raised to the position shown in FIG. 1, after which the actuator bar 67 is operated for effecting retracting of the pusher shoes to permit the finished or end product to be removed preparatory to the next use of the machine.

We claim:

1. A machine for folding the margin area of a flexible covering material over the edge and over the upper surface adjacent to the edge of a board, said machine comprising: a frame; a bed structure carried by the frame; a base for receiving the board to be covered, said base being movable up and down with reference to the bed structure; resilient means between the frame and base for urging the base upwardly; a pressure foot assembly positioned above the base and movable up and down for engaging the board and lowering the board and the base with reference to the bed structure; said bed structure having an upper face serving as a platform with an opening therein defining a margin area which circumscribes the surface area defined by the board; resilient holding means carried on the pressure foot assembly and overlying the margin area of the upper face of the bed structure and engaging the margin area of the covering material and holding same temporarily against the upper face of the bed structure, while the pressure foot assembly moves downwardly below the level of the upper face of the bed structure to fold the margin area of the covering material over the edge of the board; pusher shoes associated with the bed structure for in and out movement relative thereto in a substantially horizontal plane beneath the level of the upper face of the bed structure and engaging the margin area of the covering material and folding some inwardly against the upper surface of the board adjacent its edge, said holding means continuing to hold the margin area of the covering material temporarily against the upper face of the bed structure while a portion of the margin area of the covering material is folded against the upper surface of the board by the pusher shoes.

2. A machine for folding the margin area of a flexible covering material over the edge and over the upper surface adjacent to the edge of a flat board, said machine comprising: a frame; a bed structure carried by the frame; a base for receiving the board to be covered, said base being movable up and down the reference to the bed structure; resilient means between the frame and base for urging the base upwardly; a pressure foot assembly including a frame portion and a foot portion carried on the frame portion, the pressure foot assembly being positioned above the base and being movable up and down relative to the frame, whereby to cause the foot portion of the pressure foot assembly to engage the board and lower the board and base with reference to the bed structure; said bed structure having an upper face serving as a platform with an opening therein defining a margin area which circumscribes the surface area de-

fined by the board; retractible holding means mounted on the frame portion of the pressure foot assembly and overlying the margin area of the upper face of the bed structure and engaging the margin area of the covering material and holding same temporarily against the upper face of the bed structure, while the pressure foot assembly moves downwardly below the level of the upper face of the bed structure to fold the margin area of the covering material over the edge of the board; pusher shoes reciprocally mounted on the bed structure for in and out movement relative thereto in a substantially horizontal plane beneath the level of the upper face of the bed structure and engaging the margin area of the covering material and folding same inwardly against the upper surface of the board adjacent its edge, said holding means continuing to hold the margin area of the covering material temporarily against the upper face of the bed structure while a portion of the margin area of the covering material is folded against the upper surface of the board.

3. A machine for folding the margin area of a flexible covering material over the edge and adjacent margin area of a flat board, said machine comprising: a frame; a bed structure carried by the frame and including an upper face serving as a platform portion, said platform portion having an opening therein; a base carried by the frame for up and down movement relative thereto in general alignment with the platform portion opening, said base being adapted to carry the board; resilient means between the frame and base for normally urging the base upwardly; a pressure foot assembly including a frame portion and a foot portion carried by the frame portion and overlying the platform portion opening and the base, said pressure foot assembly being adapted for up and down movement toward and away from the base and said foot portion being carried by the frame portion for in and out movement in a plane generally horizontal and transverse to the direction of up and down movement of the pressure foot assembly; pusher shoes carried by the bed structure beneath the platform portion and movable in and out with reference to the bed structure in a plane which is generally horizontal and transverse to the direction of movement of the base and the direction of movement of the pressure foot assembly, the foot portion of the pressure foot assembly engaging the board and lowering the board and the base to a level to permit the pusher shoes to move inwardly above the board and to engage the margin area of the covering material and fold same over the edge and margin area of the board; means for activating the pusher shoes to cause the inward movement thereof, said pusher shoes engaging the foot portion of the pressure foot assembly to cause the inward movement of the foot portion relative to the frame portion of the pressure foot assembly.

4. A machine as set forth in claim 3 wherein power actuated means are carried by the frame for actuating the up and down movement of the pressure foot assembly.

5. A machine as set forth in claim 3 wherein resiliently mounted holding means are carried on the frame portion of the pressure foot assembly and the holding means engage the margin area of the covering material and hold same against the upper face of the platform and the pusher shoes move inwardly and engage the covering material.

6. As a sub-combination for a folding machine having a frame and a bed structure with a platform carried by the frame: pusher shoes carried by the bed structure beneath the platform and being movable in and out relative to the platform, said shoes being arranged independently of each other but collectively defining a generally

continuous closed boundary; means for simultaneously actuating the shoes to cause same to move collectively inwardly whereby to collectively define a boundary of shorter linear dimension, said means including an actuating bar carried relative to the frame for rectilinear movement in a generally horizontal plane; spaced plates carried relative to the frame for rectilinear movement in a substantially horizontal plane and transverse to the movement of the actuator bar; toggle arms interconnecting the plates and the actuator bar for effecting inward movement of the plates toward each other simultaneously with the movement of the actuator bar in one direction; struts anchored to each plate and slidably carried by the bed structure for effecting rectilinear direction of movement of the plates; some of the pusher shoes being connected to the struts so as to move simultaneously with the plates; actuator members slidably carried by the bed structure for in and out rectilinear movement in a generally horizontal plane and in a direction common to the direction of movement of the actuator bar; some of the pusher shoes being connected relative to the actuator members to move in and out along with the actuator members; said plates having slots therein, and said actuator members including angularly inclined actuator legs received in the plate slots for effecting the in and out movement of the actuator members whenever the plates are moved in and out relative to each other.

7. A sub-combination as set forth in claim 6 wherein some of the pusher shoes are slidably carried by the bed structure for inward movement in a direction generally angularly with reference to the direction of movement of the plates and links having pivotal connection with the plates and some of the pusher shoes for permitting angular movement of some of the shoes as a result of the transverse movement of the plates.

8. As a sub-combination for a machine for folding the margin area of a flexible covering material over the edge of a board in which said machine includes a frame and a bed structure with a platform having an upper face and being carried by the frame and in which the platform has an opening therein to accommodate the board, means for temporarily holding the margin area of the covering material against the upper face of the platform preparatory to the effecting of the folding of the margin area of the material over the edge of the end product, said means comprising: a pressure foot assembly positioned above the opening in the platform and being movable up and down for engaging the board and lowering the board with reference to the bed structure; said pressure foot assembly including a frame portion generally defining an outline similar to the outline of the platform opening; the perimeter of the frame portion overlying the margin area of the upper face of the platform surrounding the platform opening; resilient means mounted on the frame portion so as to overlie the aforesaid margin area of the platform, said resilient means holding the margin area of the covering material against the upper face of the platform.

References Cited in the file of this patent

UNITED STATES PATENTS

1,326,827	Anthony	Dec. 30, 1919
1,365,648	Anthony	Jan. 18, 1921
2,569,534	Netz	Oct. 2, 1951
2,620,854	Wetherell	Dec. 9, 1952
2,621,142	Wetherell	Dec. 9, 1952
2,740,458	Wold	Apr. 3, 1956
2,756,805	Silverman	July 31, 1956
2,808,099	Silverman	Oct. 1, 1957

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,147,172

September 1, 1964

Phillip J. Wesa et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 4, for "serves" read -- serve --; column 4, line 21, for "hte" read -- the --; line 40, for "anl" read -- and --; column 6, line 52, for "some" read -- same --; column 8, line 1, for "boundray" read -- boundary --.

Signed and sealed this 29th day of December 1964.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents