

April 13, 1926.

1,580,759

A. OLSON

PAPER FOLDING MACHINE

Filed August 13, 1923

FIG. 1.

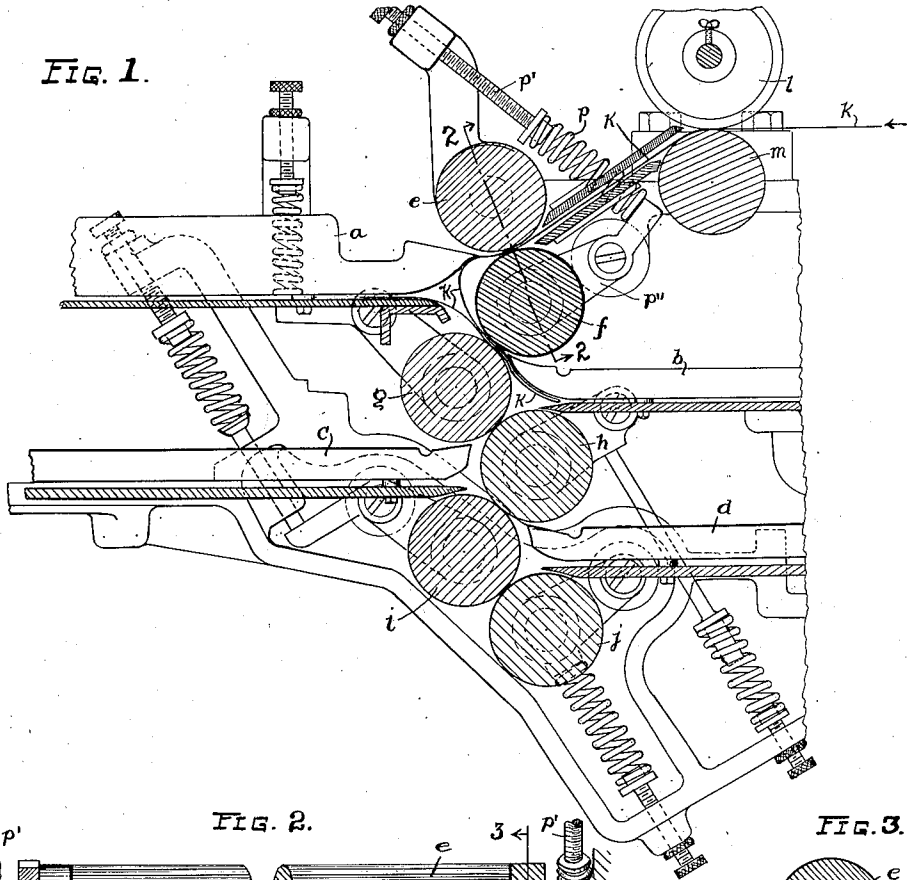


FIG. 2.

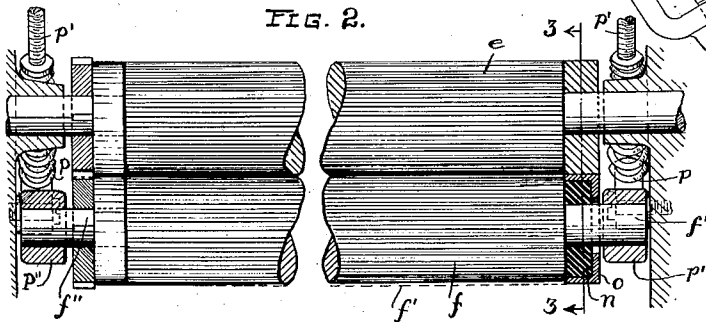


FIG. 3.

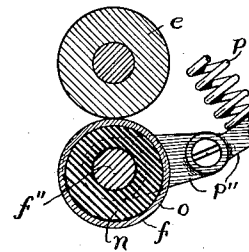


FIG. 4.

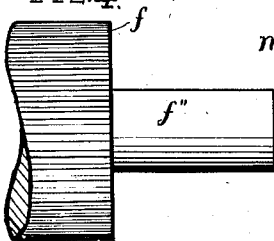


FIG. 5. FIG. 6.

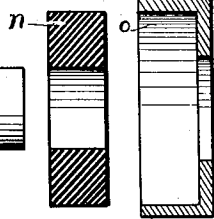


FIG. 7.

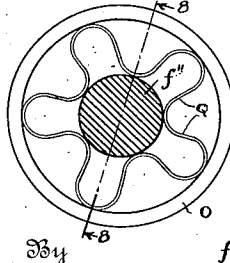
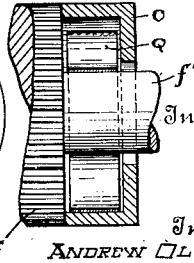


FIG. 8.



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PAPER-FOLDING MACHINE.

Application filed August 13, 1923. Serial No. 657,235.

To all whom it may concern:

Be it known that I, ANDREW OLSON, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Paper-Folding Machines, of which the following is a specification.

My invention relates to improvements in paper-folding machines and more particularly to the mounting of the rolls in such machines. The object of my invention is to insure better operation of the folding rolls by providing a self-adjusting mounting therefor.

It is a common experience in the industry to find a roll or rolls of the bank or series of rolls of a paper-folding machine worn unequally at one end, and especially is this true where knurled rolls are employed. This results from the fact that all of the sheets of paper, whether of broader or narrower dimensions, must pass through a given set or sets of rolls and in the same lateral position, as at the right hand ends thereof. Moreover, the first pass of rolls necessarily must be encountered by all of the sheets handled by the machine, thereby contributing to the undue wear of said rolls. Accordingly, I have devised means for successfully compensating for such unequal wear and permitting the proper operation of the folding machine for an indefinite period, regardless of material wear and consequent decrease in diameter throughout a portion of the lengths of its rolls.

The structural details, incorporating my improvements and their advantages and operations of the folding machine to which my invention is applied, may be better explained in connection with the accompanying drawings, wherein:

Figure 1 is a vertical sectional view, partially diagrammatic and fragmentary in character illustrating the coacting sets of rolls for four different folding plates.

Fig. 2 is a fragmentary view, partially broken away and in section, illustrating two of such rolls in side elevation.

Fig. 3 is a sectional view of the mounting on line 3—3, Fig. 2.

Fig. 4 is a fragmentary view of one end of a roll.

Fig. 5 is a vertical sectional view of its rubber mounting member.

Fig. 6 is a vertical sectional view of its enclosing cap.

Fig. 7 is an end view showing a modification of the resilient mounting, and

Fig. 8 is a fragmentary view showing the end of the roll and a vertical section on line 8—8, Fig. 7.

Throughout the several figures of the drawings I have employed the same character of reference to indicate similar parts.

Referring first to Figure 1, the four folding plates *a*, *b*, *c* and *d* will readily be recognized in their co-operative relation with the folding rolls *e*, *f*, *g*, *h*, *i* and *j*. The paper *k* is shown as it passes between the feeding rolls *l* and *m*; being buckled between the rolls *f* and *g* to enter the folding plate *b* in accordance with the well known practice in folding machines.

As all of the paper handled must pass between the rolls *e* and *f* initially and on the right hand sides or ends thereof, their knurled surfaces are subjected to undue wear, as I have endeavored to indicate by the dotted line *f'* and the localized spacing between the rolls, although of somewhat exaggerated showing, in Fig. 2. It should be explained that the adjusting springs are understood to be relaxed, inasmuch as the roll *f* is equipped with my self-conforming mounting, shown upon the extreme right in Fig. 2.

It will be observed that the shaft *f''* of the knurled roll *f* is provided with a heavy resilient member or washer *n* of molded rubber closely enclosed in the apertured steel cap *o*. When the adjusting spring *p* is tightened by means of its screw *p'* the pivoted mounting *p''* will serve to force the shaft *f''* upward in eccentric relation with the rubber member *n*, as indicated in Fig. 3, thereby engaging the rolls *e* and *f* along their worn right hand portions. Inasmuch as each roll of a set or pass is provided with its individual spring adjustment, compensation may be effected with respect to the next adjacent roll or rolls.

A modification is illustrated in Figs. 7 and 8, wherein the shaft *f''* is engaged by the sinuous spring member *q* maintained within its cap *o* in lieu of the rubber washer *n*, but

accomplishing the same purpose of permitting the eccentric positioning of the shaft and the engagement of the folding rolls.

It will be understood that paper stock, 5 which may be as thin as one-thousandth of an inch, will not be frictionally engaged by two coacting rolls, each of which has been worn away locally along its knurled surfaces for one-thousandth of an inch, sufficiently to actuate it through the coacting 10 folding plate. However, with one of the rolls equipped with the terminal compensating means herein shown and described, it is clear that they may be forced locally 15 into frictional engagement in correction of worn or imperfect sections of the rolls. Thus this simple, resilient mounting permits materially longer operation with the worn rolls of a folding machine, and insures 20 satisfactory signatures therefrom, as compared with the machines of the prior art.

Having now described the folding machine equipped with my improvements, I 25 claim as new and desire to secure by Letters Patent, the following:

1. In a paper-folding machine of the class described, the combination with a pair of coacting folding rolls and folding plate, of 30 a terminal mounting for one of said rolls permitting its eccentric adjustment therein toward the other roll, and an adjustment adapted to affect the eccentric relation of the mounting and the frictional engagement 35 of the rolls, substantially as set forth.

2. In a paper-folding machine of the class described, the combination with paired folding rolls and a coacting folding plate, 40 of a terminal mounting for one of said rolls, comprising a hollow cylindrical member approximately the diameter of the roll and a contained resilient member adapted to assume eccentric relation within the other 45 member, and a spring adjustment acting against said roll and mounting, whereby it

may be brought closely into operative engagement with the other roll, substantially as set forth.

3. The combination with a knurled roll, of a terminal bearing member having slightly 50 greater diameter than the roll, a contained resilient member through which the shaft of the roll extends, and a spring adjustment acting against the shaft to force the shaft and resilient member into eccentric 55 relation with the bearing member, substantially as set forth.

4. The combination with paired co-acting rolls, of a resilient mounting adapted to effect their co-operative engagement; one 60 of said rolls having a terminal mounting permitting its progressive eccentric adjustment therein toward the other roll, substantially as set forth.

5. The combination with paired co-acting 65 rolls, of a spring mounting resiliently pressing them into co-operative relation, and a terminal mounting for one of said rolls comprising a hollow cylindrical member approximately the diameter of the roll and 70 a contained resilient element adapted to assume eccentric relation within said member for insuring improved action of the rolls, substantially as set forth.

6. In a paper-forwarding machine, the 75 combination with paired forwarding rolls, of a terminal mounting for one of said rolls, comprising a cylindrical member approximately the diameter of the roll and an 80 associated resilient member adapted to assume eccentric relation with respect to the other member, and adjusting means acting against said roll and mounting, whereby 85 the body of the roll may be brought closely into operative engagement with the other roll, substantially as set forth.

In testimony whereof I do now affix my signature.

ANDREW OLSON.