No. 609,007. Patented Aug. 16, 1898.

W. H. BUTLER.

CUTTING AND PRINTING MECHANISM.

(Application filed Dec. 15, 1896.)

(No Model.) 2 Sheets—Sheet 1.

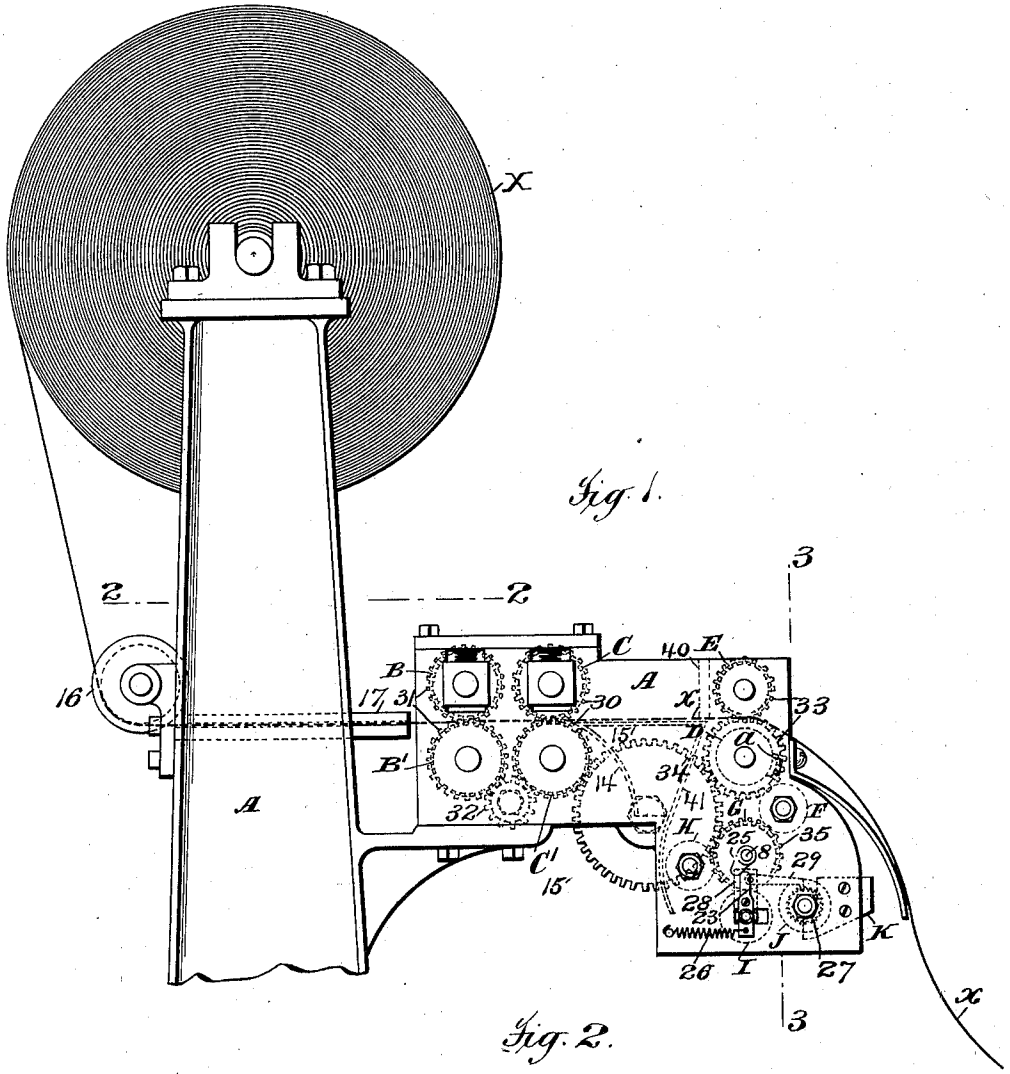
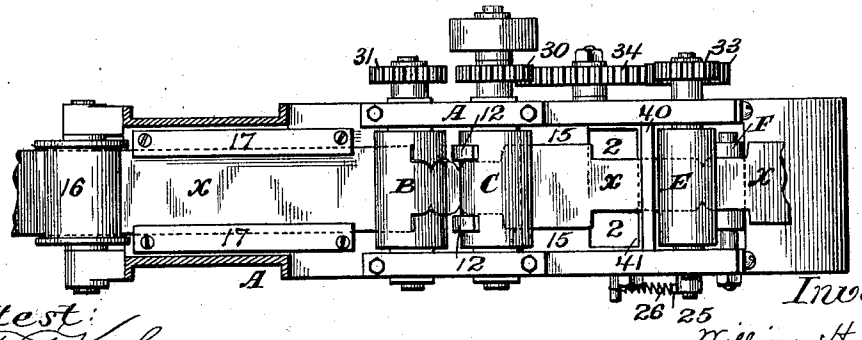


Fig. 1.

Fig. 2.



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Fig. 3.

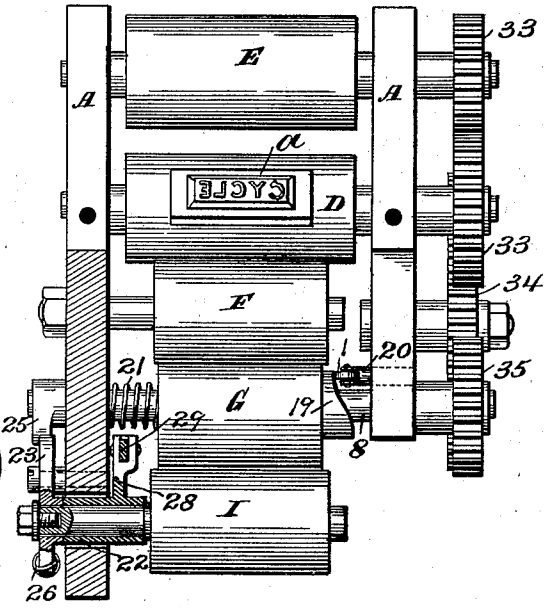


Fig. 6.

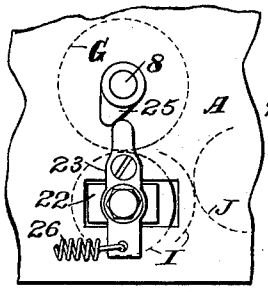


Fig. 4.

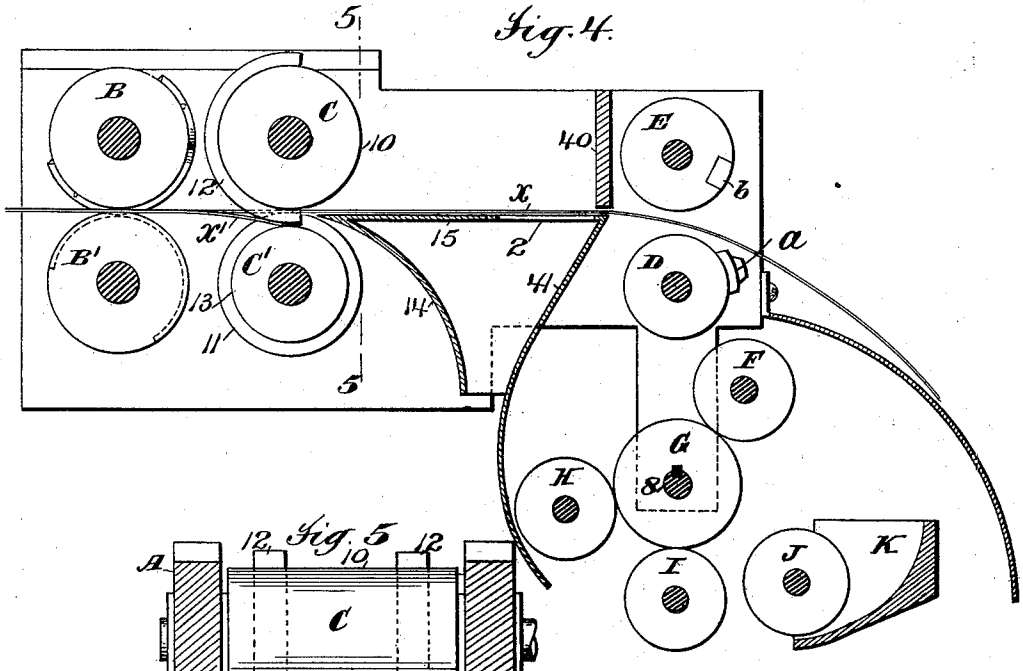
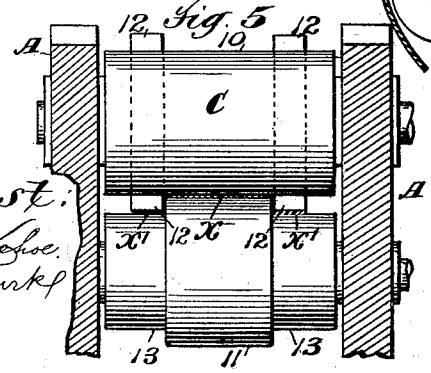


Fig. 5



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UNITED STATES PATENT OFFICE.

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CUTTING AND PRINTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 609,007, dated August 16, 1898.

Application filed December 15, 1896. Serial No. 615,735. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BUTLER, a citizen of the United States, residing at Harrison, county of Westchester, and State of New York, have invented certain new and useful Improvements in Cutting and Printing Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide an improved cutting and printing mechanism for cutting portions from a strip of cardboard or other suitable material and printing on the strip, the construction being especially adapted for forming box-blanks from a strip of material and for attachment to box-making machines, packing-machines, and similar machines by which box-blanks are formed into boxes, either with or without filling, although it will be understood that my improved construction may be used also either as a separate machine or combined with other mechanisms for acting on a strip of suitable material for other purposes.

As a full understanding of the invention can best be given by a detailed description and illustration of a construction embodying the same, such a description will now be given in connection with the accompanying drawings, showing a construction embodying all the features of the invention in their preferred form, and the features forming the invention then specifically pointed out in the claims.

In the drawings, Figure 1 is a side view of the construction. Fig. 2 is a plan view, the frame being sectioned on the line 2 of Fig. 1. Fig. 3 is a vertical section, on an enlarged scale, looking to the left from the line 3 of Fig. 1. Fig. 4 is a central longitudinal section of the cutting, feeding, and printing devices on the same scale as Fig. 3. Fig. 5 is a cross-section looking to the left on the line 5 of Fig. 4. Fig. 6 is a detail side view of the ductor and fountain roll and their actuating devices.

Referring to said drawings, A is the frame, which may be of any suitable form to support the operating parts, B B′ a pair of cutting-cylinders by which portions are cut from a strip of material so as to form a strip of blanks of the desired form, and C C′ are a pair of feeding-rolls in advance of the cutting-rolls B B′. The upper roll C is provided with a feeding-surface 10, coacting with the feeding-surface 11 of the lower cylinder C′ to feed forward the strip x of blanks, and with a feeding-segment 12 at each end of the roll C, coacting with depressed feeding-surfaces 13 on the lower roll C′ to feed the portions x' cut from the strip in forming the blanks, these portions x' cut from the strip being guided downward away from the strip and delivered from the machine by the curved guide 14. The segments 12 are of such height as to assure the separation of the cut portions x' from the body of the strip x and their proper delivery by the guide 14 by positively depressing the leading ends of these portions to the proper side of the guide 14.

The strip x is shown as fed to the cutting-rolls B B′ from a web-roll X, supported in the upper part of the frame, the strip passing around the guide-roll 16 and between side guides 17, so as to be delivered accurately to the cutting-rolls B B′.

Beyond the feeding-rolls C C′ the strip x of blanks passes over a support 15 above the guide 14 and then to the printing devices, which in the form shown consist of the type and impression rolls D E, the type-roll D being shown as carrying a single printing-plate a, although two or more plates may be used for a plurality of impressions to each rotation of the rolls. The impression-roll E carries one or more impression-blocks b, of rubber or similar yielding material, so that the rolls may be positioned for a heavy impression without danger of injury to the printing-plate if the machine be run without a strip in it. The plate a is inked from a form-roll F, supplied with ink from a supply-roll G, coacting with distributing-roll H and taking ink from the ductor-roll I, which moves between the supply-roll G and the fountain-roll J, running in the fountain K.

For the proper distribution of the ink on supply-roll G, in connection with the distributing-roll H, this roll G is mounted to slide upon the shaft 8, by which it is rotated, being shown as splined to the shaft, and this roll G carries at one end a cam 19, which engages a roller 1, inserted in a pin 20 on the frame, so that as the roll G rotates with its shaft 8 it is

moved longitudinally of the shaft by the engagement of the cam 19 with the roller 1 on pin 20 and returned to position by coiled spring 21 on the shaft.

The ductor-roll I is moved between the supply-roll G and fountain-roll J, so as to carry ink from the latter to the former, by the movement of a block 22, sliding horizontally in a slot in the frame, and in which the roll I is mounted, this block being actuated to carry the ductor-roll I into contact with the fountain-roll J by lever 23, connected to the block 22 and engaged by an arm 25 on the shaft 8, this lever 23 being pivoted on the frame and returned to position after engagement by the arm 25 by the spring 26. The block 22 is shown in Fig. 6 as narrower than the slot in the frame in which it moves, so as to have some vertical movement therein, thus permitting the slight vertical movement of the block which results from the swinging of the lever 23, to which the block is pivoted. The fountain-roll J carries inside the frame a ratchet-wheel 27, and the block 22 is provided inside the frame with an arm 28, carrying a pivoted pawl 29, which engages the ratchet-wheel 27 and thus rotates the fountain-roll J as the ductor-roll I is moved into contact with the fountain-roll J.

The parts may be driven by any suitable means; but in the construction shown all are driven from the shaft of the roll C through suitable gearing, as follows: The rolls C C′ are geared together by gears 30 and the feed-rolls B B′ by gears 31, the latter being driven from shaft of roll C′ through intermediate 32. The type and impression rollers are geared together by gears 33 and driven from the shaft of roll C through a large intermediate 34. This intermediate also drives shaft 8 through gear 35 thereon.

Above the support 15 is a guard or partition 40, under which the strip passes to the type and impression rolls D E, this partition acting to prevent the dust and small particles of material resulting from the cutting and feeding of the cardboard strip from passing forward to the type and impression rolls, where they would interfere with the printing, and to guide the strip so that it will pass to the type and impression rolls properly. The support 15 is shown as formed of a plate provided with an opening 2 behind the partition 40, through which said dust and light material will fall, the support 15, with the sides of the frame and partition 40, thus forming a box through which the strip passes. It will be understood, however, that the support 15 may be formed of separate bars or in any other suitable manner to support the strip and at the same time permit loose material to pass through. Below the support 15 and just behind the type-roll D is a guard 41, extending downward a sufficient distance to protect the inking devices from dust and similar light material passing through the opening 2 or carried forward below the guide 14, the entire printing devices thus being kept clear of such material.

It will be understood that the printing devices will be omitted if the strip is not to be printed and that the printing devices may be used also for printing without the cutting and feeding devices illustrated, so that these two groups of devices form in themselves parts of the invention, although preferably used together.

By the terms "segmental portion" and "segment," as applied to the projecting portions of one of the feeding-rolls, it is meant that such portions extend only partially around the roll, so that they may act only during a part of the movement of the rolls and separate from the strip successive portions cut therefrom, as the portions x', and move the leading end of such cut portions transversely to the strip to the proper side of the guide 14 without preventing the feed with the strip of any parts of the strip that it may be desired to leave between the successive cut portions, and these terms are intended to cover such projecting portions even though they do not extend circumferentially of the roll, so as to form feeding-segments by which the cut portions are fed longitudinally, as in the preferred construction shown.

What I claim is—

1. The combination with devices for cutting portions from a strip of material, of feeding devices for advancing the strip of material, a guide for directing the portions cut from the strip away from the strip, and means between said cutting devices and said guide for separating the leading ends of successive cut portions from the strip and moving them transversely to the strip to the proper side of the guide to secure their proper guidance, substantially as described.

2. The combination with devices for cutting portions from a strip of material, of feeding devices acting upon the strip of material and portions cut therefrom, a guide for directing the portions cut from the strip away from the strip, and means in connection with said feeding devices for separating the leading ends of successive cut portions from the strip and moving them transversely to the strip to the proper side of the guide to secure their proper guidance, substantially as described.

3. The combination with devices for cutting portions from a strip of material, of a guide for directing said portions away from the strip, and feeding-rolls between said cutting devices and said guide having feeding-surfaces engaging the strip and one of said rolls having a projecting segmental portion whereby successive portions cut from the strip are separated from the strip and moved transversely to the strip to the proper side of the guide to secure their proper guidance, substantially as described.

4. The combination with devices for cutting portions from a strip of material, of a

guide for directing said portions away from the strip, and feeding-rolls between said cutting devices and said guide having feeding-surfaces engaging the strip and having one a projecting segmental portion and the other a coacting feeding-surface whereby successive portions cut from the strip are separated from the strip and moved transversely to the strip to the proper side of the guide to secure their proper guidance, substantially as described.

5. The feeding-rolls C, C′ having feeding-surfaces 10, 11, said roll C having feeding-segment 12 projecting above feeding-surface 10 and coacting with feeding-surface 13 on roll C′ below feeding-surface 11, in combination with a guide on opposite sides of which material is fed by the feeding-surfaces, substantially as described.

6. Feeding-rolls C, C′ having feeding-surfaces 10, 11, said roll C having feeding-segment 12 projecting above feeding-surface 10 and coacting with feeding-surface 13 on roll C′ below feeding-surface 11, substantially as described.

7. The combination with the cutting-rolls B, B′, of the feeding-rolls C, C′ having feeding-surfaces 10, 11 engaging the strip, said roll C having a segment 12 projecting above feeding-surface 10, substantially as described.

8. The combination with the cutting-rolls B, B′, of the feeding-rolls C, C′ having feeding-surfaces 10, 11 engaging the strip, said roll C having a segment 12 projecting above feeding-surface 10, and a guide on opposite sides of which the strip and portions cut therefrom are fed, substantially as described.

9. The combination with the cutting-rolls B, B′, of the feeding-rolls C, C′, having feeding-surfaces 10, 11 engaging the strip, said roll C having feeding-segment 12 projecting above feeding-surface 10 and coacting with feeding-surface 13 on roll C′ below feeding-surface 11, and a guide on opposite sides of which the strip and portions cut therefrom are fed, substantially as described.

10. The combination with the cutting-rolls B, B′, of the feeding-rolls C, C′ having feeding-surfaces 10, 11 engaging the strip, said roll C having feeding-segment 12 projecting above feeding-surface 10 and coacting with feeding-surface 13 on roll C′ below feeding-surface 11, guide 14 between the strip and portions cut therefrom, support 15 for the strip having opening 2, and guards 40, 41 above and below the strip, substantially as described.

11. The combination with the supply-roll G, and arm 25 rotating therewith, of lever 23, sliding block 22 supported in the frame and engaged by the lever, ductor-roll I mounted in the block, fountain-roll J, a ratchet on the fountain-roll, and a pawl carried by the block for rotating said fountain-roll, and means for returning the lever, substantially as described.

12. The combination with the supply-roll G, and arm 25 rotating therewith, of lever 23, sliding block 22 supported in the frame and engaged by the lever, and ductor-roll I mounted in the block, substantially as described.

13. The combination with supply-roll G, its shaft 8 and means for moving the roll longitudinally on its shaft, of ductor-roll I, and fountain-roll J, sliding block 22 supported in the frame and carrying the ductor-roll, lever 23 engaging said block, arm 25 on shaft 8 actuating the lever, and means for returning the lever, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. H. BUTLER.

Witnesses:
JOSIAH T. WILCOX,
EDWARD T. SMITH.