Aug. 7, 1923. 1,463,879

W. DOWNING

FOLDING MACHINE

Filed Nov. 6, 1920

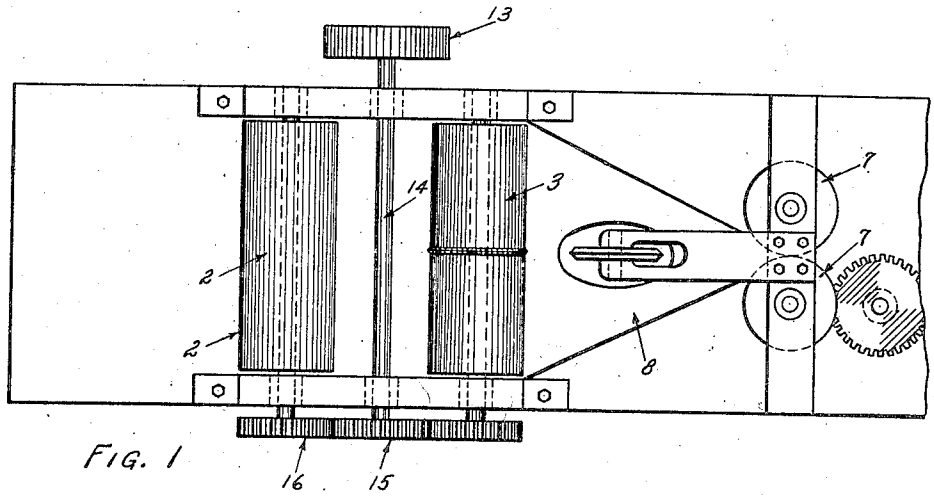


FIG. 1

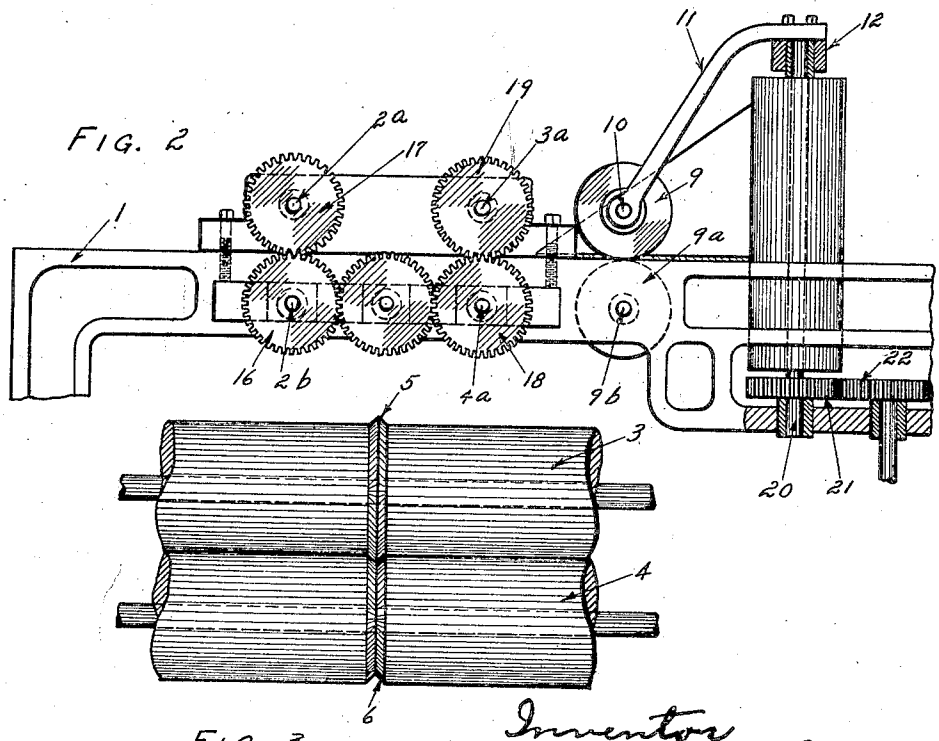


FIG. 2

FIG. 3

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UNITED STATES PATENT OFFICE.

WELLINGTON DOWNING, OF ERIE, PENNSYLVANIA.

FOLDING MACHINE.

Application filed November 6, 1920. Serial No. 422,316.

To all whom it may concern:

Be it known that I, WELLINGTON DOWNING, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Folding Machines, of which the following is a specification.

The folding machine forming the subject matter of this invention is designed to make a continuous fold and in order to accomplish this the paper is initially creased on the line of the fold. By making a progressive fold a closer fold is accomplished than where the fold is made simultaneously throughout the length of the paper.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows a plan view of the machine.

Fig. 2 a side elevation of the same.

Fig. 3 an end elevation of a part of the creasing rolls.

1 marks the frame of the machine. A pair of feed rolls 2—2 are mounted on the shafts 2^a and 2^b journaled in the frame of the machine. A pair of creasing rolls 3 and 4 are mounted on the shafts 3^a and 4^a respectively and these shafts are journaled in the machine. The roll 3 has a creasing rib 5 which operates in a creasing groove 6 in the roll 4. The folding rolls 7—7 are perpendicular to the rolls 3 and 4.

The paper is fed through the feeding rolls to the creasing rolls and is then brought up together and passed through the folding rolls thus progressively folding the paper and permitting the folding with very great rapidity. Further the fold formed in this way is a closer fold than where the fold is made simultaneously throughout the length of the fold.

In order to better guide the paper an apron or guide 8 is mounted on the frame between the rolls 3 and 4 and the roll 7. This guide conforms to the path of the paper in the span between these rolls, that is, when it starts the end towards the rolls 3 and 4 is practically horizontal and the ends adjacent to the rolls 7 have the two sides folded toward each other so that the paper is guided into the rolls 7. In order to assure the proper alinement in this movement the deflecting rolls 9 and 9^a are arranged along the line of the crease, the roll 9 having a bevelled edge corresponding to the shape of the paper as it passes the roll. The guide 8 has an opening through it permitting the roll 9^a to contact the paper and thus assist in moving it forward to the folding rolls. The roll 9^a is mounted on a shaft 9^b journaled in the frame and the roll 9^a on a shaft 10 mounted in an arm 11 extending from a cross piece 12 on the frame.

The rolls 2 and 3 and 4 are driven from a pulley 13 mounted on a shaft 14. The shaft 14 is journaled in the frame. A gear 15 is fixed on the shaft 14 and meshes with a gear 16 on the shaft 2^b. The gear 16 meshes with a gear 17 on the shaft 2^a. The gear 15 also meshes with a gear 18 on the shaft 4^a and the gear 18 meshes with a gear 19 on the shaft 3^a. The rolls 7 are mounted on the shafts 20 journaled in the frame and are driven through gears 21 and 22, the gear 22 being connected with the drive mechanism in any convenient manner.

In operating the machine the paper passes through the feed roll and is creased by the creasing roll and is carried by the guides into the bite between the folding rolls, the rolls 9 and 9^a assisting in the deflection of the paper and in feeding it forward.

What I claim as new is:—

1. In a folding machine, the combination of a pair of creasing rolls; a pair of folding rolls at right angles to the creasing rolls; and a deflecting roll operating along the line of the crease within the fold between the creasing rolls and the folding rolls.

2. In a folding machine, the combination of a pair of creasing rolls; a pair of folding rolls at right angles to the creasing rolls; and a deflecting roll operating along the line of the crease within the fold between the creasing rolls and the folding rolls, the deflecting roll having a bevelled edge.

3. In a folding machine, the combination of a pair of creasing rolls; a pair of folding rolls at right angles to the creasing rolls; and a guide between the creasing rolls and the folding rolls following the path of the

paper passing in the trough of the guide from the creasing rolls to the folding rolls.

4. In a folding machine, the combination of a pair of creasing rolls; a pair of folding rolls at right angles to the creasing rolls; and a guide between the creasing rolls and the folding rolls following the path of the paper passing from the creasing rolls to the folding rolls, said guide having an opening therethrough and rolls operating on the paper at the opening.

In testimony whereof I have hereunto set my hand.

WELLINGTON DOWNING.