

Sept. 25, 1962

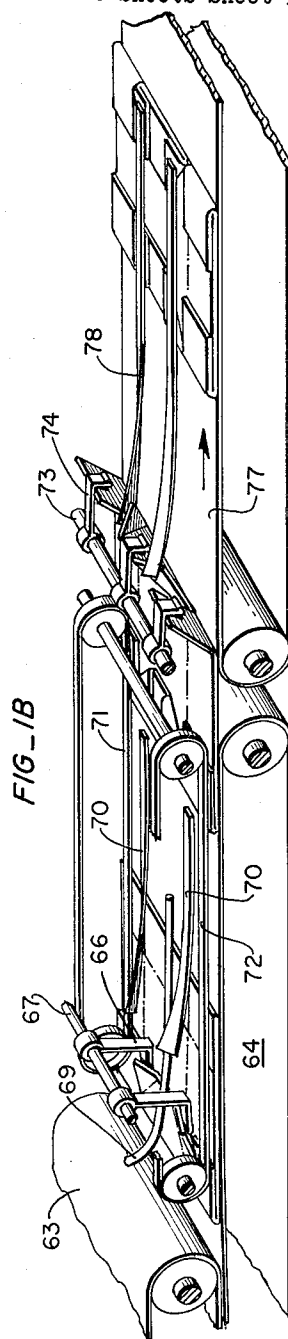
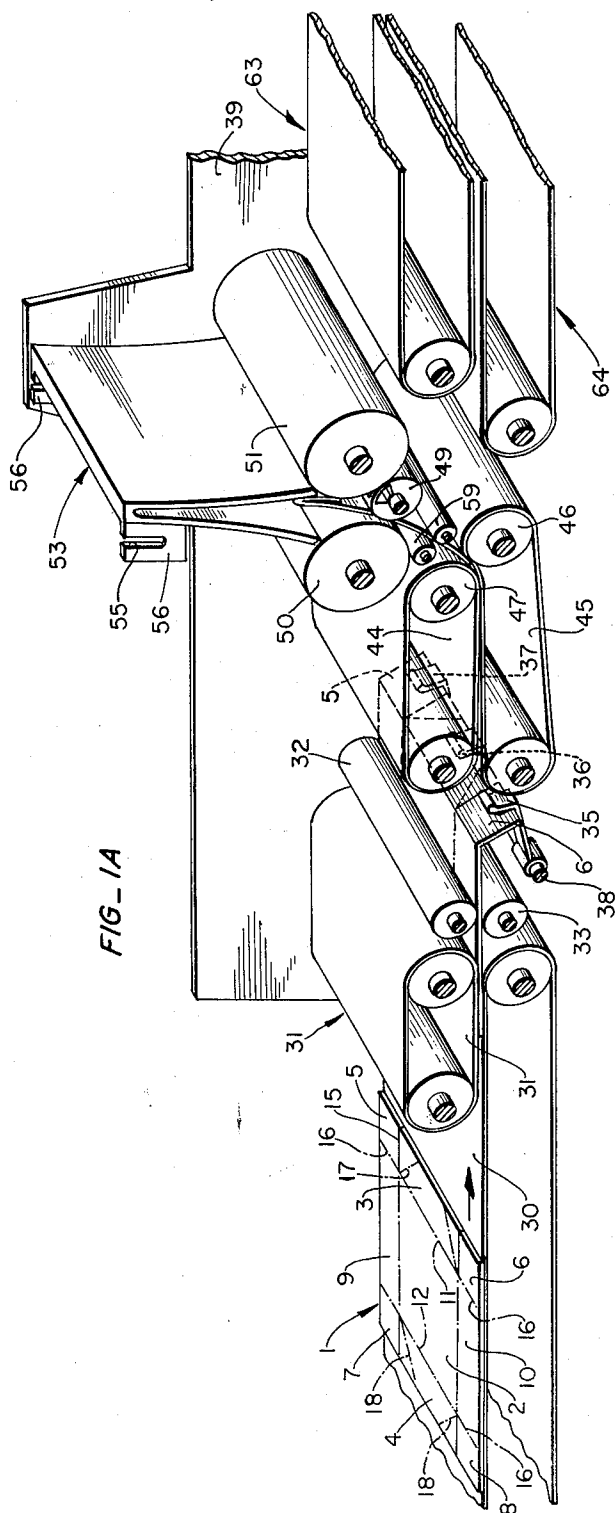
T. L. MILLICH

3,055,276

SHEET FOLDING APPARATUS AND METHOD

Filed Nov. 21, 1960

5 Sheets-Sheet 1



INVENTOR.
THOMAS L. MILLICH
BY
Bayker, Mahler + Wood
ATTORNEYS

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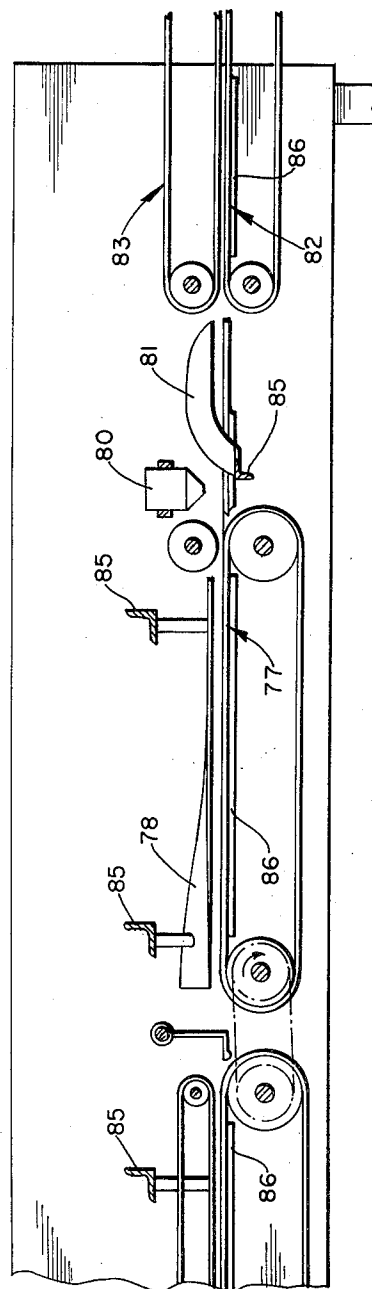
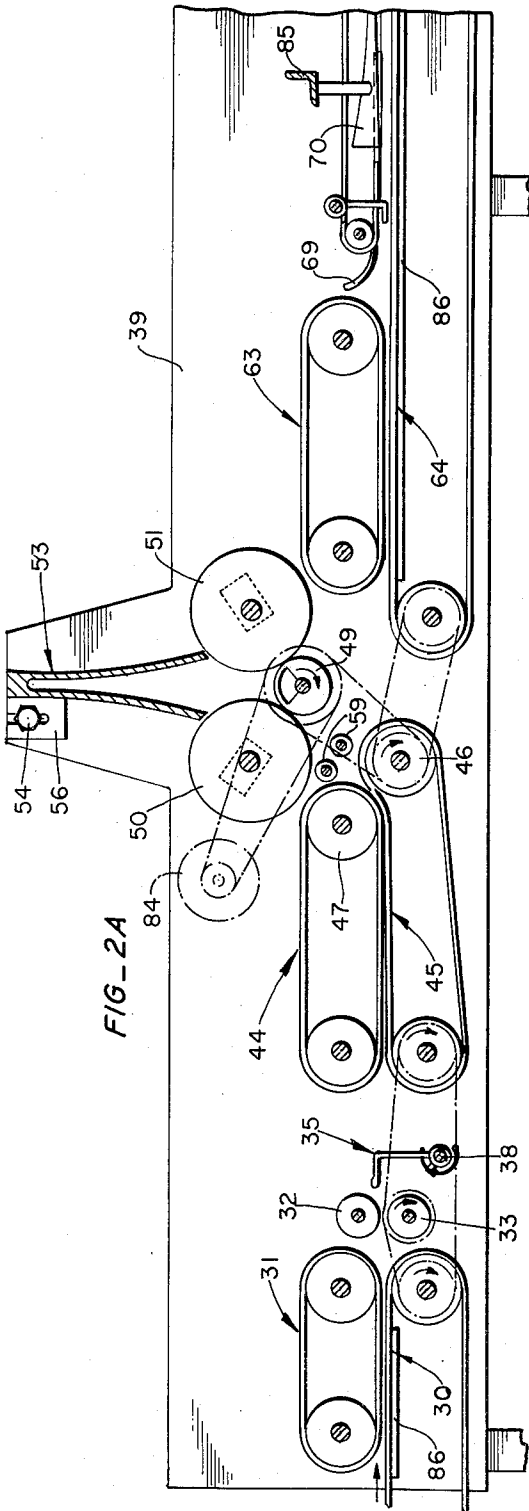
T. L. MILLICH

3,055,276

SHEET FOLDING APPARATUS AND METHOD

Filed Nov. 21, 1960

5 Sheets-Sheet 2



INVENTOR.
THOMAS L. MILLICH
BY
Boyer, Moller + Wood
ATTORNEYS

Sept. 25, 1962

T. L. MILLICH

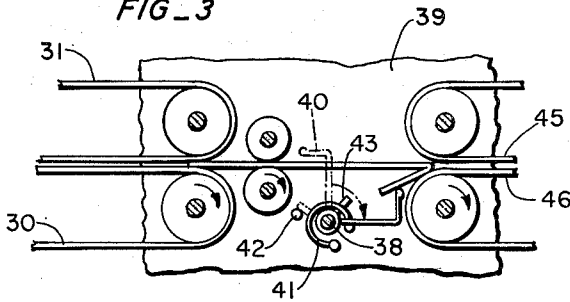
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SHEET FOLDING APPARATUS AND METHOD

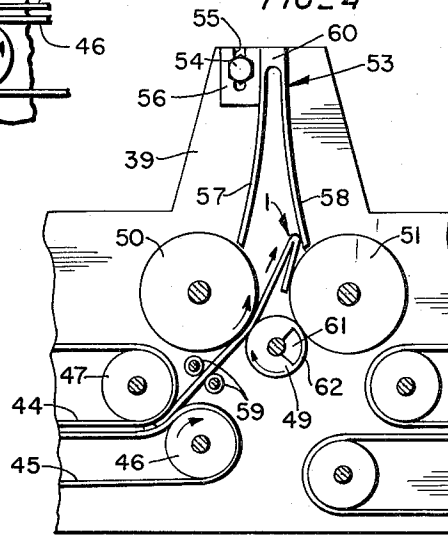
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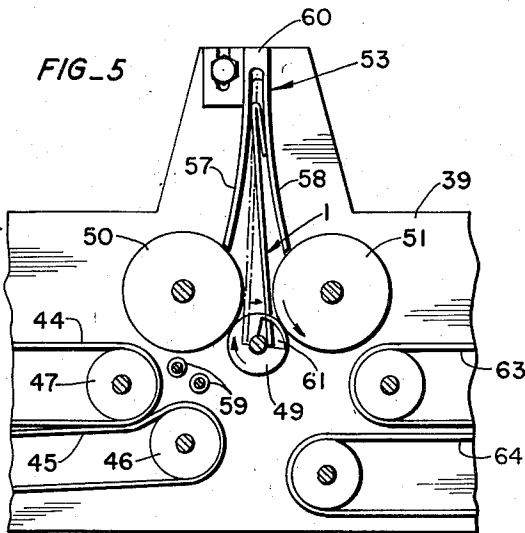
FIG_3



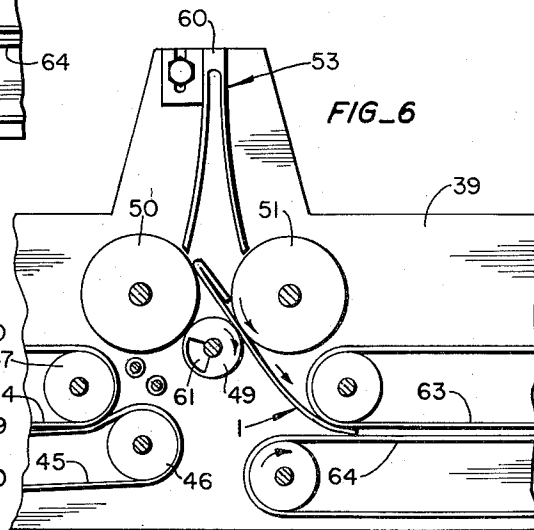
FIG_4



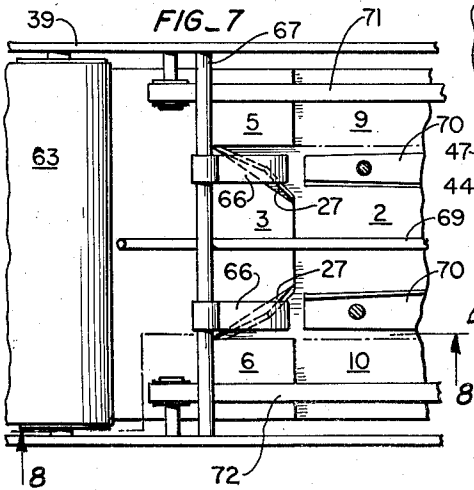
FIG_5



FIG_6



FIG_7



INVENTOR.
THOMAS L. MILLICH
BY
Boyer, Mohler & Wood
ATTORNEYS

Sept. 25, 1962

T. L. MILLICH

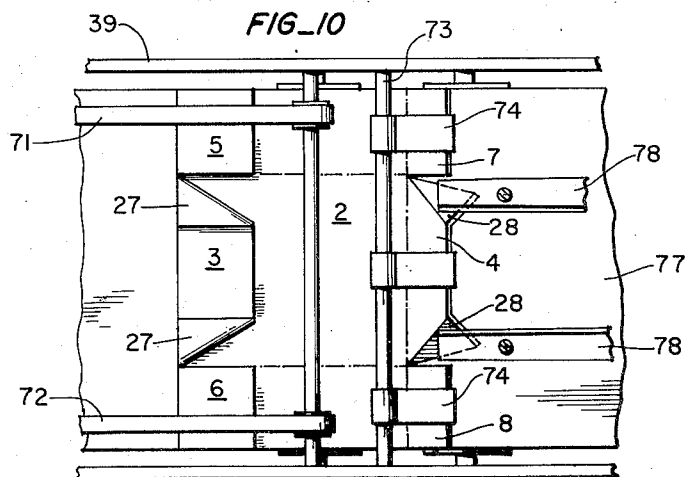
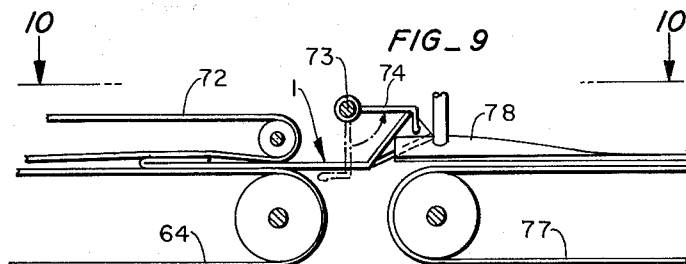
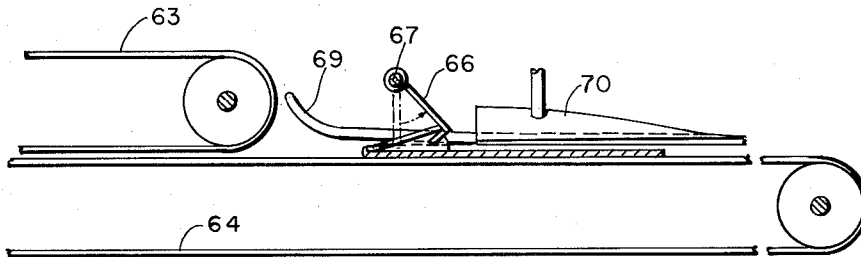
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SHEET FOLDING APPARATUS AND METHOD

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5 Sheets-Sheet 4

FIG-8



INVENTOR.
THOMAS L. MILLICH
BY
Boyer, Moller & Wood
ATTORNEYS

Sept. 25, 1962

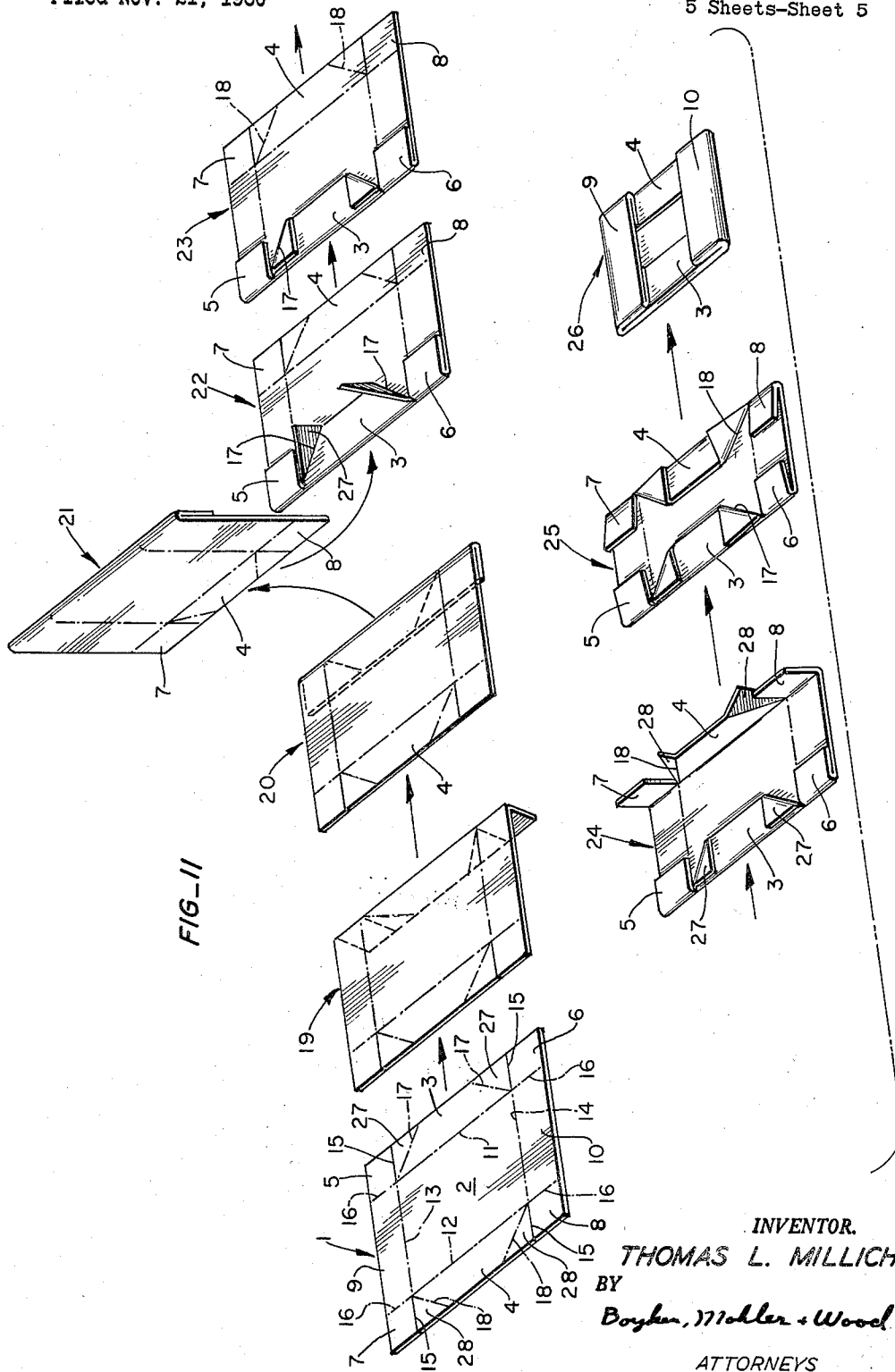
T. L. MILLICH

3,055,276

SHEET FOLDING APPARATUS AND METHOD

Filed Nov. 21, 1960

5 Sheets-Sheet 5



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3,055,276
SHEET FOLDING APPARATUS AND METHOD
Thomas L. Millich, P.O. Box 296, Beverly, Mass.
Filed Nov. 21, 1960, Ser. No. 70,696
9 Claims. (Cl. 93—49)

This invention relates to an apparatus and method for folding over two of the opposite marginal portions of a sheet of foldable material and has for one of its objects the provision of apparatus, and a method for so folding said marginal portions in a simple, fast and highly efficient manner.

In the carton making industry, and elsewhere, there is no difficulty in moving cardboard or paper-like blanks and sheets in one direction and in folding over the lateral marginal portions of such blanks along lines extending longitudinally of the direction of movement of the blanks. Ordinary folding plows, belts and the like, positioned over the path of travel of such blanks perform this function efficiently. However, fast and efficient folding of the leading and trailing flaps or marginal portions of blanks has heretofore required accurate timing of the blanks and relatively complicated mechanisms that include elements that must be in synchronization.

For example, in a conventional straight line collapsible box machine, timed devices have heretofore been commonly used to fold the trailing flaps or trailing marginal portions of the blanks crosswise relative to the direction of movement of the blanks. No particular difficulty has been experienced in folding the leading flaps or marginal portions crosswise relative to the direction of movement of the blank, since the leading edge of the blank may readily engage folding hooks or devices that will cause such leading portions to fold rearwardly as the blanks move therepast, but where folding devices must follow and fold marginal portions on the blanks forwardly, in the direction of movement of the blanks, very accurate timing is essential, and such timing is not compatible with high speed folding.

Also, in many carton structures, one of which is known as the Beers style box, portions of the flaps must be folded along lines that extend diagonally relative to the direction of movement of the blanks.

Heretofore special timing devices have been employed for folding the portions of such flaps along said diagonal fold lines, since the trailing marginal portions must be folded forwardly or in the direction of movement of the blanks, instead of being folded rearwardly.

One of the objects of the invention is the provision of a machine, and a method that are adapted to overcome the heretofore difficulties associated with the folding of opposite marginal portions of a blank or sheet.

Another object of the present invention is the provision of a machine in which the marginal portions folded crosswise by the machine relative to the direction of travel of each blank do not require any timing or synchronization of folding devices, it merely being necessary that the blanks be in line and not lapped one over the other. The degree of spacing between blanks is immaterial.

Another object of the invention is the provision of a machine in which the folding of parts of the leading and trailing marginal portions or flaps along fold lines that extend diagonally relative to the path of travel of the blanks does not require timed devices, and such folds on both the leading and trailing portions are accomplished where the free edges along each of such portions face the direction of travel of the blank, thus facilitating fast, accurate folding along said diagonal lines.

Other objects and advantages will appear in the description and in the drawings.

In the drawings FIGS. 1A and 1B, taken together, con-

stitute an isometric view of the portion of a sheet folding machine incorporating the present invention; FIG. 1A being the infeed end that includes a blank reversing mechanism, and FIG. 1B being the outfeed end.

FIGS. 2A and 2B constitute a side elevational view of the parts shown in FIGS. 1A and 2B including, diagrammatically, a drive arrangement and conventional gluers and final folding plows that are also conventional.

FIG. 3 is a fragmentary sectional view illustrating the rearward folding of a leading marginal portion of a blank.

FIGS. 4, 5 and 6 are fragmentary, vertical, sectional views illustrating the reversing mechanism and the successive steps in the reversal of a blank that moves through and past the reversing mechanism.

FIG. 7 is a top plan view of the portion of the apparatus showing the rearward folding of parts of the forwardly folded trailing marginal portion of a blank.

FIG. 8 is a fragmentary, vertical sectional view of the portion of the apparatus shown in FIG. 7 taken along line 8—8 of FIG. 7.

FIG. 9 is a fragmentary, vertical sectional view at the point in the apparatus where the leading marginal portion of the blank is folded rearwardly, and where parts on one of the flaps are folded along diagonal lines.

FIG. 10 is a top plan view of the portion shown in FIG. 9.

FIG. 11 is an isometric progressive view of a carton blank illustrating the successive steps performed by the machine of FIGS. 1A to 2B independently of the machine.

A clear understanding of the folding steps accomplished by the operation of the machine of FIGS. 1A to 2B may best be shown by referring to FIG. 11, it being understood, of course, that the invention is not restricted to the particular blank illustrated.

The blank 1 in FIG. 11, at the commencement of its travel, is usually flat but is creased, cut and possibly scored for subsequent folding steps. This blank comprises a central rectangular body portion 2, having leading and trailing marginal portions 3, 4 along two opposite edges of said blank, and shorter corner flaps 5, 6 at the ends of leading marginal portion 3, and similar flaps 7, 8 at the ends of the trailing marginal portion 4.

Side marginal portions 9, 10 are along the two lateral opposite edges of the blank, and the flaps 5, 7 and 6, 8 are at the ends of the portions 9, 10, respectively, so these flaps 5 to 8 may be said to be portions of either the leading marginal portions of the blank 1 or portions of the lateral marginal portions. Hereinafter they will be considered parts of the leading and trailing marginal portions insofar as this invention is concerned.

Parallel folding creases 11, 12 define the juncture between the central body portion 2 and the marginal portions 3, 4 respectively, while parallel folding creases 13, 14 define the junctures between the body portion 2 and lateral marginal portions or flaps 9, 10. Cuts 15 extend from the ends of folding creases 13, 14 to the free leading and trailing edges of the blank and folding creases 16 are in extensions of the ends of folding creases 11, 12 and extend to the free side edges of the blank, and diagonal creases 17 extend across the ends of marginal portions 3 toward each other while annular diagonal creases 18 extend toward each other across the ends of portions 4.

Thus blank 1 in its flat condition is moved along a horizontally extending path of travel, and positioned horizontal in said path to the right as seen in FIG. 11 to a point where the leading marginal portion 3 including the corner pieces 5, 6 at the ends thereof, are folded downwardly and rearwardly, as seen at position 19, to a position 20 in lapping relation to the body 2 and marginal portions 9, 10.

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After said leading marginal portion, including said corner pieces 5, 6 are folded to the form shown in position 20, the blank is moved to one side of said path to position 21 which is illustrated as being the upper side, until it is generally vertical, and it is stopped here and its direction of movement is reversed, so that the marginal portion 4 including corner flaps 7, 8 are now leading and the flaps 3, 5, 6 are trailing.

This reversal of direction, as will later appear, could be one in which the blank moves back over paths extending either above or below the path it followed to said reversing point. In FIG. 11, however, upon this reversal of the movement of the blank, the latter is preferably moved back to horizontal to position 22 along a path substantially in longitudinal extension of the path leading to the position 21, and the blank is moved to the right, with the marginal portions 4, 7, 8 leading.

As seen in FIG. 11, the movement of the blank continues along its second path of travel that is more or less in continuation of the first path leading to the point of reversal 21, and it is seen that the blank is also inverted in moving from position 21 to position 22 so that the marginal portion 4 and corner flaps 7, 8 are uppermost, whereas they were lowermost at position 20.

Since this reversal of the blank has resulted in the free edge of marginal portion 3 facing in the direction of movement of the blank as shown in position 22, it is relatively easy at position 22 to engage the free edges of flap 3 at its ends outwardly of the diagonal folding creases 17 to elevate these ends and for folding them onto the adjacent parts of the marginal portion 3 as the blank is moved to the right, which is done so at position 23.

As the blank continues its movement to the right, the leading marginal portion 4 including the corner pieces 7, 8 are easily engaged and folded rearwardly onto the upper side of the marginal portion 4 as seen in positions 24, 25.

By engaging the upper surfaces the end parts of the leading marginal portion 4 as the flap 4 is centrally engaged along its free edge and swung rearwardly, it will be seen that the said corner sections outwardly of the diagonal creases 18 will readily be folded against the upper sides of the rearwardly folded marginal portion 3.

At position 24 this folding step is shown and at position 25 it is completed.

It should also be noted that in positions 24, 25 that the corner pieces 5, 6 have been folded over the ends of the lateral marginal portions 9, 10.

The next step is placing glue on the upwardly facing surfaces of the folded over end sections that have been folded along diagonal lines 17, 18 and to plow the lateral marginal portions 9, 10 including corner pieces 5, 6 and 7, 8 toward each other and over the body position 2 including the said corner sections for gluing said corner pieces 5, 6 and 7, 8 to the folded over ends of flaps 3, 4.

Position 26 shows the final form of carton folded flat.

To facilitate identification of parts the ends of the flap 3 outwardly of diagonal folding creases 17 may be designated 27 while the ends of flap 4 outwardly of diagonal folding creases 18 may be designated 28.

Referring to FIGS. 1A, 2A the flat, unfolded blank 1 as seen at the left end of FIG. 1 carried horizontally on the upper run of a horizontally extending conveyor belt generally designated 30, for being carried to the right where it passes below the lower run of an endless hold-down belt 31. The blank is moved past belts 30, 31 to between upper and lower feed rollers 32, 33, and from these rollers the leading marginal portions, or flaps 3, 5, 6 are engaged by hooks 35, 36, 37 that extend upwardly from below the horizontal path of travel of the blank to across said path. These hooks are carried on a rod 38 that may be rotatably supported at its ends in bearings in the frame 39 of the machine, and which frame also rotatably supports the various shafts on the pulleys and rollers of the apparatus. Hooks 35-37 may be leaf springs bendable under the force of the blank as the latter

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is moved to the right to bend the flaps 3, 5, 6 downwardly and rearwardly, or the rod 38 may be spring urged to upright dot-dash line position 40 (FIG. 3) by a torsion spring 41 connected at one end with the frame and at the opposite end with the rod. Any suitable rigid stop 42 engageable with a member 43 on rod 38 will function to limit the counterclockwise movement of the hooks, as seen in the drawings.

These hooks 35, 36 and 37 will engage the leading edges of flaps 6, 3, 5 to swing them downwardly to the positions shown in positions 19, 20 of FIG. 11, after which the blank will be moved by rollers 32, 33 to between the lower and upper runs of upper and lower endless belts 44, 45 (FIG. 3) for movement to the reversing mechanism.

The power driven pulley 46 (FIGS. 1A, 4) at the far end of the lower belt 45, relative to the end nearest to hooks 35-37 is positioned beyond the far pulley 47 and is elevated so that the upper run of the lower belt 45 will extend partially around the pulley 47 and upwardly whereby the blank 1 (FIG. 4) will be discharged upwardly from belts 44, 45 at an angle relative to horizontal for engagement between a central or intermediate roller 49 and a roller 50 that is at the near side of the roller 49 and adjacent to belts 44, 45 while a similar roller 51 is at the far side of the roller 49 and more distant from belts 44, 45.

Rollers 49, 50 and 51 are parallel with the axes of pulleys 46, 47 and rollers 50, 51 as seen in FIG. 4 are horizontally spaced apart and may have their axes disposed in a horizontal plane.

The axes of the rollers 50, 51 are at a level above the axis of roller 49, and the shafts of both rollers 50, 51 are journaled for rotation in spring urged blocks or bearings that yieldably urge them into engagement with roller 49.

Above the space between rollers 50, 51 is an inverted, generally V-shaped member generally designated 53 having its lower edges relatively close to the surfaces of rollers 50, 51 along lines below the uppermost surfaces of said rollers and between them. This member 53 is adjustably secured at each opposite end thereof on frame 39 by a bolt 54 (FIG. 4) that extends through a vertical slot 55 in a lug 56 that is rigid with member 53.

The generally opposed legs of the inverted V-shaped member are designated 57, 58 and are plates that extend convergently upwardly in spaced relation and are connected at their upper ends by a web 60 having a curved downwardly facing surface that is adapted to engage the leading portion of the blank 1 as the latter is moved upwardly. If desired, a set of rollers 59 may be positioned between the discharge ends of belts 44, 45 and rollers 49, 50 to guide the blank 1 upwardly to between rollers 49, 50.

The horizontal lengths of the legs 57, 58 of member 53 is such as to extend substantially from end to end of rollers 50, 51 (FIG. 1).

The roller 49 is formed with an outwardly opening V-shaped groove 61 extending longitudinally thereof between its ends, but segments 62 at each end of the groove bridge the open side to provide bearings adapted to ride on rollers 50, 51 when the V-shaped groove passes across the surface of each of said rollers.

The downwardly facing curved closed end of member 53 at the web 60 is spaced from the closed end of groove 61, when the latter faces the closed end of member 53 a distance that is preferably slightly less than the distance between the leading edge of blank 1 (which is along the crease line 11), and the trailing edges of the flaps 4, 7, 8.

When the blank 1 is fed between rollers 49, 50 in an untimed relation, the trailing edge of the blank will, at the end of its upward movement, enter the groove 61 and the lower edge will be carried clockwise, as seen in FIG. 5 to a position between the roller 49 and roller 51 and said roller 49 and roller 50 will then carry the blank in a

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reverse direction in which the previous trailing edge along flaps 8, 4, 7 will become the leading edge.

As seen in FIG. 6, the flaps 8, 4, 7 will be engaged between the lower and upper runs of upper and lower endless belts 63, 64 for movement between said belts away from the reversing device 53. Preferably, belts 63, 64 extend horizontally and longitudinally of the belts 44, 45 that lead to the reversing device 53, and the blank 1 as it is carried away from said device 53 will have the previously folded flaps 3, 5, 6 on the upper side of the blank and in a trailing position, but with their free edges leading.

The position of the blank now is such that easy, rapid and accurate folding of the end parts 27, 28 respectively, at the ends of flaps 3, 4 can be accomplished without employment of special timing devices as have heretofore been used, and at this point it may also be emphasized that the blanks are not timed relative to the groove 61 in roller 49. The trailing edges of the blanks will automatically enter the groove during rotation of roller 49 irrespective of the position of the roller 49 at the time the blank is engaged between rollers 49, 50.

Upon the blank approaching position 22 (FIG. 11), the inherent resiliency of the flap 3 after bending will tend to spring the leading edge thereof slightly away from the body 2 carrying portions 27 with it so that depending hooks 66 (FIGS. 1B, 2A, 7, 8) supported from a rod 67 mounted similarly to rod 38, but above the path of travel of the blank, will engage the leading edge of each portion 27 to bend the portions 27 of flap 3 rearwardly to positions over said flap, while a hold-down rod 69 rigid with frame 39 and extending longitudinally of the belt 64 midway between hooks 66 will hold the main body of the flap 3 against bending rearwardly. After the end portions 27 of flap 3 are bent rearwardly onto said flap, conventional hold-down strips 70 rigid with frame 39 will hold the end portions 27 against the flap 3 as the blank is moved along its path of travel toward the right (FIG. 1B).

Endless spaced belts 71, 72 extending over the blank supporting conveyor will bear against the upper surfaces of the lateral flaps 6, 10, 8, and 5, 9, 7 during the folding of the ends 27 of flap 3 (FIG. 1B).

The far ends of endless belts 64 and 71, 72 that are remote from the reversing device 53 terminate at approximately the same distance from said device. Just beyond said terminating ends of said belts is a horizontal rod 73 (FIGS. 1B, 2B, 9, 10) similar to rod 67 and mounted similarly to rods 38, 67 but positioned above the path of travel of the blanks, and which hooks are adapted to engage the leading edges of flaps 7, 4 and 8 respectively to bend said flaps rearwardly over the adjoining parts of the blank. These hooks, like hooks 35, 36, 37 on rod 38, and like hooks 66 on rod 67, will automatically release the flaps engaged thereby after the flaps have been bent rearwardly, and will then automatically return to flap engaging position by means such as described for hooks 35-37 after the blank has passed below the latter.

Just beyond hooks 74 and in longitudinal alignment with the conveyor belt 64 is an endless conveyor belt 77 onto which the blank 1 passes from belt 64, and over the upper run of belt 77 are a pair of strips 78 that are upwardly curved at their ends adjacent to belt 64, and positioned to engage the end corner pieces 28 at the ends of flap 4 as this flap is pulled upwardly by the central hook 74. This causes said corner pieces to fold forwardly as the remainder of flap 4 is folded rearwardly by said hook as indicated in position 24 of FIG. 11, and in FIG. 1B.

Continued movement of the blank on conveyor 77 results in the flaps 4, 7, 8 being folded flat against the blank while the corner pieces 28 are flat against the flap 4 as seen in position 25 of FIG. 11.

As said movement continues, it should be noted that the ends of the hooks 74 are rounded to freely pass over

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the trailing flaps 3, 5, 6, instead of catching on the leading edges of said flaps.

After the blank that has been folded to the form shown in position 25 of FIG. 11 passes the hold-down strips 78, it may pass below conventional gluers 80 (FIG. 2B) that deposit glue on the upwardly facing surfaces of either the corner pieces 27, 28 or on the upwardly facing surfaces of flaps 5-8, or both, and from the gluers the blank passes below conventional plows 81 that fold the lateral flaps 5-10 to the positions shown in position 26 of FIG. 11 in which the flaps 5-8 are glued to the corner tabs or pieces 27, 28.

From the plows 81 the blank may pass between the upper run of a conveyor belt 82 and a conventional hold-down belt 83.

The gluers, plows and belts 82, 83 are conventional in box making machines.

FIGS. 2A and 2B semidiagrammatically illustrate the drive connections from a drive motor 84, the dot-dash lines indicating belts, chains and pulleys or sprocket wheels, which ever are desired.

The frame 39 carries bearings for the pulley shafts, rollers, rods, and the like that extend between the opposed sides of the frame. Suitable cross frame members, such as indicated at 85 in FIGS. 2A and 2B, may support the strips, such as strips 70, 78 and rod 69, and conventional supports 84 (FIGS. 2A, 2B) may slidably support the upper runs of the conveyor belts wherever desired.

It is pertinent to note that the reversing device may be positioned generally horizontally, instead of vertically, to reverse the direction of the blank so the blank will pass over or below the conveyor belt 45 or in any other desired direction, depending upon the direction in which the blank is carried after it emerges from between rollers 49, 51, but the present structure is preferable since it positions the blank as seen in positions 22-25 (FIG. 11) for folding over the end portions 27, 28 of flaps 3, 4 without requiring devices that are timed to the movement and position of the blank. In other words, the operation of the present device is not dependent upon the synchronization of elements relative to the blank, or vice versa. The blanks may be widely or closely spaced or both, and the operations of folding will be just as efficient, with no delays for clearance of leading blanks, as is required in the folding machines that carry the blank along paths extending at right angles to each other.

Some of the possible changes have been pointed out or suggested above, and others will readily suggest themselves to those skilled in the art. It is therefore not intended that the invention be limited otherwise than as required by the scope of the appended claims, with due regard to the spirit as well as the literal wording thereof.

I claim:

1. The method of folding two opposite marginal portions of a sheet of foldable material onto the body of such sheet that comprises the steps of: moving said sheet along a path of travel with one marginal portion of said two thereof leading the other marginal portion, folding said one marginal portion onto one side of said body during said movement, then reversing said sheet end for end in the direction of the movement of said sheet and inverting said sheet whereby said other marginal portion is leading said one marginal portion and said one side of said body faces a direction opposite to the direction faced thereby during said folding of said one marginal portion, and thereafter folding said other marginal portion onto said body while said other marginal portion is leading said one marginal portion.

2. The method of folding two opposite marginal portions of a sheet of foldable material onto the body of such sheet that comprises the steps of: moving said sheet along a horizontally extending path of travel with one marginal portion of said two thereof leading the other marginal portion, folding said one marginal portion onto one

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side of said body during said movement, then reversing said sheet end for end in the direction of the movement of said sheet and inverting the latter whereby said other marginal portion is leading said one marginal portion and said body is inverted and thereafter folding said other marginal portion onto said body while said other marginal portion is leading said one marginal portion.

3. The method of folding the marginal portions of a flat sheet along two opposite edges thereof onto the body of said sheet that comprises the steps of: moving said sheet in the plane thereof in one direction in a first straight path of travel with one edge of said two thereof leading the other edge opposite thereto, folding the marginal portion along said one edge rearwardly relative to said direction of movement to a position lapping the part of said body adjoining said marginal portion, whereby said one edge will face rearwardly relative to said one direction, then moving said sheet with said marginal portion leading through a plane that is substantially perpendicular to said first mentioned plane and swinging said other edge relative to said marginal portion in said one direction to a position in which said other edge is leading said marginal portion, then moving said sheet in the plane thereof in said one direction but in a second path of travel and folding the marginal portion of said blank along said other edge rearwardly relative to the direction of movement of said blank and to a position lapping the part of said blank adjoining said last mentioned marginal portion.

4. The method as defined in claim 3 that includes the step of folding rearwardly relative to said one direction of movement portions of the marginal portions along said two opposite edges after said sheet is in said second path and is moving in said one direction.

5. The method of folding a cardboard blank having folding flaps along two opposite edges thereof that comprises the steps of: moving said sheet along a path of travel with one edge of said two thereof leading the other edge, folding the folding flaps along said one edge onto one side of said body during said movement, then reversing said sheet end for end in the direction of the movement of said sheet and inverting said sheet whereby the folded flaps along said one edge will lead said other edge and whereby said last mentioned folding flaps will face a direction opposite to that faced thereby when said flaps were folded, then folding the flaps along said other edge onto said carton and folding portions of the flaps along both of said edges onto said flaps during said movement.

6. The method of folding a cardboard blank having folding flaps along two opposite edges thereof that comprises the steps of: moving said sheet along a horizontally extending path of travel in one direction with one edge of said two thereof leading the other edge, folding the folding flaps along said one edge downwardly and below the lower side of said body during said movement, then, at a point in said path, moving said blank to one side of said path and reversing said sheet end for end and inverting it at said point and then continuing movement of said blank in said one direction in a generally horizontally extending path with the previously folded flaps uppermost and trailing said other edge, and then folding the flaps along said other edge onto the upper side of said blank.

7. The method of folding a cardboard blank having folding flaps along two opposite edges thereof that comprises the steps of: moving said sheet along a horizontally extending path of travel in one direction with one edge of said two thereof leading the other edge, folding said folding flaps along said one edge downwardly and below the lower side of said body during said movement whereby said one edge will face in a direction opposite to the direction of movement of said blank, then, at a point in said path, reversing said sheet end for end and inverting said blank and then continuing said movement in said one di-

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rection whereby said other edge will lead the flaps along said one edge and whereby both of said two edges will face in the direction of movement of said blank, and thereafter folding portions of the flaps along said opposite edges onto the flaps carrying said portions while said blank is moving in last mentioned direction.

8. In a blank handling machine, a blank inverting mechanism comprising: a pair of rollers in horizontally spaced, side by side relation, means supporting said rollers for rotation about horizontal axes, a central roller intermediate said pair of rollers in yieldable engagement with the latter for simultaneous rotation therewith in directions for movement of a blank adapted to be engaged between one roller of said pair and said central roller in one direction and for movement of such blank in an opposite direction when engaged between the other roller of said pair and said central roller, blank supporting and moving means for supporting said blank substantially horizontally and with one side facing upwardly in a position adjacent to said one roller and for moving one edge of said blank to between said one roller and said central member for said movement in said one direction, stationary stop means at the side of said one roller that is substantially opposite to said blank supporting and moving means spaced from said one roller and said central roller for engagement by said one edge of said blank and for obstructing further movement of such blank in said one direction, means on said central roller for moving the trailing edge of said blank that is opposite to said one edge to said other roller of said pair and to the line of engagement between said central roller and said other roller upon movement of said blank in said one direction being obstructed by said stop means whereby said blank will be moved between said other roller and said central roller in a reverse direction, and blank receiving and supporting means adjacent to said other roller for receiving blank from between said other roller and said central roller and moving said blank in a direction generally away from said blank supporting and moving means with the other side of said blank that is opposite to said one side thereof facing upwardly.

9. In a blank folding machine for folding a pair of flaps respectively at two opposite edges of a blank over the same side of the body of the blank between said edges comprising: a first blank supporting means movable substantially horizontally in one direction on which said blank is adapted to be carried in a horizontal position in a horizontally extending path of travel with one flap of said pair thereof being a leading flap in a leading position and with the other flap of said pair being a trailing flap in a position trailing said leading flap; means connected with said movable means for so moving it in said one direction; a first flap folding means positioned at a point along said path and extending across the latter for engaging said leading flap and for folding it over the upper side of said body of said blank as said blank is carried past said first blank folding means by said first blank support; said first blank support terminating in a discharged end past said first blank folding means in the direction of movement of said first blank support and; means at said discharge end for directing the leading end of said blank upwardly; blank inverting and reversing means adjacent to said discharge end of said first blank support for moving said blank upwardly to a vertical position and for swinging said trailing flap and lower end of said blank past a vertical plane in which said blank is adapted to be moved and in the same direction as said blank support is adapted to move said blank when the latter is thereon; a second blank supporting means spaced from the discharge end of said first blank supporting means and generally in longitudinal alignment with said first blank supporting means having a blank receiving end adjacent to said discharge end and adjacent to said blank inverting and reversing means; means connected with

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said second blank supporting means for moving it in the same direction as said first blank supporting means is adapted to be moved; means at said blank receiving end of said second blank supporting means adapted to engage said trailing and lower end of said blank after the latter has been swung past said vertical plane for moving said blank onto said second blank supporting means for moving with the latter in a new horizontally extending path of travel with said blank inverted and reversed in end to end relation from its position on said first blank supporting means whereby said one flap will

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be in a new trailing relation to said other flap and in a position above said body; means along said new path of travel extending across the latter adapted to engage said other flap upon movement of said blank therepast for folding said other flap over the upper side of said body.

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