

E. H. TAYLOR.
BOX MAKING MACHINE.
APPLICATION FILED JUNE 9, 1906.

948,298.

Patented Feb. 1, 1910.

3 SHEETS—SHEET 1.

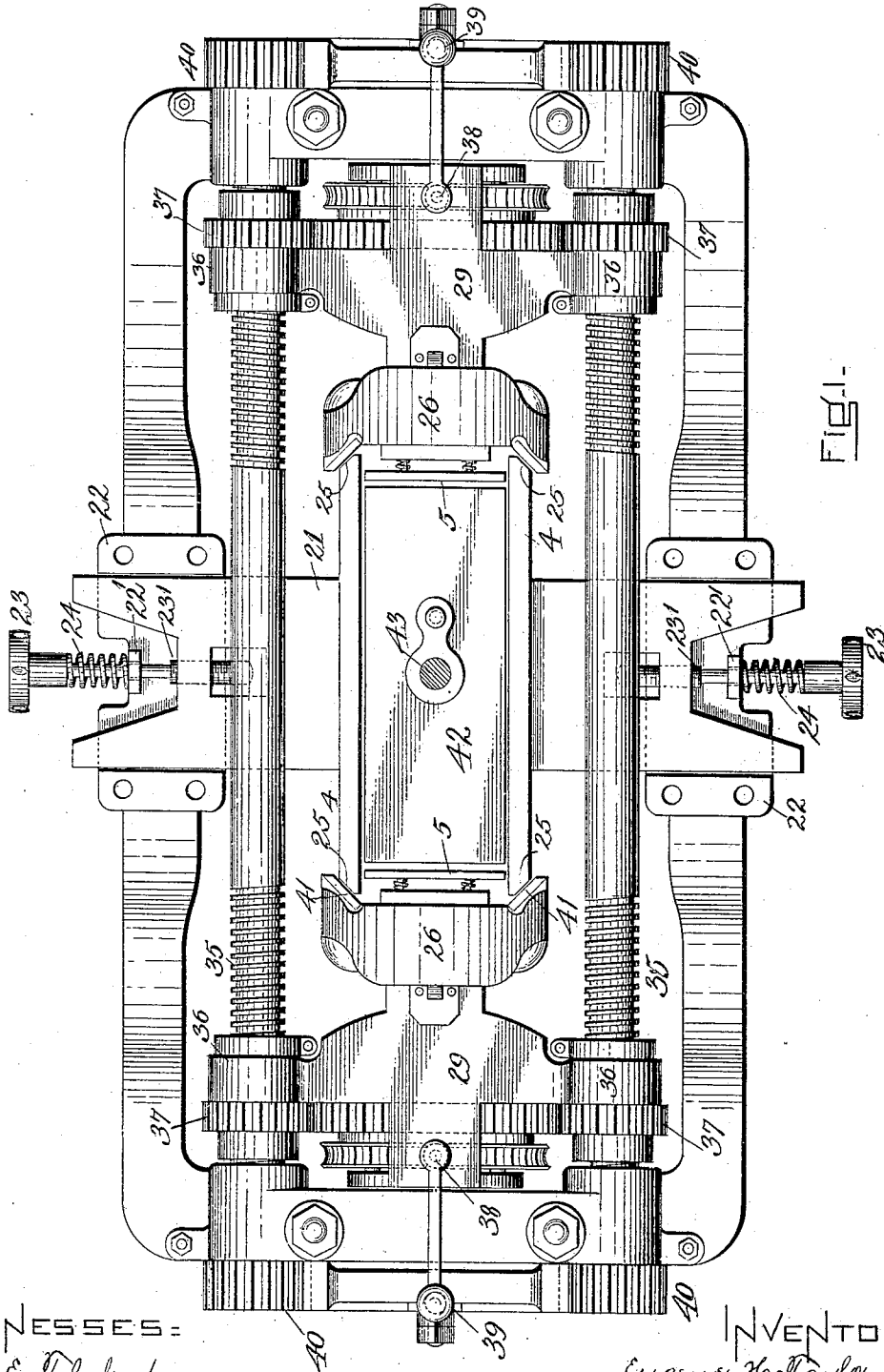


FIG. 1-

WITNESSES:

M. E. Flaherty
M. V. Foley

INVENTOR

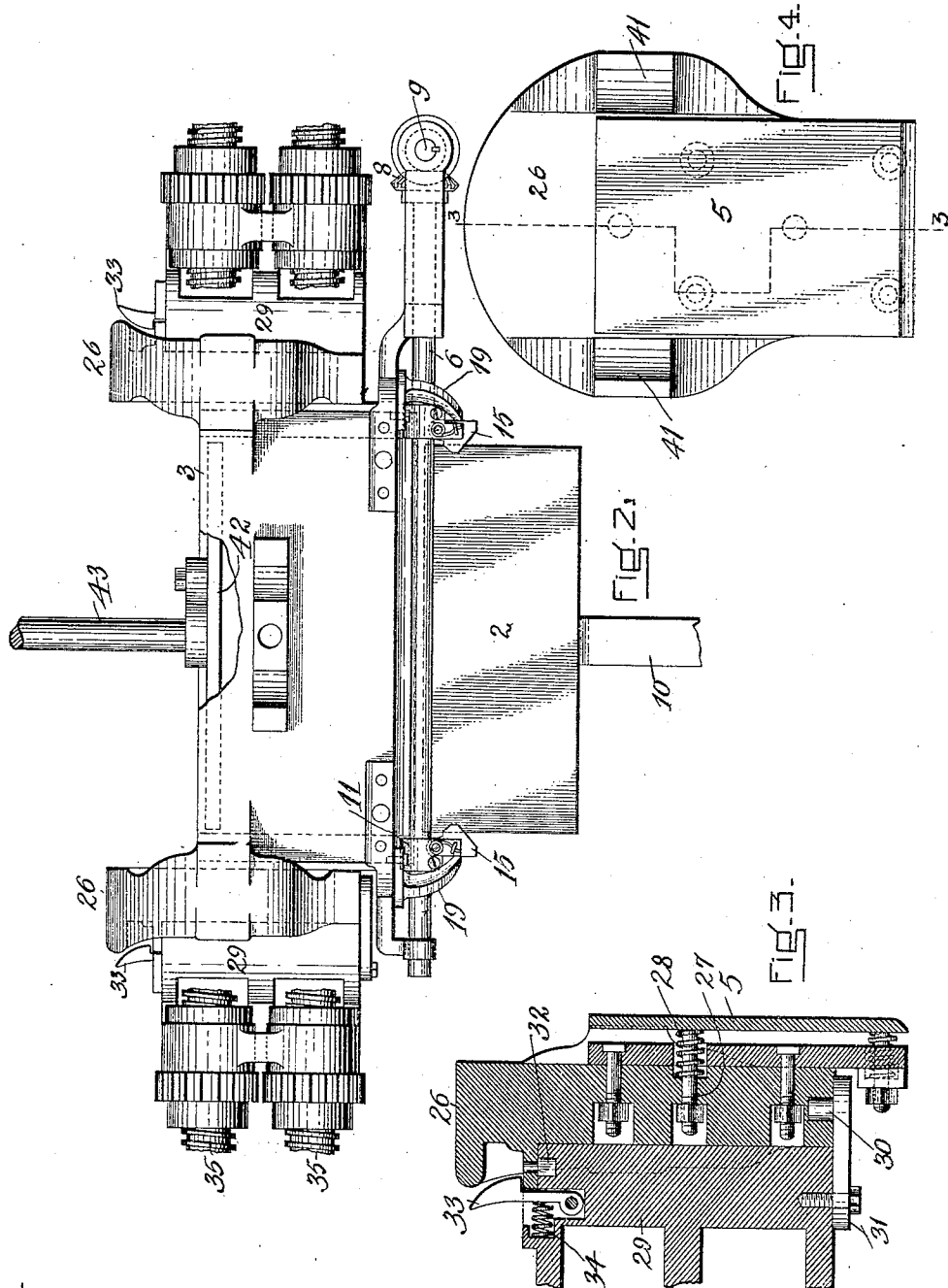
Eugene H. Taylor
By
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his attorneys

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3 SHEETS—SHEET 3.

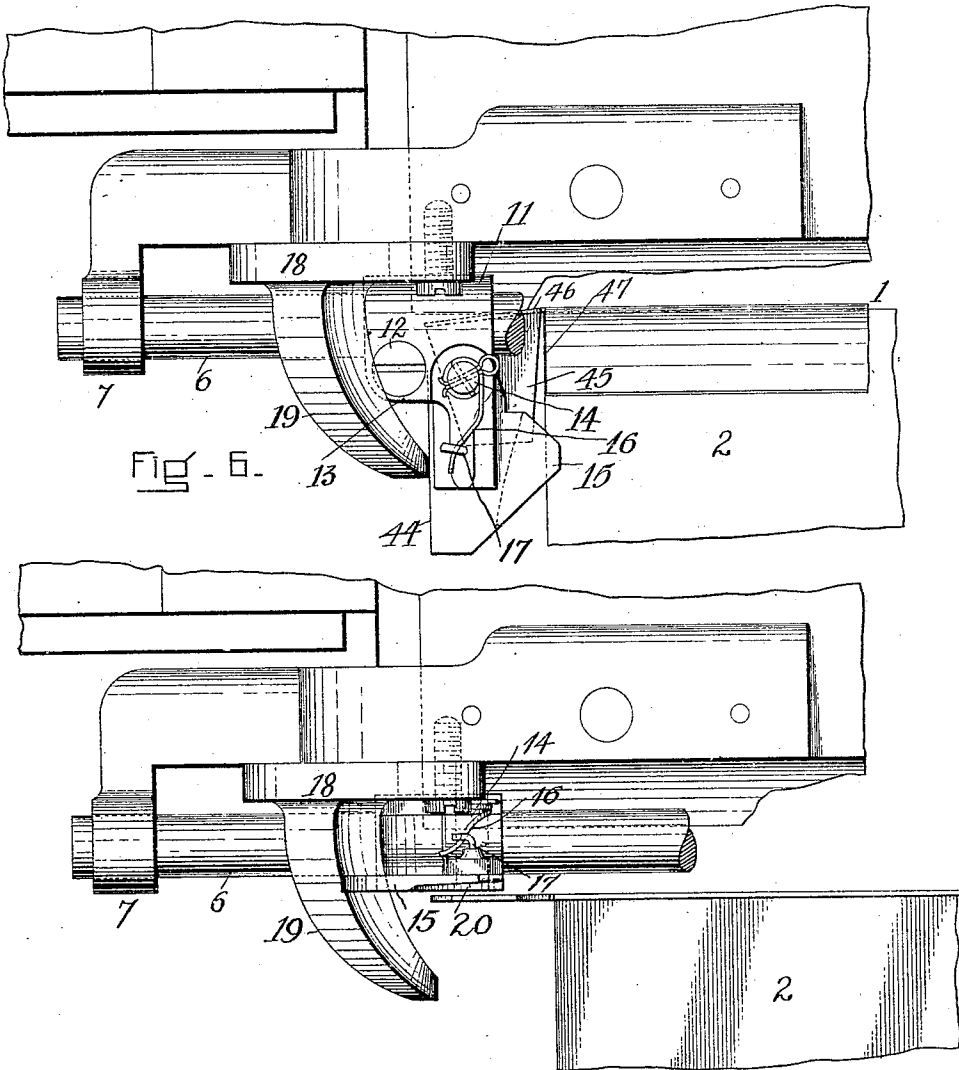


Fig. 5.

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UNITED STATES PATENT OFFICE.

EUGENE H. TAYLOR, OF HYDE PARK, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CUSHMAN PAPER BOX MACHINE COMPANY, A CORPORATION OF MAINE.

BOX-MAKING MACHINE.

948,298.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed June 9, 1906. Serial No. 321,030.

To all whom it may concern:

Be it known that I, EUGENE H. TAYLOR, of Hyde Park, county of Norfolk, State of Massachusetts, a citizen of the United States, have invented new and useful Improvements in Box-Making Machines, and do hereby declare the following to be a full and exact description of my invention.

My present invention relates to certain improvements in mechanism for bending and pressing box blanks after they have been gummed and fed to the forming mechanism.

In some respects my invention more especially relates to that type of box machine in which the box is formed in the act of inserting the blank into the die by means of a former; and particularly relates to improved means, operating in conjunction with the former; to turn the lips of the blank into such a position that, as the edges thereof fold on contact with the plates of the die, the lips carried by one edge will pass under the adjacent edge.

My invention further relates to presser mechanism forming part of, or co-acting with, the die to forcibly and directly compress those portions or edges of the box that have previously been gummed. This feature of my invention is a distinct improvement upon existing machines in which the pressure is so applied as to be indirect and uncertain at the points where needed.

An embodiment of my improved compressing mechanism comprises presser plates for engaging the box and pressers for engaging the presser plates, the plane of action of the pressers being angularly disposed to that of the presser plates, and the contacting surface of pressers and presser plates being beveled or in the form of a cam, whereby the relative movement of the two is differential and permits of the application of great force to the plates at that point.

Other objects of my invention will presently appear upon a detailed description of the same in connection with the drawings in which—

Figure 1 is a top plan view showing die and compressing mechanism; Fig. 2 a side elevation of mechanism shown in Fig. 1, together with the former; Fig. 3 a cross sectional elevation on line 3—3 of Fig. 4, through the end of the die and the compressor; Fig. 4 an inside end elevation of the mechanism shown in Fig. 3; Fig. 5 a

side elevation of the blank turning mechanism in normal position before action, showing the blank in position; Fig. 6 a side elevation of the blank turning mechanism after action, showing the blank ready for insertion into the die.

In the figures I have not shown the feeding, gumming, of other mechanism, as such form no part of my present invention, which relates entirely to the treatment of the blank after it has been fed to the former as shown at 1 in Fig. 5. In this figure and in Figs. 2 and 6, the former head is shown at 2 and is constructed to have a reciprocating up and down movement into and out of the die 3. (See Figs. 1, 2, 5, and 6.) The die is formed by the side plates 4 and the end plates 5, these plates all having a movement and adjustment to be hereinafter described.

Referring particularly to Figs. 5 and 6, the blank 1 is shown in Fig. 5 on the former head 2, preparatory to being acted upon by the turning mechanism. This mechanism consists of an oscillating shaft 6 journaled in brackets 7 secured to the frame of the machine. This shaft is connected through bevel gears 8 with the shaft 9, in turn connected with the driving mechanism. (See Fig. 2.) Also in connection with the driving mechanism is the supporting rod 10 of the head 2. Mounted upon the shaft 6 is a collar 11 rigidly secured thereto by means of screws 12 passing through the ears 13 of the collar. Pivottally mounted upon the collar 11 by means of the pivot pin 14 is the end and lip turning piece 15. This piece is adapted to swing in a plane parallel to the shaft 6, but is normally held in the position shown in Fig. 5 by means of the spring 16. One end of this spring is made fast to a projection 17 of the collar 11 while the other end is attached to the pivot of the piece 15 and tends to turn the same to the left. Bolted to the bracket 7 is the plate 18 carrying the cam piece 19. The piece 15 is provided with a cut 20 (see Fig. 5) to better engage the lip of the blank, as will presently appear.

Referring now to Fig. 1, the side plates 4 are shown mounted upon the slides 21 movable in the ways 22. Slidably mounted in lugs 22¹ of the frame of the machine, and having threaded connections with the slides 21, are the bolts 23. Springs 24 engage the bolts 23, and the lugs 22¹, and tend to force

the bolts, together with the slides and plates. outward, and this outward movement is limited by the shoulders 23¹ of the bolts engaging the lugs 22¹. The plates 4 are beveled as shown at 25. The end plates 5 are shown (see Figs. 1 and 3) as yieldingly mounted upon the compressor pieces 26 by means of the bolts 27 and coil springs 28. These compressor pieces are removably mounted upon the compressing mechanism frame 29 by means of the dowel 30 on the plate 31 secured to the frame 29, and the pin 32 (see Fig. 3). The latch 33 held normally in the position shown in Fig. 3 by the spring 34 serves to lock the compressing piece in place. The compressor actuating and adjusting mechanism is old and is described in former patents of mine and consists briefly of a frame 29 mounted upon screw shafts 35, and adjustable thereon by means of a thread sleeve 36, revoluble thereon by means of pinions 37 geared to hand shaft 38, and operated by handle 39. The screw shafts 35 are actuated by means of pinions 40 mounted thereon and in gear with the driving mechanism. The compressor pieces 26 are provided with the bevel faces 41 located to engage the bevel faces 25 and the side pieces 4, to operate said side pieces as will hereinafter appear. At 42 is shown the follower with follower shaft 43.

The operation of my machine is as follows: The blank 1 having been fed to the former head as shown in Fig. 5, the shaft 6 commences to turn and simultaneously, the former head to rise. As the shaft 6 turns carrying with it the piece 15, the cam 19 engages with the face 44 of the piece 15 and operates to swing the same upon its pivot 14. The action of the piece 15 in turning with the shaft 6 is first, by engagement with the cam 19, to swing across the face of the lip 45 of the blank preparatory to engaging the same upon further rotation of the shaft 6, and second, upon such further rotation, to actually engage the lip, and in conjunction with the former plate, to turn the same down and into somewhat the position shown in Fig. 6. The continued engagement of the piece 15 with the cam 19 will then cause it to engage the edge of the lip 47 of the blank and assist in turning the same. This operation is facilitated by the cut 20 forming a beveled surface on the piece 15. In the meanwhile the advance of the former head has brought the blank into contact with the die plates 4 and 5, and in Fig. 6 the edges 46 and 47 of the blank are shown as having commenced to yield at the contact. The former head now continuing to advance, and acting in coöperation with the die plates, causes the edge 46 to fold down, and carry the lip 45 under the edge 47, and the edge 47 to fold over the lip. The springs 28 of

the plates 5 are sufficiently rigid to prevent undue yielding of the plates on contact with the blank until pressure is applied to the die. Upon the arrival of the former head and follower at the end of their stroke the compressing pieces 26 are advanced to engage the plates 4. The engagement occurs along the beveled faces 25 and 41 and causes the plates 4 to be forced inward and against the sides of the box, the pressure of the plates 4 upon the box being in the immediate neighborhood of the beveled contacting surfaces. It is at this point that the gummed edges of the box are found and accordingly it is here that pressure is particularly desired and more pressure is secured because at this point there is a double thickness of stock caused by the folding in of the lips. The action of the pieces 26 and the plates 4 being differential any desired pressure may be readily obtained.

Whereas I have shown the compressor pieces and plates as both beveled, it is obvious that this need not necessarily be the case, as the beveling of either one alone may in some instances be sufficient. The advance of the presser pieces is not impeded by the end plates 5 because of the yielding mount of the latter, before described.

As shown in Fig. 3, my compressor pieces may be readily attached to or removed from the pieces 29 in any machine already constructed or to be constructed, and when removed such pieces 29 may be adapted to act as end compressors without the piece 26 as exemplified in any of the well known machines of this general type.

What I claim as my invention is:—

1. In a box making machine, the combination of a former, and a die or mold comprising four presser plates, two adapted to compress the side of the folded box blank and two the ends thereof, two opposing plates having a cam or bevel surface, and two opposing plates being adapted to yield to conform to the thickness of the blanks being compressed, and means to engage the said cam surfaces to move the same substantially as and for the purposes set forth.

2. In a box making machine, the combination of a former, and a die or mold comprising two opposing presser plates having beveled edges and adapted to press a blank against said former, and means having a movement to engage the plates along said bevel and carrying other yielding presser plates adapted to engage other portions of said blank as described.

3. In a box making machine, the combination of a former and a die or mold comprising presser plates located in pairs opposite each other, said presser plates moving in different planes and one pair of presser plates carrying plates yieldingly mounted there-

on and having cam or beveled surfaces at their place of contact with the other presser plates, as described.

4. In a box making machine, the combination of a former and a die or mold, comprising presser plates having an outside bevel at their edges, and presser pieces having bevel surfaces and having a movement to cause such surfaces to engage the bevel surfaces of the presser plates to actuate the latter, said presser pieces carrying yielding plates, substantially as described.

5. In combination, in a die or mold, oppositely disposed side or end presser plates having beveled edges, oppositely disposed presser pieces having beveled surfaces, end or side plates yieldingly mounted upon said presser pieces, said presser pieces having a movement to engage at their bevel surfaces the bevel edges of the side or end presser plates to actuate the latter.

6. In combination in a die or mold, presser plates, a presser piece having yieldingly mounted thereon a die plate, and having means for engaging the presser plates.

7. In combination in a die or mold, a presser plate mounted to slide on the frame of the machine, a spring for returning said plate to a normal position, the plate having beveled edges for engaging means to move it forward against the action of the spring and said moving means.

8. Lip folding mechanism as described, comprising a rotary shaft, a lip bending device mounted to rotate with the shaft, said device being also mounted to swing across its plane of rotation, and a cam or guiding piece to contact with said bending device and upon rotation of the shaft to swing the same.

9. Lip folding mechanism as described, comprising a rotary shaft, a lip bending device mounted to rotate with the shaft, said device being also mounted to swing across its plane of rotation, and a cam or guiding piece to contact with said bending device

and upon rotation of the shaft to swing the same, and a spring to return the bending device to its normal position.

10. Lip folding mechanism as described, comprising a rotary shaft, a lip bending device mounted to rotate with the shaft, said device being also mounted to swing across its plane of rotation, and a rigid cam or guiding piece to contact with said bending device and upon rotation of the shaft to swing the same.

11. Lip folding mechanism as described, comprising a rotary shaft, a lip bending device pivotally mounted upon said shaft, and a cam or guiding piece to co-act with the device to swing it upon rotation of the shaft.

12. A former head, having a reciprocating movement to carry a blank, a rotary shaft, a collar fast thereon, a bending piece pivotally mounted upon the collar to be swung downward by said shaft into contact with the lip of the blank, and stationary means co-acting with the bending piece to swing the same inward with the lip upon movement of the rotary shaft.

13. Lip folding mechanism as described, comprising a lip bending device in a plurality of sections, one section being pivotally mounted on the machine frame, and another section pivotally attached to first section to have a movement with said first section and also to have a movement transverse thereto, and stationary means co-acting with said second section to move it transversely upon movement of the first section.

14. Lip folding mechanism as described, comprising a lip bending device pivotally mounted to have a double movement, mechanism to give the device one movement and stationary means to thereupon co-act with the device to give it another movement.

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Witnesses:

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M. E. FLAHERTY.