

J. G. BINDER, JR., & H. K. KING.

FOLDING MACHINE.

APPLICATION FILED MAR. 20, 1911.

1,084,246.

Patented Jan. 13, 1914.

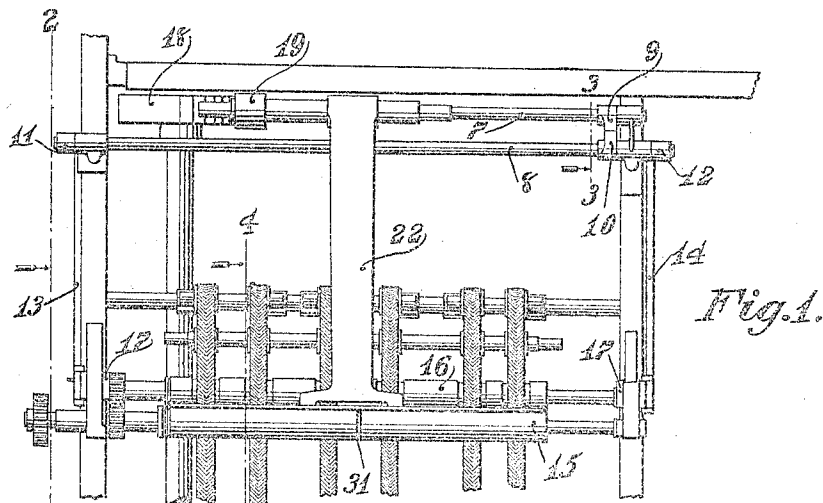


Fig. 1.

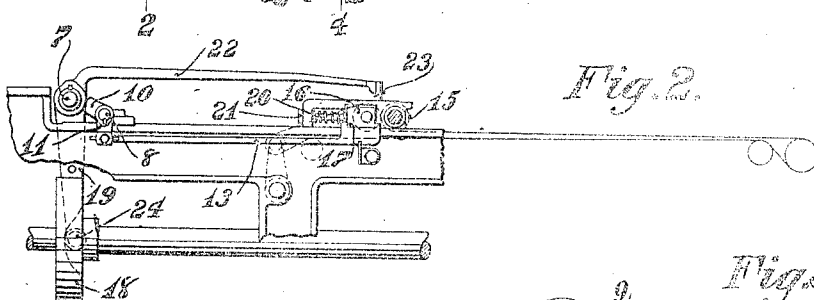


Fig. 2.

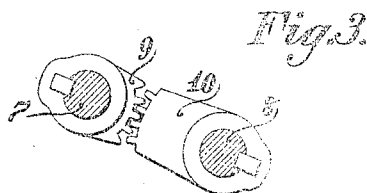


Fig. 3.

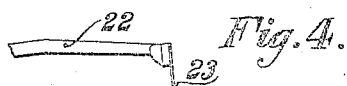


Fig. 4.

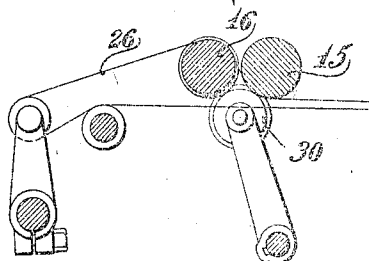


Fig. 5.

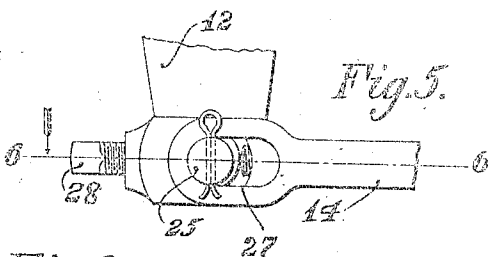


Fig. 6.

WITNESSES:

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FOLDING-MACHINE.

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1,084,246.

Specification of Letters Patent.

Patented Jan. 13, 1914.

Application filed March 20, 1911. Serial No. 615,710.

To all whom it may concern:

Be it known that we, JOHN GEORGE BINDER, JR., and HOWARD K. KING, citizens of the United States, residents, respectively, of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a new and useful Folding-Machine, of which the following is a specification.

Our invention relates to improvements in folding machines.

Our object is to provide improved means for preventing the undesirable creasing, wrinkling, or distortion of the sheet passing through a pair of folding rollers.

The invention is especially applicable to folding machines adapted to operate on very thin sheets of paper such as india paper.

Referring to the drawings, illustrating as an example means for realizing the invention—Figure 1 is a plan view of a portion of a folding machine to which our device is applied. Fig. 2 is a sectional elevation on line 2—2 of Fig. 1. Fig. 3 is a vertical section, on an enlarged scale, on line 3—3 of Fig. 1. Fig. 4 is a vertical section, on an enlarged scale, on line 4—4 of Fig. 1. Fig. 5 is a fragmentary view of a detail in elevation, on an enlarged scale, showing the end of the connecting rod and actuating arm. Fig. 6 is a horizontal section, on a reduced scale, on line 6—6 of Fig. 5.

Similar numerals refer to similar parts throughout the several views.

It has been found that when a sheet of very thin paper is struck into the folding rollers by the folding blade it is desirable in order to get an extremely accurate fold, that is a fold perfectly square and true, that the folding rollers should be very close together. This assures the sheet being seized squarely and carried squarely through the rollers and also assures, as a consequence, that the perforating of the line for the next fold shall also be true. When, however the sheet is a very thin one and the rollers are very close together there is a tendency, if the rollers are maintained close together, for the sheet to get wrinkled as it passes through the rollers. It has therefore been discovered that by striking the sheet into the folding rollers while the same are very close together a square start of the sheet is secured and consequently accurate perforation along the line of the next fold. As soon however as the

sheet has been engaged by the carrying tapes passing around the folding rollers, the rollers may then be slightly open or separated and the balance of the sheet passes through without the slightest distortion or wrinkling. To secure this object we have employed for example the following mechanism: The folding rollers are indicated by 15 and 16 and, as is customary, one of the rollers, for example 16, is mounted in boxes having a sliding relation with the stationary framework and controlled by springs, one of which is shown in Fig. 2 and indicated by the numeral 20. The head of bolt or bar 21, which is adjustable, limits the spring actuated movement of roller 16 toward roller 15. The rocking shaft 7 upon which is mounted the arm 22 of the folding blade 23 is actuated in the usual way by the arm 19 provided with the anti-friction wheel 24 operated by the cam 18. Upon the rocking shaft 7 is provided one element 9 of a sector gear which coöperates with the other gear element 10 mounted on rocking shaft 8. The rocking shaft 8 is provided at each end with arms 11 and 12 which are provided at their lower or free ends with the pins 25 which in turn engage in the slots of the connecting rods 13 and 14. These connecting rods 13 and 14 are in turn connected with the slidably mounted spring controlled journal boxes 17 of roller 16. The proportion and relation of parts are such that as the folding blade 23 approaches the rollers, roller 16 is permitted to assume its closest position with respect to roller 15, but by the time the sheet has been engaged between tapes 26 and roller 15, and the blade 23 has started to withdraw from the rollers the rollers 15 and 16 are separated sufficiently to permit the balance of the sheet to pass therebetween without distortion.

It will be noted that the pins 25 operate in slots 27 of connecting rods 13 and 14, which permits of a dwell of the roller 16 in the closed position at the commencement of the folding operation. In order to secure this dwell at the desired relative time with respect to the other operations of the machine, means are provided for adjusting the positions of pins 25. This consists in securing the pins 25 in slots provided in arms 11 and 12 by means of the set screws 28, that is, by moving the set screws in one direction

the pin is moved slightly to the right, and in the other direction, slightly to the left. The parts are then held in locked position by the nut 29.

30 indicates the usual perforating roller which coöperates with the groove 31 in roller 15, and it follows that if the sheet is delivered to and engaged squarely by the folding rollers, the perforating wheel will produce an accurate line of perforations for the next fold of the sheet.

It will be obvious that other means than those above specifically shown, by way of example, as suitable for realizing our invention may be provided without departing from the spirit of our invention. That is to say, the main point is that the folding rollers shall be so controlled by means, operating relatively to the other operating parts of the machine, that, after being maintained in the close or folding position until the preliminary part of the fold is accomplished, are then caused to separate slightly so that the balance of the sheet shall pass through without becoming wrinkled.

What we claim is:—

1. In a folding machine, the combination of a folding blade and coöperating folding rollers, one of which has a translative movement, actuating means for causing said movement, means for actuating the folding blade, and means for adjusting the relative actuation of the roller actuating means with respect to the actuating means of the folding blade.

2. In a folding machine, the combination of folding rollers, carrying tapes and a coöperating folding blade, means for actuating the folding blade, and means for causing a translative movement of one of the rollers, said means, operating relatively to the actuation of the folding blade, providing a dwell of the rollers in the desired position until the sheet has been secured by the carrying tapes,

and then a separation of the rollers until the sheet has passed between them.

3. In a folding machine, the combination of carrying tapes, folding rollers and a folding blade, a rocking shaft and means for actuating the same to actuate the folding blade, a countershaft having operative relationship with the first rocking shaft, a rock arm and connecting rod on said countershaft, and movable journal boxes for one of the rollers actuated by said connecting rod.

4. In a folding machine, the combination of carrying tapes, folding rollers and a folding blade, a rocking shaft and means for actuating the same to actuate the folding blade, a countershaft having operative relationship with the first rocking shaft, a rock arm on said countershaft, movable journal boxes for one of the rollers and means for communicating movement from the rock arm to the journal boxes, said means comprising connecting rods provided with slots to permit play between the rock arm and said rod.

5. In a folding machine, the combination of carrying tapes, folding rollers and a folding blade, a rocking shaft and means for actuating the same to actuate the folding blade, a countershaft, having operative relationship with the first rocking shaft, a rock arm and connecting rod on said countershaft, movable journal boxes for one of the rollers actuated by said connecting rod, the rock arm provided with a slot and a pin or stud thereon, and means for adjustably securing the pin or stud, the connecting rod provided with a slot for coöperating with said pin or stud, the parts proportioned and positioned to secure the required dwell of the rollers in the folding position.

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Witnesses:

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