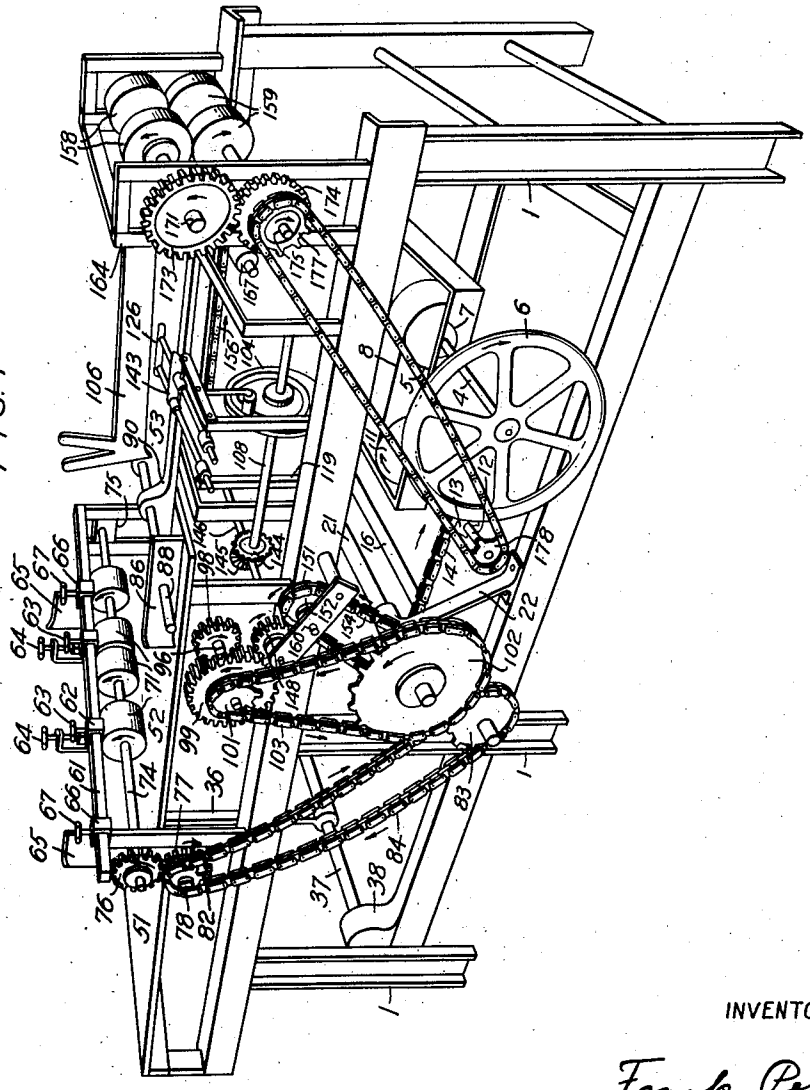
Sept. 29, 1936. F. PEPPER 2,055,984

PAPER FOLDING MACHINERY

Filed Nov. 22, 1934 7 Sheets-Sheet 1

FIG. 1



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by Samuel Astrolenke

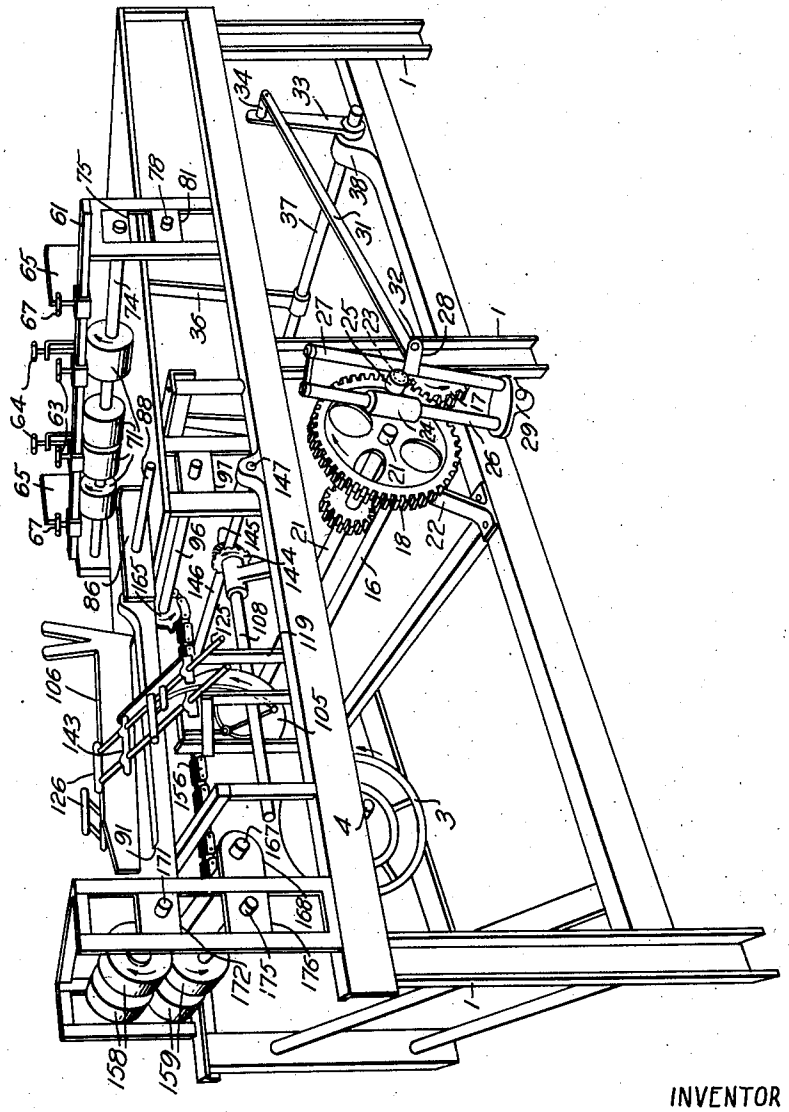
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PAPER FOLDING MACHINERY

Filed Nov. 22, 1934 7 Sheets-Sheet 2

FIG. 2



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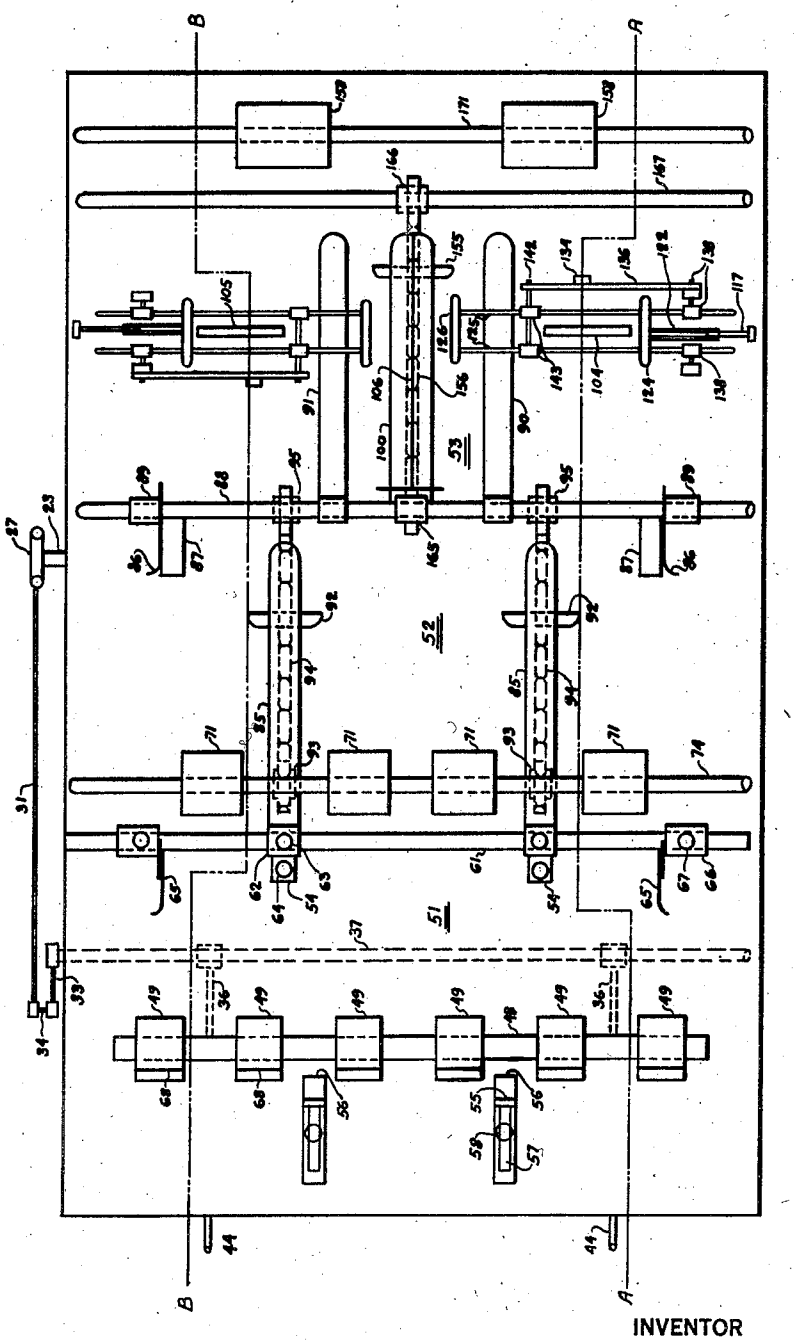
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FIG. 3



INVENTOR

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BY

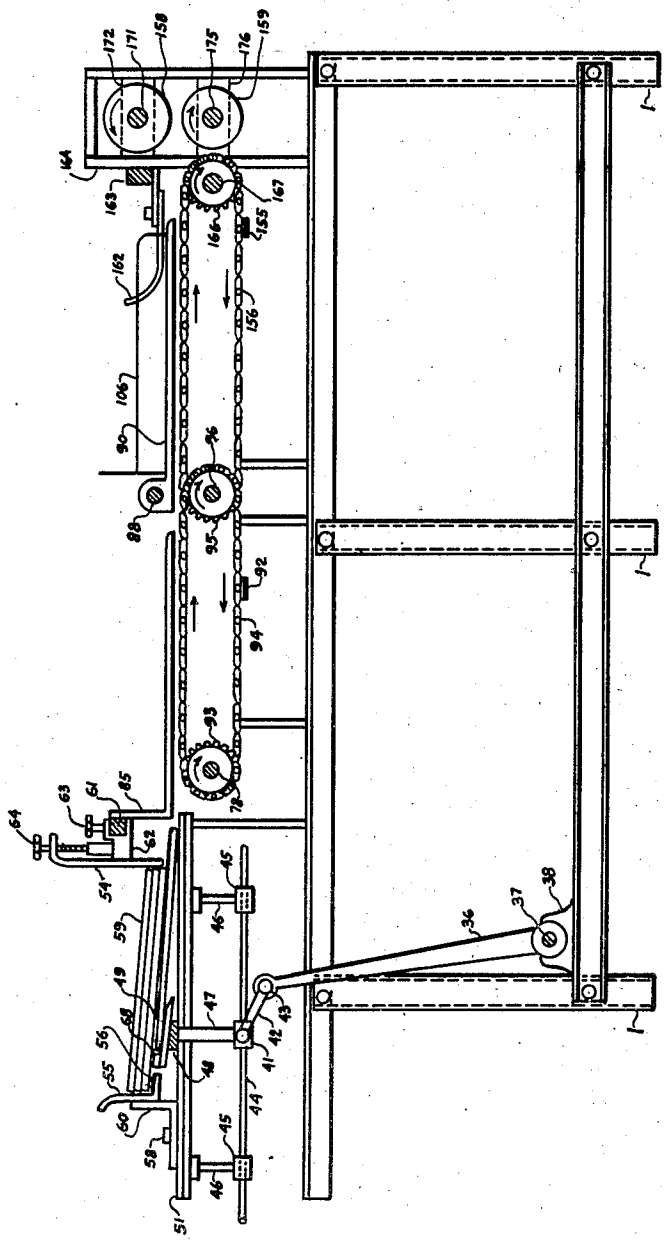
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FIG. 4



SECTION A-A IN FIG. 3

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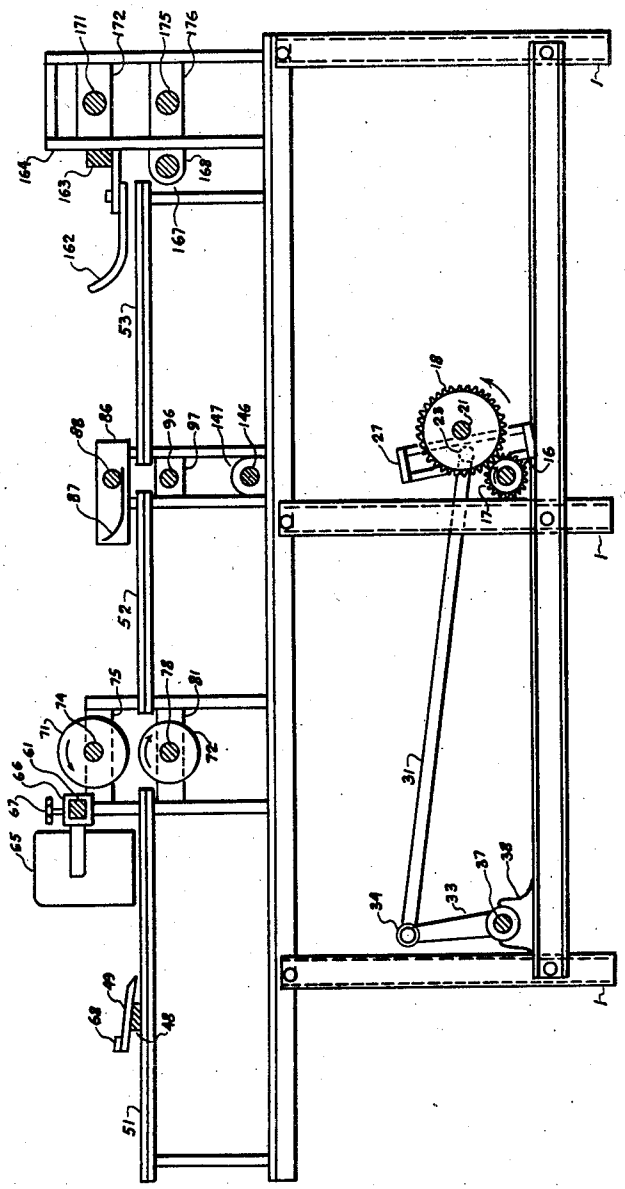
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FIG. 5



SECTION B-B IN FIG. 3

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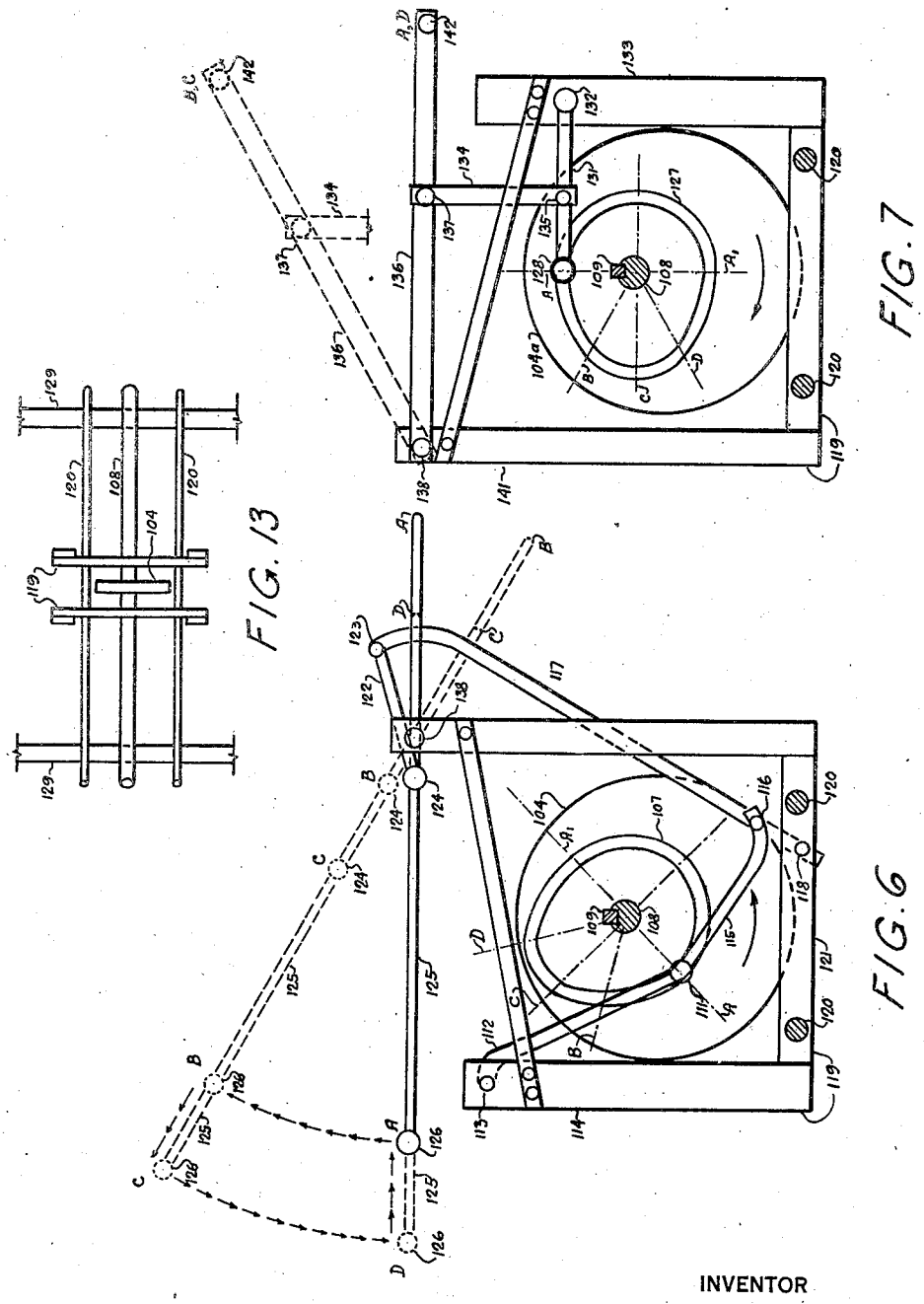


FIG. 7

FIG. 13

FIG. 6

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Sept. 29, 1936. F. PEPPER 2,055,984

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FIG. 9

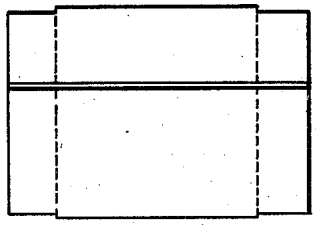


FIG. 11

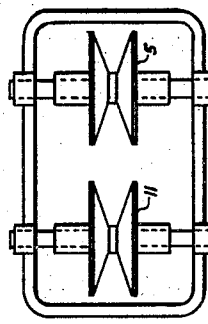


FIG. 12

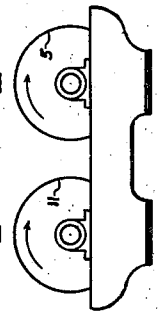


FIG. 8

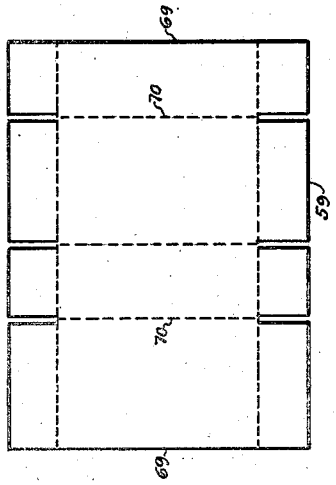
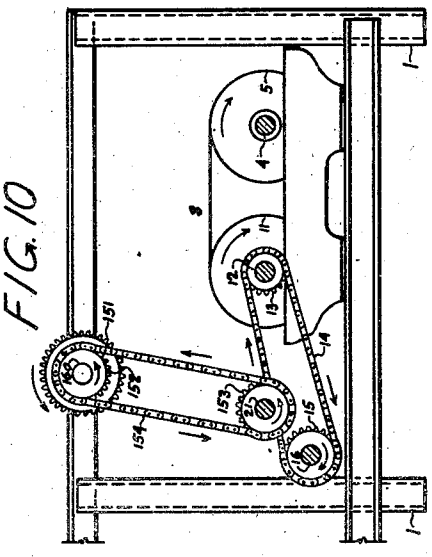


FIG. 10



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Patented Sept. 29, 1936 2,055,984

UNITED STATES PATENT OFFICE

2,055,984

PAPER FOLDING MACHINERY

Frank Pepper, Ozone Park, N. Y., assignor to S & S Corrugated Paper Machinery Company, Brooklyn, N. Y.

Application November 22, 1934, Serial No. 754,243

9 Claims. (Cl. 93—49)

My invention relates to paper box machinery and more particularly relates to novel apparatus for and methods of folding paper blanks.

In the manufacture of corrugated boxes, the corrugated paper must go through three main stages of progress.

The paper is first cut to the required size. This sheet, or as it is more frequently called, blank, is then scored longitudinally and transversely along the lines required for the subsequent folding of the box. It is also sliced or blocked in various places at the flaps in order to permit these flaps to be folded over to form the top and bottom of the box.

This blank now properly scored, is folded along the scored lines and pressed down flat, thus preparing it for the third stage which consists of taping the central portion of the body of the blank with suitable adhesive. Heretofore in the folding process some difficulties have been experienced in preventing the folded flaps from drifting from a fold directly along the scored edge.

In carrying out my invention, the blanks need only be stacked against a pair of stops or hoppers provided in the machine. Henceforth the movements are all automatic, all parts of the machine working in constant motion and proper alignment while they are being folded over the scores and finally pressed down and delivered by a set of rollers ready for the taping.

Accordingly, an object of my invention is to provide novel apparatus for and methods of folding blanks along scored edges.

A further object of my invention is to provide novel cam operated fingers which pass through a complicated movement in folding the blanks.

Still a further object of my invention is to provide simple speed and size adjustments for operating the machine at any desired speed and for any desired size and shape of blank.

Still another object of my invention is to provide means of and machinery for folding and pressing the blanks preparatory to taping and to do this in one continuous automatic movement.

There are other objects of my invention which together with the foregoing will appear in the detailed description which is to follow in connection with the drawings in which:

Figure 1 is a perspective of the machine as viewed from one side, showing the frame of the machine and all the main gears, sprockets and chains as well as part of the rollers and the cam mechanism which does the folding.

Figure 2 is a perspective of the same machine viewed from the opposite side, showing some of the driving machinery that was invisible from the other side.

Figure 3 is a plan of the machine with special emphasis given to the mechanisms that move the blank from one part of the table to another.

Figure 4 is a diagrammatic longitudinal sectional view of the machine along the line A—A (Figure 3) showing the reciprocating apparatus that feeds the blanks under the hopper and the chains and lugs that move the blanks along the table.

Figure 5 is a diagrammatic longitudinal sectional view of the machine along the line B—B (Figure 3) showing the rollers that feed the blank onto the second platform, and the various guides that keep the blank in alignment.

Figures 6 and 7 are detailed diagrammatic views of the two sides of the cam mechanism which folds the sides of the blank along the scored lines.

Figure 8 shows a typical blank as it appears when it is about to be fed into our machine, scored and sliced, but not yet folded.

Figure 9 shows the same blank as it appears when it is fed out of the folding machine ready for the taping.

Figure 10 shows a diagrammatic sectional view of part of table in Figure 1 in order to expose concealed parts of Figure 1.

Figure 11 is a plan of the variable speed transmission unit used in connection with the folding machine.

Figure 12 is a diagrammatic longitudinal elevation of variable transmission unit shown in Figure 11.

Figure 13 is a diagrammatic plan of cam 104 intended to show the manner in which the cam is adjusted longitudinally and laterally with reference to the main frame of the machine.

Referring to Figure 2, I have shown a metal framework 1, designed to support the various parts of the driving mechanism and the platforms over which the blanks must pass in order to be folded and pressed.

Suitably mounted thereon is a source of power (not shown) which transmits its motion through pulley 3 and shaft 4 to bevel-faced disc 5 of a variable speed transmission unit shown in detail in Figures 10 and 11. Disc 5 may also be driven by means of a hand wheel 6 through shaft 4 suitably mounted for rotation in bearings 7 Fig. 1.

Disc 5, in turn, transmits its motion through V-belt 8 to bevel-faced disc 11 which is secured to properly journalled shaft 12 on which is mount-

ed sprocket 13 rotatable with shaft 12. By causing the V-belt to engage different parts of the disc 11, any desired speed ratio to the speed of the driving source can be obtained. Sprocket 13 is connected by means of continuous chain 14 to sprocket 15 (Fig. 10) which is mounted for rotating on one end of shaft 16, suitably journalled in bearings. Secured to the opposite end of shaft 16 is pinion 17 (Figures 2 and 5) which meshes with cog-wheel 18 secured to and driving shaft 21 which is supported by braces 22.

Eccentrically located on cog-wheel 18 is pin 23 upon which is pivoted sleeve 24 by means of a projecting cap 25. Sleeve 24 is slideable along rods 26 which together with rod 27 forms yoke 29. The rod 27 has an adjustable clamp 28 which is connected to rod 31 by cotter pin 32. Thus the sleeve 24 with the rods 26 and 27 forming yoke 29 are pivotally mounted on the pin 23 about which it is rocked.

As cog-wheel 18 rotates, rod 31 imparts reciprocal movement to arm 33 to which it is connected through pin 34. To vary the limits of the swing of arm 33 in its reciprocating motion, it is merely necessary to shift the position of clamp 28 along rod 27. If clamp 28 is raised, the limit of the reciprocating movement to the right is extended. If clamp 28 is lowered, the limit of the reciprocating movement to the left is extended.

Furthermore, as sleeve 24 slides along rod 27 it causes a precession movement in yoke 29 which results in a greater swing of the yoke in parts furthest removed from the centre of the yoke at 23. Therefore, the nearer to the ends of rod 27 clamp 28 is secured, the greater will be the swing of rod 31 and arm 33.

As arm 33 reciprocates, it imparts reciprocal motion to a pair of arms 36 through shaft 37 (Figure 3) which is mounted in bearings 38 Fig. 1.

As shown in Figure 4, arm 36 connects to clamp 41 through rod 42 and pin 43. Clamp 41 is secured to rod 44 which slides freely inside sleeves 45 depending from platform 51 by means of extension bars 46.

Clamp 41 carries a bar 47 which projects upwardly in slots between strips in platform 51 and carries at its upper end a bar 48 extending across platform 51. On bar 48 there are mounted a number of lugs or fingers 49 whose reciprocal movement is accomplished by means of the train of arms and gears mentioned above.

The operations thus far described will now be clear. As the motor rotates, power is supplied through pulley 3, shaft 4, discs 5 and 11, shaft 12, sprocket 13, chain 14, sprocket 15, shaft 16 and pinion 17 to cog-wheel 18. As cog-wheel 18 rotates it reciprocates rod 31 which in turn produces a reciprocating movement in arm 33, shaft 37, arms 36, pin 43, rod 42 and bar 47 to platform 49. Reciprocating movement is thus imparted to platform 49 to feed blanks from a pile, one at a time as will now be described.

In Figure 3, I have shown a plan view of the table showing the location of the three platforms 51, 52 and 53 over which the blanks are to pass in the process of folding, but with the actual boards of the platforms removed for convenience of illustration.

The blanks 59 such for example as shown in Figure 8 are first stacked on platform 51 (Figure 4) fitting closely between gauge 54 and back stop 55. On the side nearest stop 55, the blanks are resting on shelf 56 integral with back stop 55.

Back stop 55 supported on bracket 60 is secured by nut and bolt 58 to platform 51. By loosening bolt and nut 58, bracket 60 because of slot 57 can be slid to effect a longitudinal adjustment of back stop 55 (Figure 3). This adjustment permits folding of different sized blanks. Gauge 54 (Figure 4) is clamped to a bar 61 through a block 62 and set screw 63. A groove extending the length of gauge 54 encloses a projection of block 62 in such a manner that gauge 54 can slide vertically with reference to block 62. This makes it possible to so adjust gauge 54 vertically through turn screw 64 as to leave just enough space between its lower end and the platform 51, so that only one blank can pass under it at one time. This adjustment permits the successive passage of single blanks of any desired thickness.

At the same time guides 65 (Figures 3 and 5) having outwardly flaring ends and secured to bar 61 by means of clamps 66 and set screws 67 are adjusted laterally so as to guide the feeding of blanks of any desired width to rolls as will be described hereinafter. Thus simple, easily operable adjustments are provided for different size blanks.

As the feeding of the blanks is about to begin, fingers 49 (Figure 4) have been moved to their extreme left position, to the rear of back stop 55 and the blanks. Accordingly projections 68 do not touch the blanks. As a result of the reciprocating movement imparted thereto, fingers 49 now move forward.

It will be noted that projection 68 extends above the surface of shelf 56 just sufficient to engage only one of the blanks resting on platform 56 as finger 49 moves forward. Accordingly, it will engage and propel forward the lowermost blank 59, removing it from shelf 56. As the rear end of blank 59 is carried beyond the edge of shelf 56, it drops to platform 49. Platform 49, it will be noted, is at a lower level than platform 56 so that as the adjacent blank falls on shelf 56, there still remains a space between it and blank 59. Accordingly, blank 59 is relieved of the weight of the blanks above as it is pushed under hoppers 54.

Near the foremost end of the movement of finger 49 the forward end of blank 59 is fed between rollers 71 and 72 (Figure 5). Rollers 71 and 72 now engage the blank by friction and propel it forward onto platform 52 until the entire blank has passed from under the rollers 71 and 72. Blank 59 thus comes to temporary rest on platform 52.

As shown in Figure 1, rollers 71 are mounted on and rotatable with shaft 74 which is supported in bearings 75. Shaft 74 receives its motion from pinion 76 which meshes with pinion 77. Pinion 77, in turn, is mounted on shaft 78 supported in bearings 81 (Figure 2) and carrying the sprocket roller 82.

Sprocket 82 (Figure 1) is connected to sprocket 83 through continuous chain 84. Sprocket 83 is mounted on shaft 16 which derives its power in the manner described above. It will be understood that speed ratio through the chain from shaft 16, sprocket 83, chain 84, sprocket 82, shaft 78, gears 77 and 76 and through shaft 74 to rollers 71 is such that rollers 71 rotate at just the right speed to feed the blank 59 through at a speed coordinated with the speed of the reciprocating platform 49.

The blank 59 is propelled by rollers 71 and 72 between platform 52, and a pair of adjustable

guides 85 (Figures 3 and 4) which are clamped to bar 61. At the same time the blank is kept from drifting laterally by a pair of outwardly flaring guides 86 (Figures 3 and 5) and from curling up at the edges by a pair of guides 87 all of which are secured by adjusting clamps 89 to rod 88 extending across platform 52.

As soon as the rear of the blank has rolled out from under rollers 71 and 72, a pair of lugs 92 (Figures 3 and 4) reach the top of a pair of sprockets 93, press against the rear edge of the blank and continue to propel it along platform 52 and onto platform 53 under guides 90, 91 and 100 (Figures 3 and 4).

Lugs 92 are attached to a pair of continuous chains 94 which connect sprockets 93 and 95. Sprockets 93 are mounted on shaft 78 whose drive has already been described. Sprockets 95 are mounted on shaft 96 which is rotatably mounted in bearings 97 (Figure 2). Shaft 96 carries on one end thereof, the pinion 98 (Figure 1) which meshes with idler 99. Idler 99 is concentric with and drives sprocket 101 which connects with sprocket 102 through continuous chain 103. Sprocket 102 is mounted on shaft 21 which is supported on braces 22 as was explained above. Shaft 21 derives its power in the manner described above and in turn imparts rotation through sprocket 102 and 101, gears 99 and 98 and through shaft 96 to sprocket 95. The speed rates, it will be understood, are such that sprockets 95 are driven in timed relation with sprockets 93 to impart a speed to chain 94 coordinating with the previous rate of feeding the blank 59.

Lugs 92 (Figures 3 and 4) are so positioned on chain 94 in relation to the movement of platform 49 that when they have reached the top of sprockets 93, the blank 59 will have been fed to platform 52 ready to be fed to platform 53. Lugs 92 then engage the edge of the blank and as the lugs move forward feed the blank on to the platform 53 until, as lug 92 passes around sprocket 95, the blank is completely on platform 53 in preparation for folding.

When the blank 59 is in position for folding, its middle section is held securely under adjustable guides 90, 91 and 100, which are clamped on rod 88. Guides 90 and 91 will be spaced along rod 88 a sufficient distance apart so that they bear along the score lines 70 of the blank, and the flaps 69 of the blank will project beyond the guides in the direction of the cams 104 and 105. Guide 100 is so located that if the two flaps of the blank are folded over they will meet along the center line of the guide and will just touch the long blade 106 that is mounted over guide 100.

The blanks are now in position to be folded by cams 104 and 105. Figures 6 and 7 are detailed diagrammatic views of the two sides of cam 104. Cam 105 is an exact counterpart of cam 104. As shown in Figure 6, the cam 104 consists of a circular plate 104 in which an eccentric groove 107 is cut. Cam 104 is mounted off center upon shaft 108 to which it is locked by key 109. Shaft 108 is driven from the main source in a manner to be described hereinafter and carries with it cam 104. As cam 104 rotates, a follower 111 is made to travel inside groove 107. The follower 111 is connected on one side to the moving arm 112 pivoted on pin 113 in bar 114 which makes up part of frame 119 of the cam, and on the other to link 115 which is pivoted to pin 116 in arm 117.

Arm 117 is in turn pivoted on pin 118 in bar 121. The other end of arm 117 is connected to a pair of links 122 through pin 123. Links 122 are pivoted on pin 124 which is securely fastened to arms 125 which are free to slide in sleevelike extension of pins 138 pivoted in frame 119. The two arms 125 are interconnected by cross arms 126 at one end thereof.

In Figure 7 a groove 127 is cut in plate 104*a* which is rigidly connected to plate 104. A follower 128 travels inside this groove as the cam revolves. Bar 131 is pivoted at one end to follower 128 and at the other to pin 132 in bar 133 of the frame 119. Link 134 is pivoted to bar 131 through pin 135 and to bar 136 through pin 137.

Bar 136 is pivoted to pin 138 in bar 141 of the frame of the cam on one end, and to pin 142 on the other. Pin 142 connects bar 136 to arms 125 through yoke 143 (Figure 3) which allows free sliding motion to local movements—the vertical movement of bar 136 and the horizontal movement of arms 125 now to be described.

In Figures 6 and 7 arms 125 and bar 136 are shown in the position in which they are found at the moment when the blank 59 has just come to rest on platform 53, and the folding process is about to begin. The successive folding steps occur as follows:

As the cam 104*a* rotates, follower 128 traveling in the cammed groove 127 rocks arm 131 clockwise about pivot 132. Link 134 is raised in turn raising arm 36 counterclockwise about its pivot 138 to the dotted position shown. As arm 136 is raised, it in turn, through pins 142 raises the arms 125 from position A to the dotted position B shown in Figure 6. It will be recalled that the outer flap of blank 59 lies on the cross arm 126 and is accordingly turned upwardly about its scored edge as arm 126 is raised. This is the first movement.

As cam 104 continues to rotate, follower 111 traveling in cammed groove 107 carries link 115 to the left, rocking arm 117 counterclockwise about pivot 118. This occurs immediately following the raising movement effected by cam 104*a* described. As arm 117 rocks counterclockwise, it pushes arm 125 outwardly to the dotted position C. This further turns the flap of the blank about its scored edge.

Next cam 104 on further rotation, restores arm 136 to its original lowered position bringing arms 125 to position D and completing the folding of the flap of blank 59.

The cycle is now completed by cam 104 which restores arms 125 to their original position.

At the completion of the cycle, cam 104 has completed one half of its revolution. During the remaining half of the revolution, the cam being circular from A to A_1 no further movement of the arms takes place.

Characters A, B, C, D, on cam 104 and 104*a* correspond to the same characters on arms 125 and 126, and intend to show the position of the followers along the cam grooves at the various stages of the cycle.

The various positions of arms 125 and 126 as they go through their cycle of operations are identified by A, B, C and D; A indicating the original position, B, the first raised position, C the forward position and D the final folded position.

As will now be clear, folding of the blank is accomplished by a series of movements which place a minimum of strain on the blanks being folded. The folding process in part closely follows through the movements which could be used if the blanks were manually folded; that is, the blank is first raised, turns freely on its scored edge. After

it has gone through substantially 45° angular movement, it is pushed forward through the next angle thus further turning the blank freely about its scored edge.

Thus, it will be noted, the blank is pushed upwardly during the rising portion of its angular movement and pushed forward during the forward portion of its angular movement. This avoids any bending or shifting at the scored edge and results in a perfect folding of the blank along the scored edge.

In order to adjust the cam for different sizes of blanks, the cam mechanism which is suitably supported on frame 119 is slidably mounted on rods 120 secured so as to permit both longitudinal and lateral adjustments. Frame 119 is slidably mounted on rods 120 and can be clamped in any well known manner in position at any desired point along these rods. While frame 119 is thus adjusted with reference to the length of the machine, the cam 104 is free to move along shaft 108, and when frame 119 is locked in position along rods 120, cam 104 is locked in position at a corresponding point along shaft 108.

Cams 104 and 104a are rotated by shaft 108 (Figure 1) which carries at one end a bevel gear 144. Gear 144 meshes with bevel gear 145 which is mounted on shaft 146, which is suitably supported on bearings 147 (Figure 2). On one end of shaft 146 is mounted a pinion 149 which meshes with idler 151. Idler 151 is rigidly connected to sprocket 152 which is connected with sprocket 153 (Figure 10) through continuous chain 154. Sprocket 152 is mounted on pin 160 and sprocket 153 is mounted on shaft 21 which receives its motion in the manner hereinbefore described.

When it is desired to adjust the position of frame 119 with reference to the width of the machine, rods 120 are moved along bars 129 which are secured to the main frame of the machine and clamped at the desired point. At the same time bevel gear 145 is unlocked and is slipped along shaft 146 until its teeth engage those of bevel gear 144 in the new position. Bevel gear 145 is then locked in place to shaft 146 by means of a key running along shaft 146, and the adjustment is complete.

When rod 125 has completed a cycle of operations and is back in its normal position shown in Figure 6, lug 155 (Figure 4) which is attached to continuous chain 156 reaches the top of sprocket 165 (Figures 2 and 3) and engages the rear edge of the blank to propel it along platform 53 and feed it into the space between upper rollers 158 and corresponding lower rollers 159 (Figure 1). Rollers 158 and 159 propel the blank forward and feed it out of the machine in condition to be taped.

In order to prevent the flaps from opening as they enter the rollers, a pair of adjustable guides 162 (Figure 4) are provided consisting of metal plates flared upward at the edge. These guides are clamped to a bar 163 secured between posts 164.

As is shown in Figures 3 and 4, continuous chain 156 connects sprocket 165 to sprocket 166. Sprocket 165 is mounted on shaft 96, (Figure 2) while sprocket 166 is mounted on shaft 167 (Figure 4) which is supported by bearings 168 (Figure 2).

Upper rollers 158 are mounted on shaft 171 (Figures 1 and 2) supported by bearings 172. Secured to shaft 171 is gear 173 which meshes with gear 174. Gear 174 is mounted on shaft 175, on which are also mounted lower rollers 159, and which is supported on bearings 176 (Figure 2). Rigidly secured to gear 174 is sprocket 177 which connects to sprocket 178 through continuous chain 181. Sprocket 178 is secured to shaft 12, whose drive has been described hereinbefore.

As will now be clear, all the mechanisms mentioned above are synchronized in their movements so that the operation of the machine is continuous. At any given moment during the operation there is a blank on each of the three platforms 51, 52 and 53. This operation may be divided into two stages. In each stage three simultaneous movements occur, as shown in Figures 4 and 5 as follows:

When fingers 49 are pushing a blank from platform 51 under gauge 54 and in between upper rollers 71 and lower rollers 72, lugs 92 engage the back of the preceding blank on platform 52 and propel it forward. At the same time, lug 155 is engaging the third blank on the platform 53 which has just been folded and feeding it in between upper rollers 158 and lower rollers 159. When fingers 49 are retreating in the direction of back stop 55 to select the next blank in a supply of blanks stacked on platform 51 resting against hopper 54 with one end on shelf 56, upper rollers 71 and lower rollers 72 are moving the blank previously fed thereunder, across platform 52 while lugs 92 are returning to sprockets 93. At this time, cams 104 and 105 are folding the previously fed blank on platform 53 while lug 155 is returning to sprocket 165 (Figure 2). The previously folded blank is by this time out of the machine and ready for taping.

Although I have described my invention in detail, it will be clear that the illustrations herein given are only by way of example and the invention may take on other forms. Thus, the precise form of drives, including continuous chains and sprockets, the arrangements of the tables, etc., may be modified without departing from my invention and I do not intend to be limited thereby except as set forth in the appended claims.

I claim:

1. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers, an arm for raising and lowering said fingers, said fingers being slidably mounted on said arm to permit reciprocating horizontal movement of said fingers; and a cam mechanism comprising a cam, a connection from said cam to said arm, said cam being shaped to raise and lower said arm through said connection, a second cam, a connection from said second cam to said fingers, said cam reciprocating said finger in a horizontal line through said connection whereby said finger passes through a composite vertical and horizontal movement.

2. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers; and a cam mechanism for operating said folding mechanism in a cycle of operations from its normal position to a predetermined elevation in accordance with the size of the blank flap to be folded, then forward to a predetermined distance, downward to its original elevation to complete the folding operation and returning it to normal position; and an adjusting means for sliding the folding mechanism to provide for folding of long or short and narrow or wide blank flaps.

3. In a machine for folding paper blanks along their scored edges, a folding mechanism com-

prising fingers; and a cam mechanism for operating said folding mechanism in a cycle of operations from its normal position to a predetermined elevation in accordance with the size of the blank flap to be folded, then forward to a predetermined distance, downward to its original elevation to complete the folding operation and returning it to normal position; and means for sliding said folding mechanism along the blanks to be folded to provide for folding any desired length of blank flap.

4. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers; a cam mechanism for operating said folding mechanism in a cycle of operations from its normal position to a predetermined elevation in accordance with the size of the blank flap to be folded, then forward to a predetermined distance, downward to its original elevation to complete the folding operation and returning it to normal position; and means for sliding said folding mechanism away from and towards said blanks for folding narrow or wide blank flaps.

5. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers which in a cycle of operations is first elevated from its normal position to a predetermined elevation in accordance with the size of the blank flap to be folded then moved forward a predetermined distance, then lowered to its original elevation to complete the folding operation and then returned to normal position; a cam mechanism for operating said folding mechanism; means for sliding said folding mechanism along the blanks to be folded to provide for folding any desired length of blank flap; and means for sliding said folding mechanism away from and towards said blanks for folding narrow and wide blank flaps.

6. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers, an arm for raising and lowering said fingers, said fingers being slidably mounted on said arm to permit reciprocating horizontal movement of said fingers; a cam mechanism comprising a cam, a connection from said cam to said arm, said cam being shaped to raise and lower said arm through said connection, a second cam; a connection from said second cam to said fingers, said cam reciprocating said fingers in a horizontal line through said connection whereby said fingers pass through a composite vertical and horizontal movement; and an adjusting means for sliding the folding mechanism to provide for folding of long or short and narrow or wide blank flaps.

7. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers, an arm for raising and lowering said fingers, said fingers being slidably mounted on said arm to permit reciprocating horizontal movement of said fingers; a cam mechanism comprising a cam, a connection from said cam to said arm said cam being shaped to raise and lower said arm through said connection, a second cam; a connection from said second cam to said fingers, said cam reciprocating said fingers in a horizontal line through said connection whereby said fingers pass through a composite vertical and horizontal movement; means for sliding said folding mechanism along the blanks to be folded to provide for folding any length of blank flap; and means for sliding said folding mechanism away from and towards said blanks for folding narrow and wide blank flaps.

8. In a machine for folding paper blanks along their scored edges, a folding mechanism comprising fingers, an arm for raising and lowering said fingers, said fingers being slidably mounted on said arm to permit reciprocating horizontal movement of said fingers; a cam mechanism comprising a cam; a connection from said cam to said arm, said cam being shaped to raise and lower said arm through said connection, a second cam; a connection from said second cam to said fingers, said cam reciprocating said fingers in a horizontal line through said connection whereby said fingers pass through a composite vertical and horizontal movement; means for sliding said folding mechanism along the blanks to be folded to provide for folding any length of blank flap; means for sliding said folding mechanism away from and towards said blanks for folding narrow and wide blank flaps; and a platform having guiding edges for the scored edges of the blanks along which the blanks are to be scored and a central guide for the center of the blank.

9. In a machine for folding paper blanks along their scored edges, a platform; a ledge above said platform for supporting a stack of said blanks above said platform; a reciprocating finger for engaging the lowermost edge of said blank and propelling it off of said ledge on to said platform; a folding mechanism for folding the blank fed from said platform along its scored edge, said folding mechanism comprising fingers, an arm for raising and lowering said fingers, said fingers being slidably mounted on said arm to permit reciprocating horizontal movement of said fingers; and a cam mechanism comprising a cam, a connection from said cam to said arm, said cam being shaped to raise and lower said arm through said connection, a second cam, a connection from said second cam to said fingers, said cam reciprocating said finger in a horizontal line through said connection whereby said finger passes through a composite vertical and horizontal movement.

FRANK PEPPER.