G. H. MALLAM.

PAPER CREASING MACHINE.

APPLICATION FILED MAR. 28, 1910.

1,013,411. Patented Jan. 2, 1912.

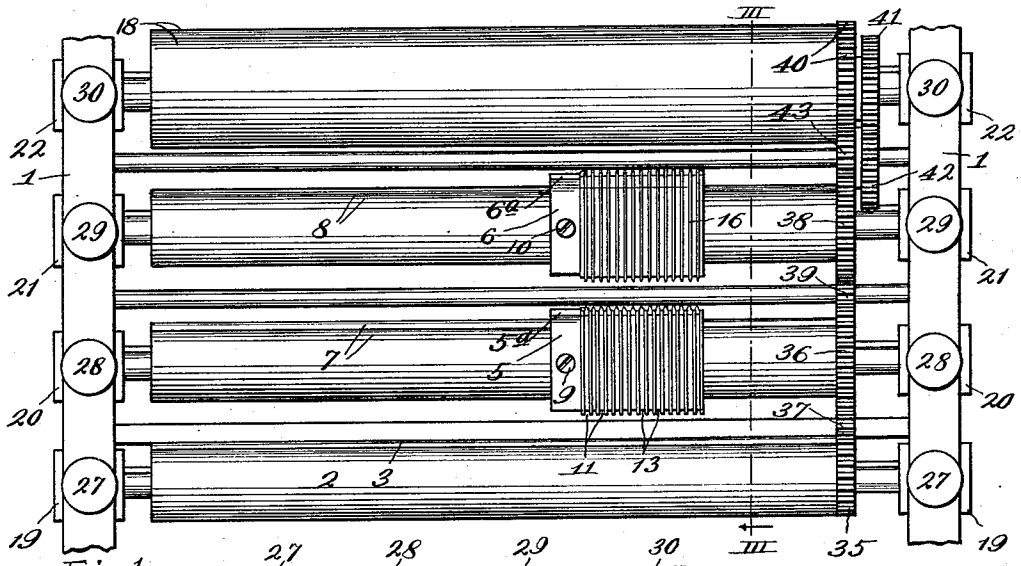


Fig. 1.

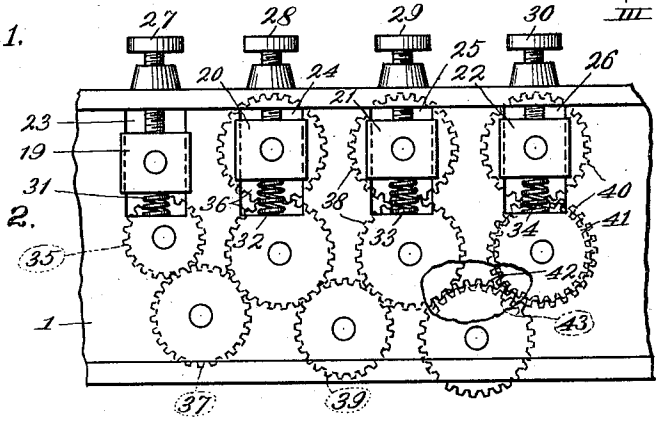


Fig. 2.

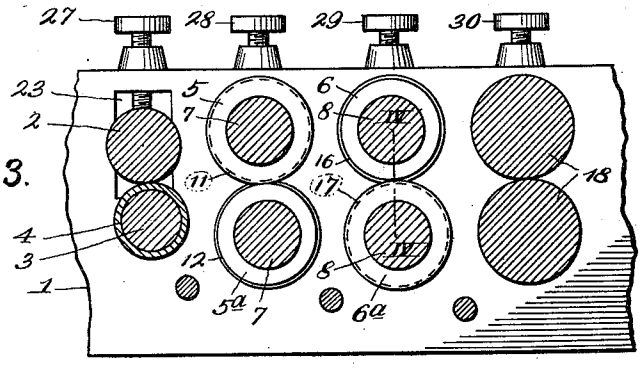
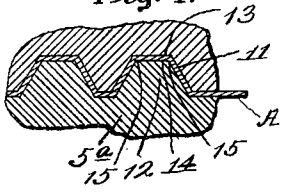


Fig. 3.

Fig. 4.



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PAPER-CREASING MACHINE.

1,013,411. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed March 28, 1910. Serial No. 552,113.

To all whom it may concern:

Be it known that I, GUY H. MALLAM, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Paper-Creasing Machines, of which the following is a specification.

This invention relates to an improved machine for creasing ledger leaves and the like, and one of my objects is to provide a simple, inexpensive machine to neatly and expeditiously crease the leaves of ledgers, blank-books, etc., near their back edges to render them flexible, so that when the books are opened said leaves will lie flat upon each other in convenient position to be written upon.

I obtain great flexibility of the leaves without injury thereto by creasing the same in reverse directions and then ironing out the creases, which latter operation restores the leaves to normal bulk, so that they will not cause a book to bulge at its back when placed therein. I also provide novel means for feeding the leaves straight through the machine so that the creases will be parallel to each other and the back edges of the leaves.

In order that the invention may be fully understood, reference will now be made to the accompanying drawing, in which:

Figure 1 shows a plan view of my improved machine with the frame thereof partly broken away. Fig. 2 is a side elevation of that portion of the machine shown in Fig. 1. Fig. 3 is a vertical section on line III—III of Fig. 1. Fig. 4 is an enlarged broken section on line IV—IV of Fig. 3, of one set of creasing rolls employed in carrying out the invention.

In carrying out the invention I employ a suitable frame 1, in which I mount a pair of feed-rolls consisting of an upper roll 2 and a lower roll 3, the former comprising preferably a heavy steel roll, so that it will press the leaves A into frictional engagement with a rubber covering 4 on roll 3, and thus coöperate with the latter in feeding the leaves forward to the creasing-rolls, hereinafter described. The feed-rolls 2 and 3 preferably extend across the machine in order to grip the leaves their entire width and thus prevent them from sluing around while being fed forward.

The creasing-rolls, of which there are preferably two sets, are arranged in the form of sleeves 5, 5ª, 6, and 6ª, adjustably mounted upon a pair of mandrels 7 and 8, and provided with set-screws 9 and 10, respectively, whereby they may be secured at any desired point upon their respective mandrels. The uppermost sleeve 5 has a plurality of equally-spaced peripheral grooves 11, to receive peripheral ridges or serrations 12 on sleeve 5ª, which form ridges in the leaves by forcing the same upward into the grooves 11. Grooves 11 are substantially V-shaped in cross section, as shown in the enlarged sectional view, Fig. 4, except that their bottom portions or faces 13 are flat instead of pointed; likewise, the apices 14 of the serrations 12 are flat so that each will present two corners 15 to the leaves and bend the same at two points, instead of but one as would be the case if the apices were of true V-form and had but one corner each. The rear set of creasing-rolls is a duplicate of the front set, but the rear rolls are reversely-disposed to the front rolls to depress the ridges formed in the paper by said front rolls; in other words, the upper rear sleeve 6 is provided with serrations 16, arranged in alinement with grooves 11 on the upper front roll 5, as shown in Fig. 1, and said serrations fit into grooves 17 in the lower sleeve 6ª, the grooves of which are in line with the serrations 12.

In addition to creasing the paper in reverse directions, the creasing-rolls also assist in feeding the paper forward in a straight line, and in order that this work may be properly accomplished the front set of creasing-rolls are so proportioned that the paper is gripped between the broad flat faces 13 of grooves 11 and the apices 14, and the rear set of rolls are so proportioned that the paper will be gripped between the broad flat faces of grooves 17 and the apices of serrations 16.

After the ridges formed in the leaves by the front set of creasing-rolls have been reversed or depressed by the second set of creasing-rolls, they are flattened out by a

pair of ironing-rolls 18, arranged in the rear of the second set of creasing-rolls. This last operation reduces the leaves to normal bulk, so that they will not cause the back of the book to bulge when arranged therein.

By referring to Fig. 3, it will be noted that all of the lower rolls are arranged slightly in advance of the upper rolls. I find by experience that this gives the rolls a better grip upon the leaves than if placed immediately above each other, and hence they carry the leaves straight through the machine instead of permitting them to slue around as would be the case if not properly engaged by said rolls, and in order to increase the grip of the latter upon the leaves, I mount the upper rolls 2, 5, 6, and 18 in adjustable bearings 19, 20, 21, and 22, vertically-movable in slots 23, 24, 25, and 26, respectively, in the sides of the frame. Bearings 19, 20, 21 and 22 are depressed by set-screws 27, 28, 29, and 30 against the pressure of expansion springs 31, 32, 33, and 34, respectively, interposed between the bottoms of the slots and the bearings. The foregoing arrangement of set-screws and springs provides convenient means for adjusting the upper rolls into proper relation with the lower rolls to accommodate leaves of any thickness.

The upper feed-roll 2 is of sufficient weight to feed the paper forward in conjunction with roll 3, but as shown its bearings 19 may be provided with the set-screws and springs to obtain any desired pressure upon the paper.

The ironing rolls 18 are driven at a slightly higher speed than the others, in order to keep the paper taut. The gearing whereby the rolls are driven, consists of a gear-wheel 35 fixed to feed-roll 3, a pair of intermeshing gear wheels 36 fixed to mandrel 7, an intermediate gear wheel 37 intermeshing with gear wheel 35 and one of the gear wheels 36, a pair of intermeshing gear wheels 38 fixed to mandrel 8, an intermediate gear wheel 39 intermeshing with one of the gear wheels 36 and 38, and a pair of intermeshing gear wheels 40 fixed to the ironing-rolls 18, the lower one of which latter is also provided with a gear wheel 41 slightly smaller than gear wheels 40 and intermeshing with a large gear wheel 42 integral with a smaller gear wheel 43 intermeshing with the lower gear wheel 38. Power may be applied to any of the gear wheels as will be readily understood.

Having thus described my invention, what I claim is:

1. In a machine of the character described, a set of creasing rolls having intermeshing peripheral grooves and ridges for creasing paper in one direction, one of said creasing-rolls being set slightly in advance of the other, a second set of creasing-rolls having intermeshing grooves and ridges, the ridges of said second set being in line with the grooves of the first set to engage and reverse the creases in the paper, and one of the rolls of said second set being placed slightly in advance of the other, a pair of feed-rolls in advance of the creasing-rolls to carry the paper thereto, one of said feed-rolls being set slightly in advance of its companion, and means for adjusting one roll of each pair and set in proper relation to its companion.

2. In a machine of the character described, a set of creasing-rolls having intermeshing peripheral grooves and ridges for creasing paper in one direction, a second set of creasing-rolls having intermeshing grooves and ridges, the ridges of said second set being in line with the grooves of the first set to engage and reverse the creases in the paper, a pair of ironing-rolls to flatten out the creases, and gearing for driving said ironing-rolls faster than the creasing rolls.

3. In a machine of the character described, a set of creasing-rolls having intermeshing peripheral grooves and ridges for creasing paper in one direction, said rolls having comparatively broad faces between the grooves and ridges to engage and feed the paper forward, and a second set of creasing-rolls having intermeshing grooves and ridges, the latter being in line with the grooves of the first set to engage and reverse the creases in the paper, said second set of creasing-rolls also having broad faces between their grooves and ridges to engage and feed the paper forward.

In testimony whereof I affix my signature, in the presence of two witnesses.

GUY H. MALLAM.

Witnesses:
F. G. FISCHER,
M. COX.