No. 713,766. Patented Nov. 18, 1902.

F. E. JAGENBERG.

MACHINE FOR MAKING BOXES.

(Application filed Feb. 12, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

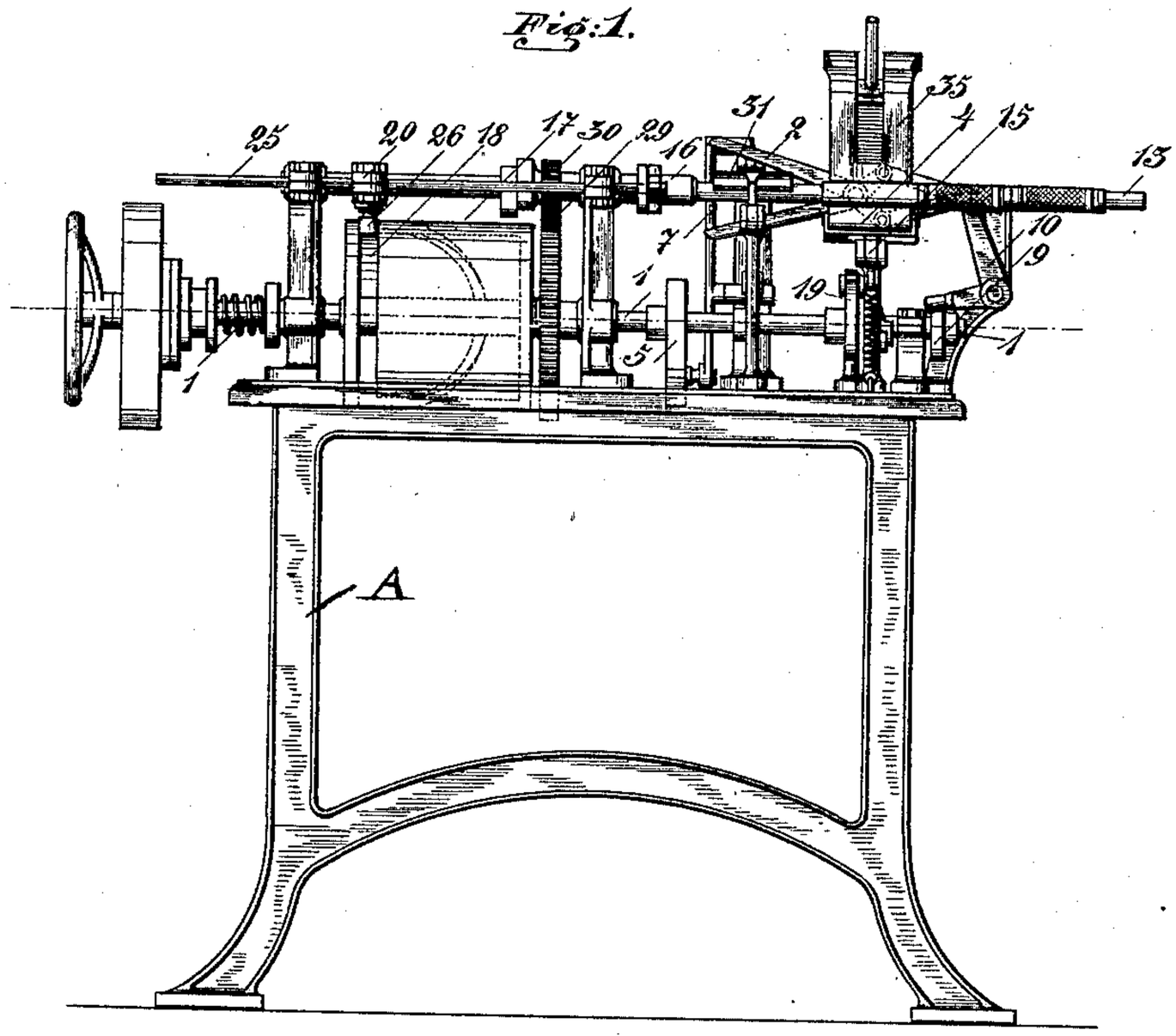
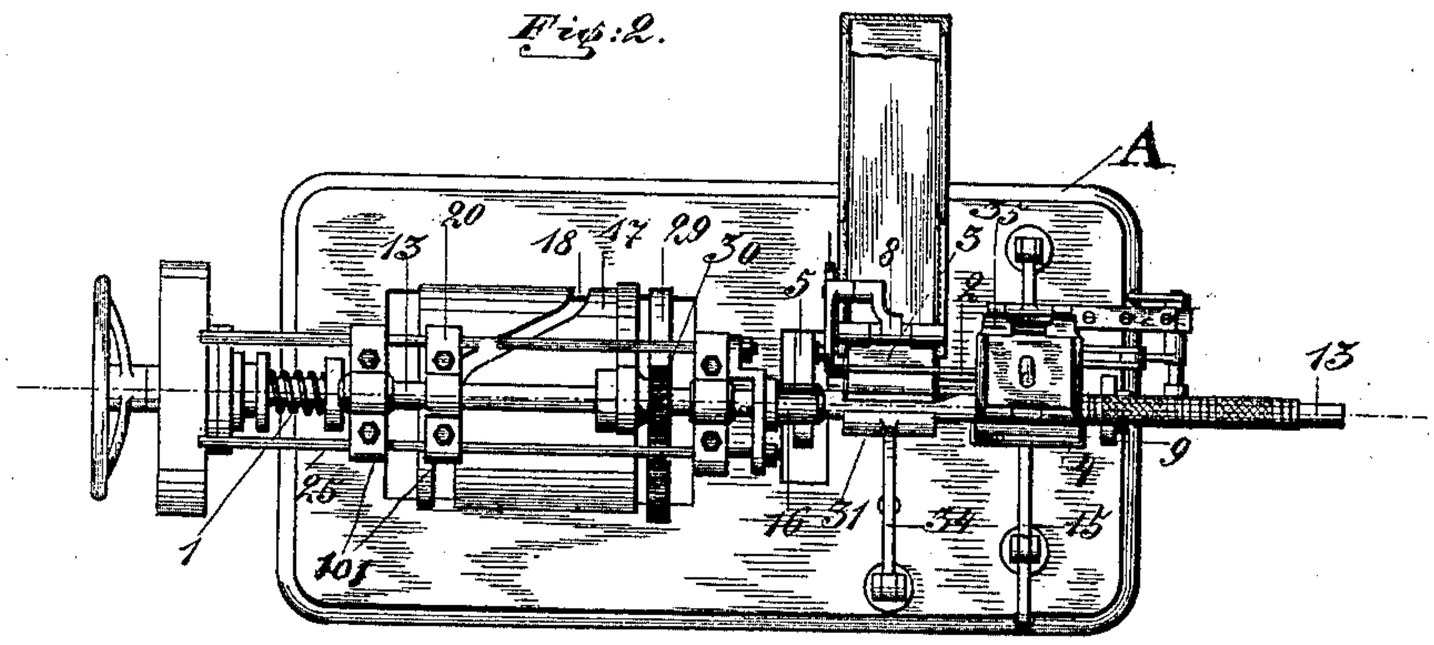


Fig. 2.



Witnesses:
Edward Ray
William Schulz.

Inventor
Ferd Emil Jagenberg.
by his attorneys
Roeder & Briesen

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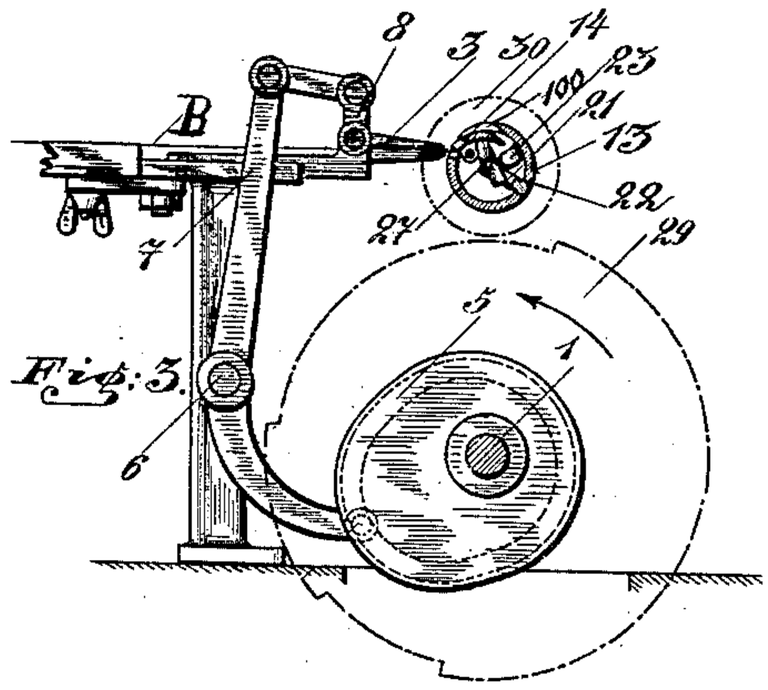

Fig: 3.

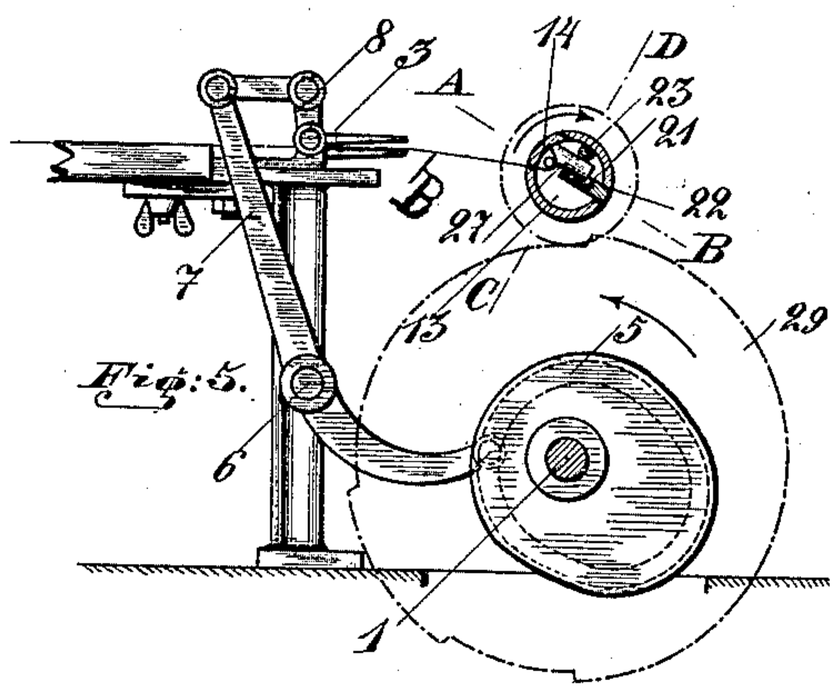

Fig: 5.

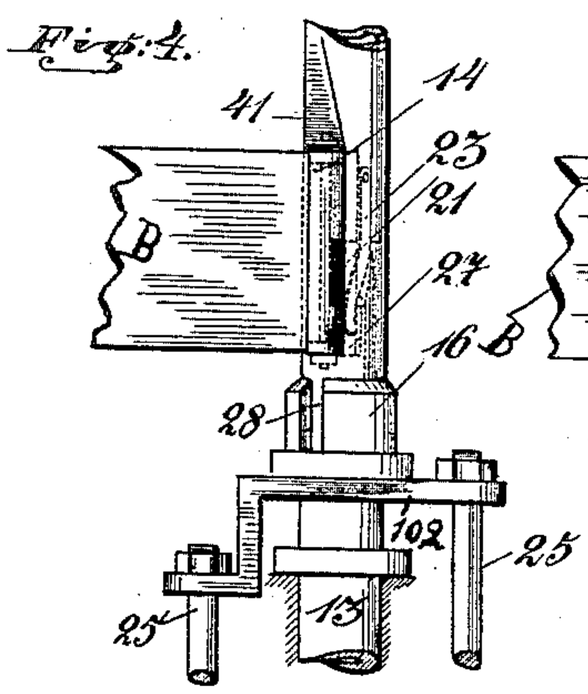

Fig: 4.

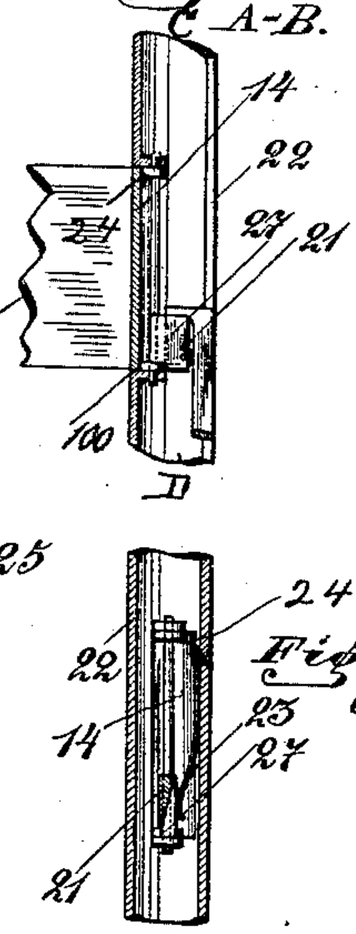

Fig: 7, C A-B.

Fig: 8, C-D.

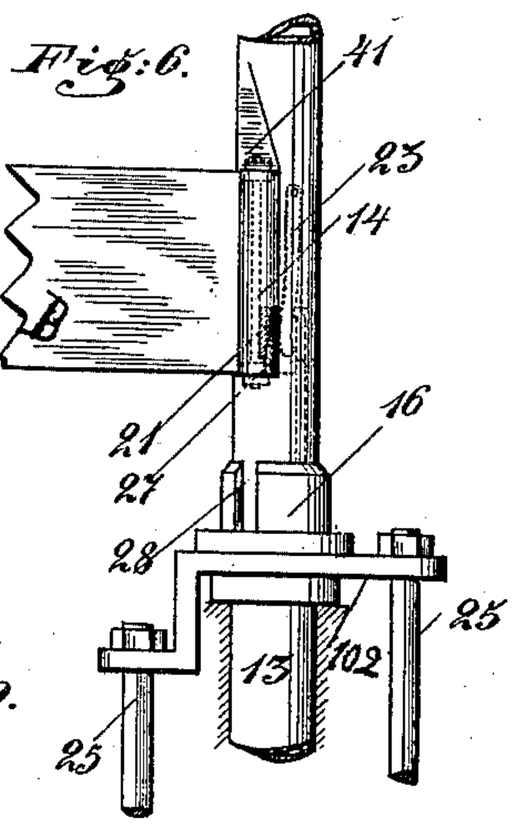

Fig: 6.

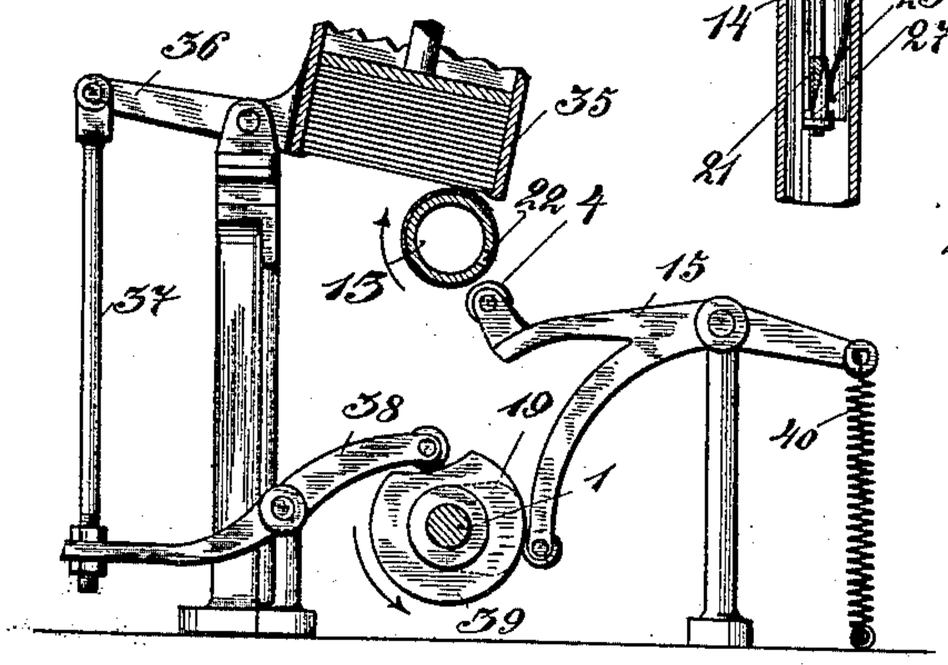

Fig: 10.

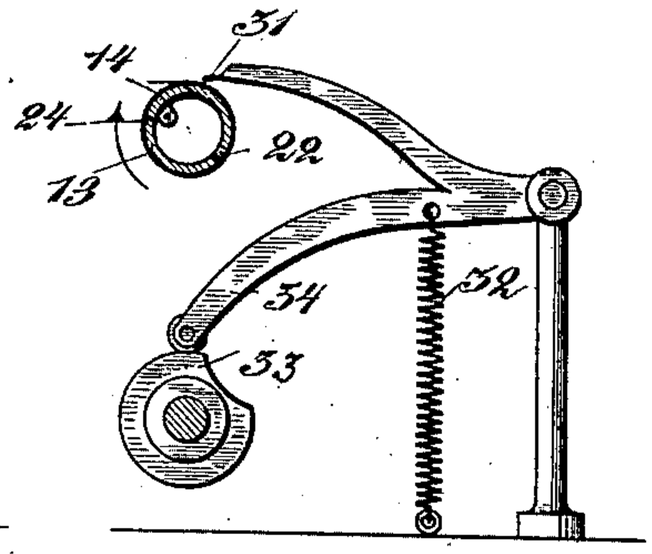

Fig: 9.

Witnesses:
Edward Ray.
William Schulz.

Inventor.
Ferd. Emil Jagenberg
by his attorneys
Roeder & Briesen.

UNITED STATES PATENT OFFICE.

FERD EMIL JAGENBERG, OF DUSSELDORF, GERMANY.

MACHINE FOR MAKING BOXES.

SPECIFICATION forming part of Letters Patent No. 713,766, dated November 18, 1902.

Application filed February 12, 1902. Serial No. 93,689. (No model.)

To all whom it may concern:

Be it known that I, FERD EMIL JAGENBERG, a citizen of Germany, and a resident of Dusseldorf, Germany, have invented certain new and useful Improvements in Machines for Making Paper Boxes, of which the following is a specification.

This invention relates to a machine for making the body portion or sides of paper boxes and attaching the labels to the boxes.

In the accompanying drawings, Figure 1 is a front elevation of my improved machine; Fig. 2, a top view of the same. Figs. 3 and 5 are details of the catch and of the paper-rolling mechanism. Figs. 4, 6, 7, and 8 are details of the paper-holding finger. Fig. 9 is a detail of the paper-press, and Fig. 10 a detail of the label-attaching mechanism.

The frame A of the machine carries in suitable bearings a main shaft 1, which may be driven either by a belt or by an electromotor. In order to insure an instantaneous stopping of the machine, the shaft 1 is furnished with a suitable clutch. The shaft 1 imparts intermittent rotation to a tubular mandrel or core 13 by means of a mutilated toothed wheel 29, engaging a toothed wheel 30. The mandrel 13 has a slot 100, adapted to receive the end of a paper strip B, coated with an adhesive and from which the body of the box is formed, as hereinafter described.

The paper strip B is seized by a gripper 3, operated from cam 5, mounted on shaft 1. The cam 5 is engaged by a double lever 7, pivoted at 6 and engaging a bent lever 8, which is firmly attached to the upper oscillating jaw of gripper 3. The gripper is adapted to slide in a groove of frame A and has a sliding as well as an opening and closing motion. When the lever 7 swings with its upper end to the right, Fig. 5, it first closes the gripper and then moves the closed gripper forward or toward the mandrel 13, Fig. 3. A further rotation of shaft 1 will cause the lever 7 to move to the left to first open the gripper and to then move the slide and gripper backward or away from the mandrel 13.

Within the slot 100 of mandrel 13 is arranged an oscillating finger 14, turning in bearings 24 and pressed inwardly by a spring 23, so that the slot 100 is opened and the end of the strip B can be introduced into the hollow of the mandrel by the gripper 3.

A sliding collar 16, which embraces mandrel 13, is reciprocated, by means of a cam 17 on shaft 1, in the following manner: In the groove 18 of cam 17 moves a roller 26, attached to a cross-head 20. This cross-head carries guide-rods 25, which are longitudinally movable in guides 101 and are connected at their forward ends to a cross-piece 102, to which in turn the collar 16 is secured. The collar 16 has a longitudinal slot 28 and a tapering pin or finger 21, that passes through a slot 22 into the interior of mandrel 13. This finger during its backward movement bears against a shoulder 27 of the finger 14 and presses the finger outward against the action of spring 23, thus tightly clamping the strip B between the mandrel 13 and the finger 14, so that the winding of strip B can be commenced, Figs. 3 to 8. After the strip has been thus secured the mandrel 13 is rotated by means of wheels 29 and 30 until a sufficient number of spiral layers have been wound upon the mandrel to give to the body of the box the necessary thickness and strength.

In order to sever the wound portion of the strip, I employ a pair of shears 2, Fig. 1, actuated by a lever 10 from cam 9 on shaft 1. The outer end of the coiled strip B is pressed against the underlying layer of paper by a pressure-bar 31, Fig. 9, secured to an arm of a double lever 34, the other arm of which engages a cam 33. When the cam-roller of lever 34 engages the receding section of cam 33, the lever 34 is drawn down by a spring 32 to press the plate 31 against the paper coil, while when the cam-roller engages the full section of the cam the plate 31 is raised off the paper coil against the action of spring 32.

In order to attach a label to the finished paper box, I provide a movable label-magazine 35 above mandrel 13. This magazine is attached to a lever 36, which is in turn connected with a double lever 38 by a connecting-rod 37. The other arm of lever 38 carries a cam-roller which engages cam 39. When the cam-roller engages the receding section of cam 39, the label-magazine will be lowered by its own weight until the lowermost label touches the coated surface of the paper

body. In order to press the label during the rotation of the box against the latter, I provide a roller 4, attached to one arm of a lever 15, the second arm of which carries a cam-roller. This cam-roller engages a cam 19 on shaft 1. The roller 4 is pressed upward by a spring 40.

The slot 100 of mandrel 13 terminates in a notch or slope 41, which gradually merges into the surface of the mandrel 13. When the finished box is moved along the mandrel to arrive under the label-magazine, the inner end of the strip B can leave the slot 100 without difficulty, moving over the inclined surface of slope 41 and folding firmly against the inner side of the box, to which it adheres.

The operation is as follows: The glued paper strip B first passes between the opened jaws of gripper 3. The rotation of shaft 1 causes by cam 5 the upper end of lever 7 to move to the right in order to close the gripper, and then the gripper, with the strip, moves farther until the end of the strip projecting out of the gripper arrives in the opened slot 100 of mandrel 13. The collar 16 is then slid along the mandrel 13 toward the left by cam 17, cross-head 20, guide-rods 25, and cross-piece 102 until the tapering finger 21 bears against shoulder 27 of finger 14, thus closing the finger and tightly jamming the strip B against the mandrel. After the end of the strip B is thus fastened the mandrel 13 begins to rotate by means of toothed wheels 29 and 30, and the strip B is wound repeatedly around the mandrel until the body of the box has acquired the necessary thickness and strength, when the teeth of wheels 29 and 30 become disengaged to stop a further rotation of the mandrel. The shears 2 will now close by cam 9 and lever 10 to sever strip B from the coil. In order to glue the free end of the strip to the underlying layer, the spring 32 causes the pressure-bar 31 to descend and to thus force the free coiled end of the strip against the underlying layer until the cam-roller of lever 34 engages the full section of cam 33, and the pressure-bar 31 is thus raised. The further rotation of shaft 1 causes the collar 16 to move to the right by cam 17, cross-head 20, guide-rods 25, and cross-piece 102 to first release the finger 21 from the shoulder 27, whereupon an opening of finger 14 is effected by spring 23. After the inner end of the strip has thus been released the finished box is moved by coller 16 to the right along the mandrel until it arrives beneath the label-magazine 35. During this longitudinal movement of the box along mandrel 13 the inner free end of the strip passes the slope 41 and is thus glued against the inside of the box. The label-magazine will now be lowered by lever 38, connecting-rod 37, and lever 36 until the lowermost label touches the glue-box and adheres thereto. In the meantime the wheel 29 has turned so far that the shorter-toothed portion engages wheel 30 to rotate mandrel 13, together with the finished box, this rotation causing the label to be taken along. During this rotation the cam-roller engages the receding section of cam 19, and the spring 40 will press roller 4 against the label to glue it against the underlying layer of paper. After the label has been thus secured the mutilated toothed wheel 29 ceases to engage with toothed wheel 30 and the rotation of mandrel 13 ceases. During this stoppage the strip for the next box is introduced into slot 100 of mandrel 13, the slot 28 of collar 16 permitting the strip to enter slot 100 during the backward movement of the collar.

What I claim is—

1. A machine for making paper boxes provided with a slotted tubular mandrel, a spring-influenced finger pivoted within the mandrel, a sliding collar embracing the mandrel, and provided with a pin that projects into the mandrel and is adapted to engage the finger, substantially as specified.

2. A machine for making paper boxes provided with a slotted tubular mandrel, a finger for clamping the paper within the mandrel-slot, a label-magazine above the mandrel, and a sliding collar adapted to operate the finger and to move the paper along the mandrel to the label-magazine, substantially as specified.

3. A machine for making paper boxes provided with a mandrel, means for coiling a strip of paper around the mandrel, means for feeding the coil along the mandrel, a label-magazine above the mandrel, and means for lowering the magazine upon the coil, substantially as specified.

4. A machine for making paper boxes provided with a mandrel, means for coiling a strip of paper around the mandrel, means for feeding the coil along the mandrel, a label-magazine above the mandrel, means for lowering the magazine upon the coil, and a roller for pressing the label against the coil, substantially as specified.

Signed by me at Dusseldorf, Germany, this 29th day of January, 1902.

FERD EMIL JAGENBERG.

Witnesses:

WILLIAM ESSENWEIN,

PETER LIEBER.