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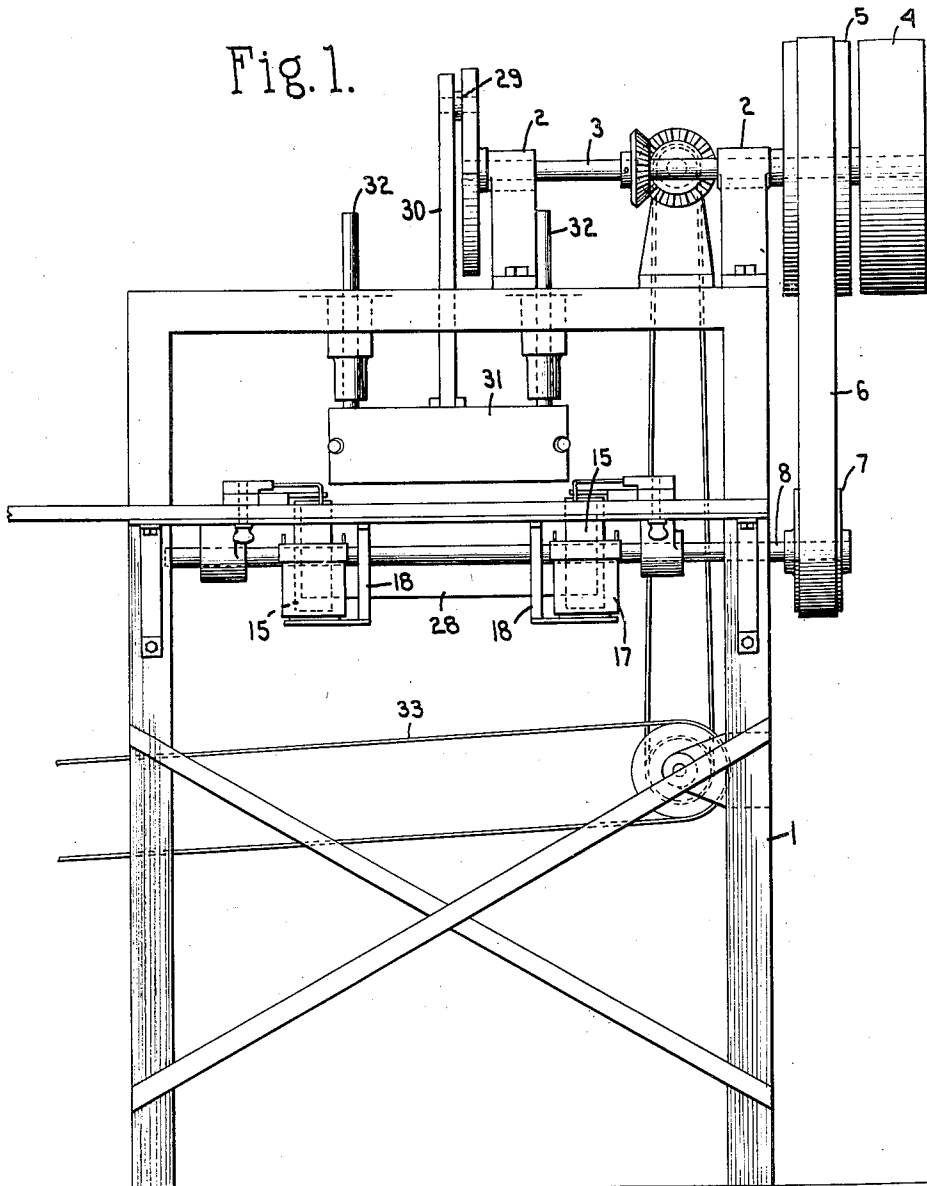
1,476,954

H. A. DENMIRE

BOX MAKING MACHINE

Filed Jan. 16. 1922

4 Sheets-Sheet 1



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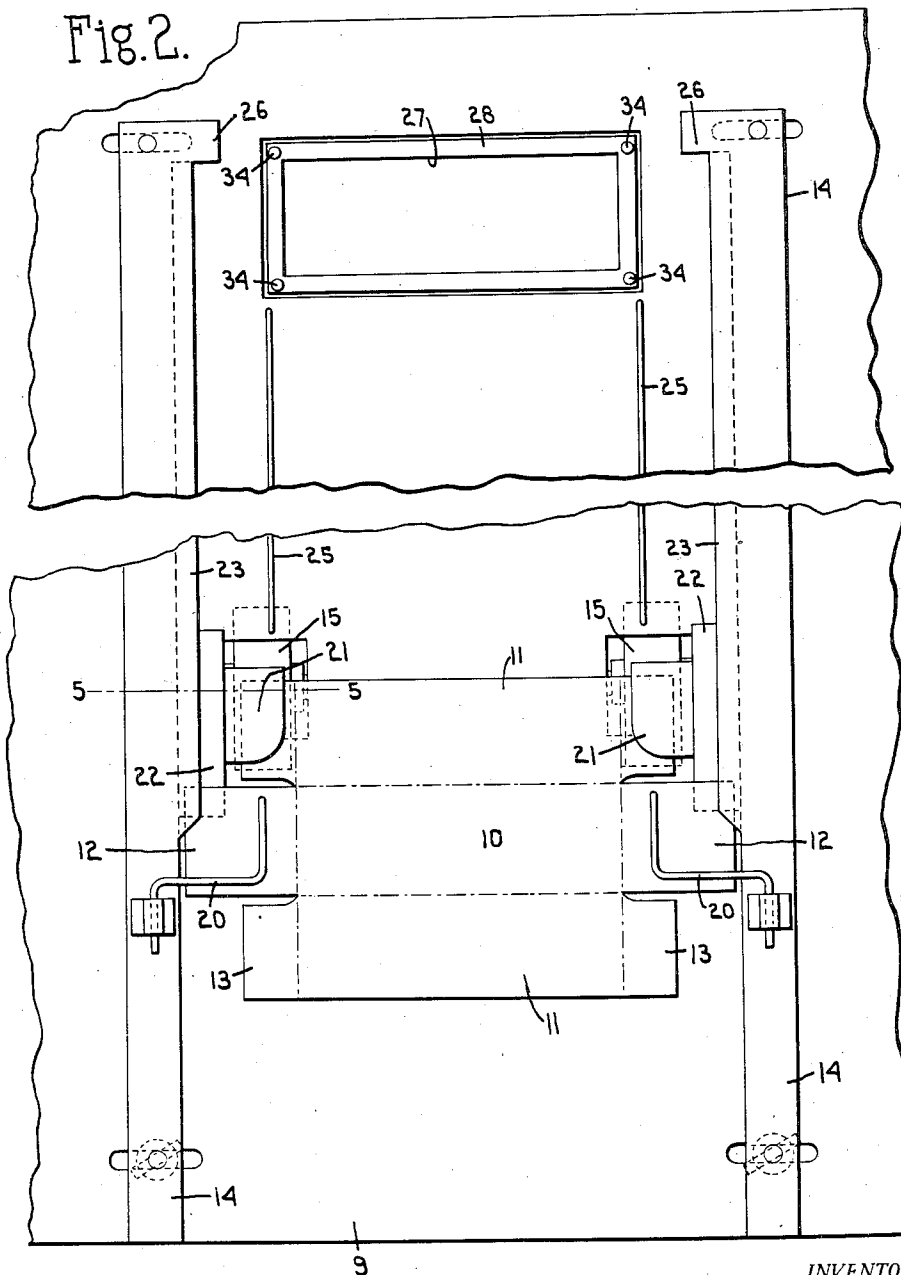
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Fig. 2.



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Fig. 3.

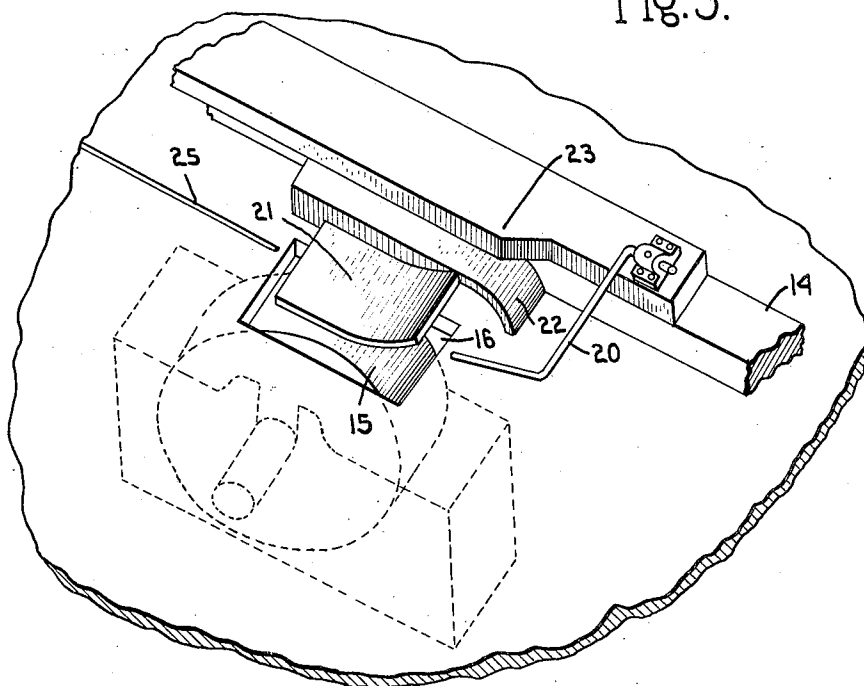
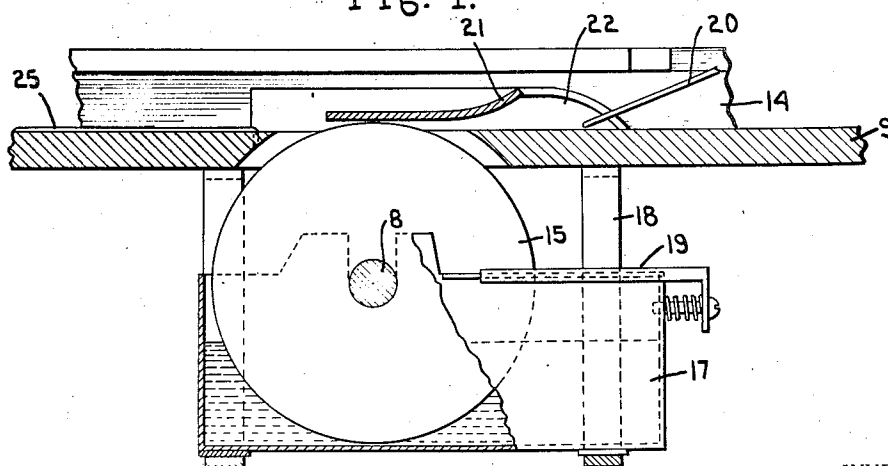


Fig. 4.



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Fig. 9.

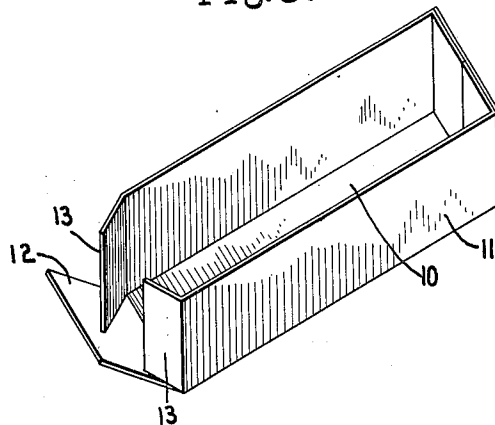


Fig. 6.

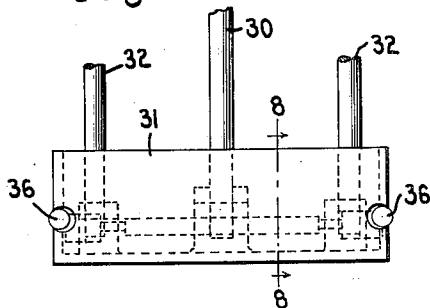


Fig. 8.

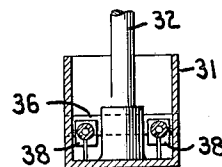


Fig. 7.

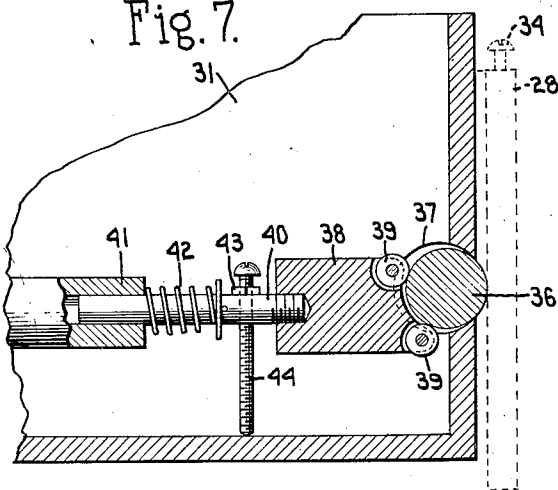
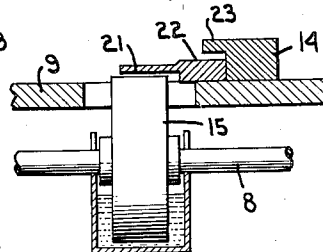


Fig. 5.



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UNITED STATES PATENT OFFICE.

HAROLD A. DENMIRE, OF AKRON, OHIO, ASSIGNOR TO THE GENERAL TIRE AND RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

BOX-MAKING MACHINE.

Application filed January 16, 1922. Serial No. 529,407.

To all whom it may concern:

Be it known that I, HAROLD A. DENMIRE, a citizen of the United States, residing at Akron, in the county of Summit, State of Ohio, have invented certain new and useful Improvements in Box-Making Machines, of which the following is a specification.

This invention relates to a machine for folding box blanks or similar articles and gluing or sticking them together during the folding operation.

This invention relates to a type of machine such as shown in my prior Patent #1,391,639 dated Sept. 27, 1921, the object of the present invention being to simplify and improve upon certain features of my prior machine.

My present invention embodies an improved device for gluing the box ends which does away with certain objectionable features of the prior machine. The form of plunger is improved and the means for insuring the proper sequence of the folding of the box ends has been simplified. These and other objects are attained in the machine shown herein.

It will be understood that the particular form of the machine or the arrangement of parts is not essential, but may be varied or altered, the drawing and description being such as to enable one skilled in the art to practise the invention, and it will be understood that the showing is only one form of the invention, others being possible.

In the drawings:

Fig. 1 is a front view of the machine of my invention.

Fig. 2 is a plan view with the driving portion removed.

Fig. 3 is a perspective view of one of the glue applying devices.

Fig. 4 is a vertical section of the same.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is a side view of the plunger.

Fig. 7 is a section through one end.

Fig. 8 is a section on the line 8—8 of Fig. 6.

Fig. 9 is a perspective view of the box.

The machine comprises a framework 1 on the top of which are mounted brackets 2 supporting the drive shaft 3, having a drive pulley 4 and a second pulley 5 over which runs a belt 6 to a pulley 7. The pulley 7

drives a secondary shaft 8 located in bearings below the bed plate 9, of the machine.

The box blank, which this machine is designed to form into a box is shown in Fig. 2 and comprises a base or body portion 10, two side flaps 11 and two end flaps 12. On the side flaps are formed two end tabs or wings 13, which when the box is folded as shown in Fig. 9, meet to form the ends of the box, being reinforced by the end flaps 12. To apply the necessary glue to the contacting surfaces of the flaps 12 and the wings 13, it should be applied to one of said parts so as to stick to the other when the box is folded. In my former machine the glue was applied to the end flap, in this machine, however, the glue is applied to the undersurface of the end tabs 13.

The box blank is laid on the bed plate 9 between the two adjustable side rails 14, which extend along the machine. These rails are set to the proper width for the box which is being folded and guide the box blank through the machine. At suitable points the shaft 8 is provided with two rollers 15 which project upwardly through slots 16 in the bed plate in such position that they will strike the wings 13 of any usual size box. The rollers dip into glue pots 17 suspended from the underside of the bed plate by hangers 18, the pots being provided with adjustable doctors or scrapers 19 to regulate the quantity of glue delivered by the rolls.

As the rolls are constantly rotated by the shaft 8 they serve to supply sufficient glue for the boxes at all times. It will be seen that it is necessary to apply the glue to the underside of the end tabs or wings 13 only and not to the underside of the end flaps 12, which would be on the outside of the finished box.

To accomplish the results desired, the end rails 14 carry fingers 20, which are preferably of spring wire and these fingers bear on all of the flaps of the blank. The end of the finger 20 is near the opening 16 and over the roll 15 is arranged a curved guide 21, the lower surface of which just clears the glue roller, operating to press the end tabs in contact with the roller. Between the guide 21 and the end rail 14 is located an upwardly curved track or rail 22 which is so positioned as to clear the ends of the tabs but to contact the longer end flaps 12

and lift them over the guide 21 so that they do not become coated with glue. The rail 14 is provided with an overhanging ledge 23 which prevents the end flaps from bending up.

It will be seen that by the mechanism described there is provided a simple and efficient device by which glue is applied to the underside of the end tabs, of the box, but not to the end flaps so that when the box is folded the glue is in the proper position.

As the box blanks leaves the gluing device they pass over the bed plate, the sticky end tabs being supported on wires 25 or similar means so as not to smear glue over the top of the plate.

The operator pushes the box blank forward until the end flaps strike projections 26 at the ends of the rails 14 at which time the blank is positioned with the bottoms 10 in line with an opening 27 formed in a removable die 28, seated in the bed plate. The die is removable so that a different size die may be inserted in the machine for a different size of box.

The shaft 3, which is constantly rotated, is provided with a crank 29 connected by a link 30 with a plunger 31 which is slightly smaller than the die opening, and is guided by pins 32 so that as the crank rotates the plunger will enter the die, pushing a blank down into it which action serves to fold the flaps and end tabs in a manner to be described. The plunger pushes the blanks out of the die and on to a moving conveyor belt 33 driven from the main shaft 2 in any suitable manner.

It will be noted that the overhanging ledge 23 continues to the end of the side rails and it will also be noted that in the four corners of the die are located screws or pins 34, which project above the top of the die in such position as to contact the end tabs and raise them above the end flaps. Now, as the plunger descends, it strikes the bottom 10 of the blank and pushes it into the opening of the die. As the end flaps are held down by the overhanging ledge 23, the side flaps will bend first and the pins 34 will insure the end tabs passing within the end flaps. As the box goes down into the die opening, the flaps 12 will follow and the flaps and tabs will be folded together obtaining adhesion through the glue on the outside of the tabs 13.

The ends of the plunger are constructed so as to provide a rolling pressure on the box ends which insures a better adhesion and is more efficient than a solid plunger. This result is obtained by two rollers 36, which are mounted to rotate in recesses 37 across the ends of the plunger. Each roller is supported by means of two blocks 38 which carry small rollers 39 that act as

cradles for the roll 36. The blocks 38 are supported on pins 40, which pins are slidably mounted in tubes 41 on the body of the plunger, the pins being pressed forwardly by springs 42 restrained by washers 43. A long screw 44 is secured in each pin 40 and extends downwardly to contact with the bottom surface of the plunger. This set screw is provided to limit the downward movement of the pins 40 when the plunger rises, thus preventing jamming of the plunger on the upward travel.

It will be seen that the machine here shown is simple and effective in its operation. The box blank is glued at the proper points and the folding operation is done with a single stroke of the plunger which also serves to roll the ends into firm adhesion.

Changes and modifications may be made and alterations in proportions or relationship of the parts may be made without sacrificing any of the benefits of the invention or departing from the scope of the appended claims.

I claim:

1. In a machine for making boxes from blanks having lateral extensions, a glue roller, means to bring certain of said extensions in contact with the roller and means to remove the other extensions from said roller.

2. In a machine for making boxes from blanks having lateral extensions, a glue roller, a guide for certain of said extensions to bring them in contact with the roller, and a rail over which the other extensions travel out of contact with the glue roller.

3. In a machine for making boxes from blanks having lateral extensions of different lengths, a gluing device, means for conducting the shorter extensions in contact with the gluing device, and means for conducting the longer extensions away from the said device.

4. In a machine for making boxes from blanks having lateral extensions, a gluing device, means to conduct certain of said extensions to have glue applied thereon and means to remove the other extensions from said device.

5. In a machine for making boxes from blanks having lateral extensions, a folding device and a gluing device, means for guiding blanks through the gluing device to the folding device, and means to pass certain of said lateral extensions by the gluing device without receiving glue therefrom.

6. In a machine for gluing box blanks, having lateral extensions of different lengths, a glue roller, a guide for conducting the shorter extensions in contact with the glue roller and a rail for lifting the longer extensions out of contact with the glue roller.

7. A machine for making boxes, comprising a plunger, and a die, rollers in the ends of the plunger and means for yieldingly supporting the rollers.

5 8. A machine for making boxes comprising a plunger, and a die, the ends of the plunger being provided with recesses, rollers mounted for rotation in the recesses and means for pressing the rollers outwardly
10 with yielding pressure.

9. A machine for making boxes, comprising a plunger, and a die, the ends of the

plunger being provided with recesses, floating rollers in said recesses and spring held cradles for supporting the rollers.

10. A machine for making boxes, comprising a plunger and a die, the ends of the plunger being provided with recesses, floating rollers in said recesses, cradles for supporting the rollers and spring actuated rods
20 for pressing the cradles outwardly of the plunger.

HAROLD A. DENMIRE.