No. 794,401. PATENTED JULY 11, 1905.

M. B. FERGUSON.

PAPER FEEDING DEVICE.

APPLICATION FILED NOV. 14, 1904.

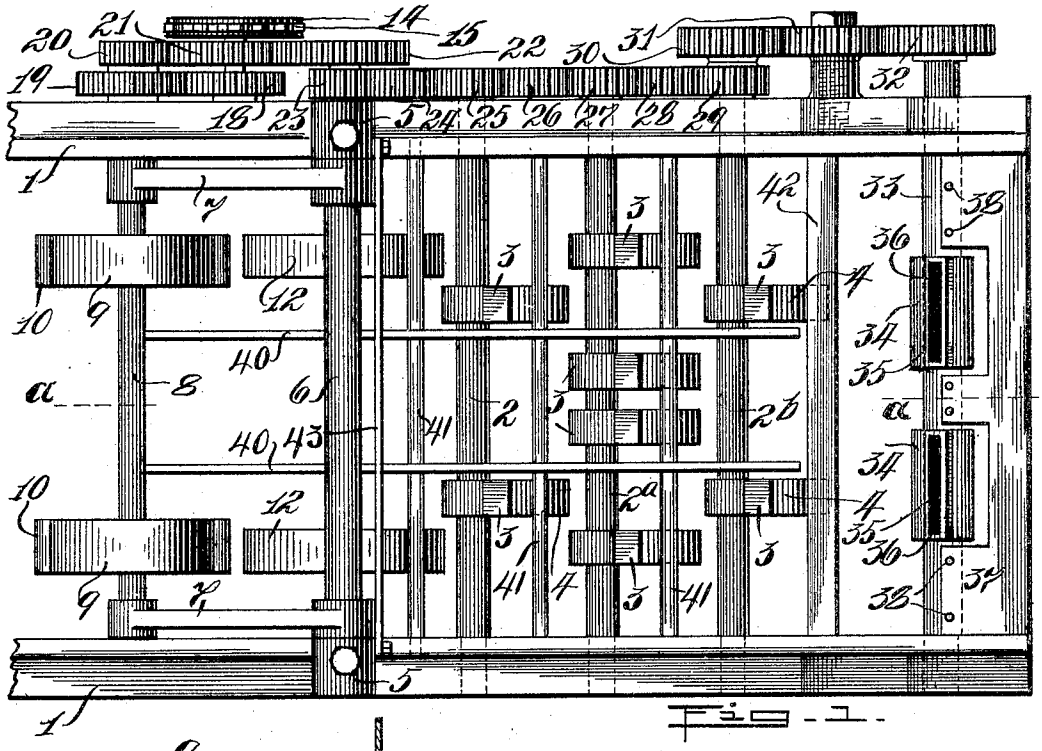


Fig. 1.

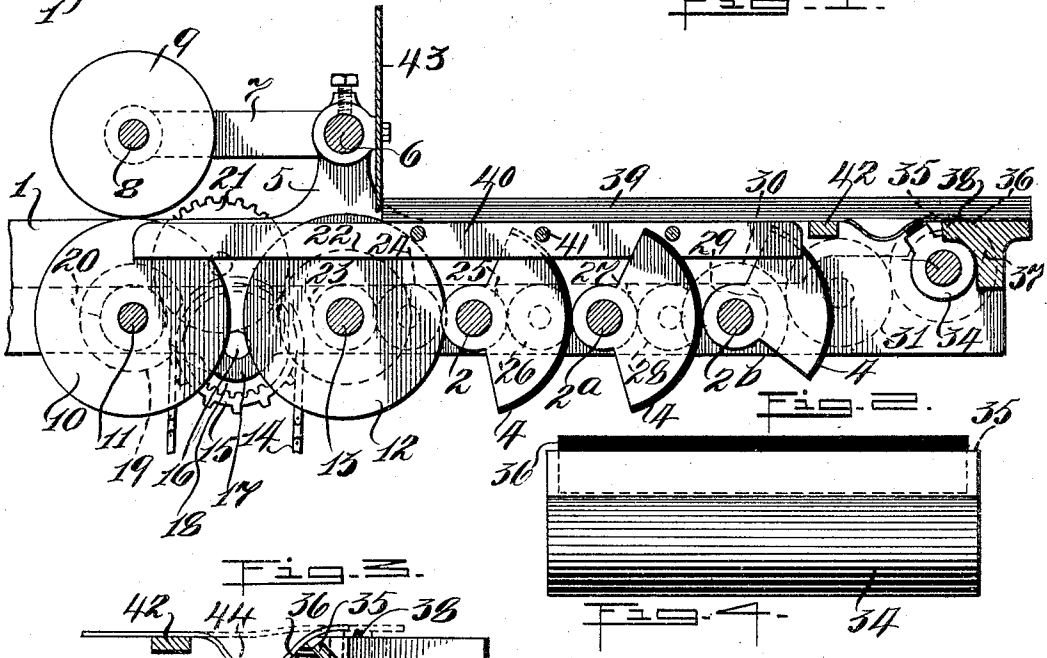


Fig. 2.

Fig. 4.



Fig. 3.

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No. 794,401. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

MILFORD B. FERGUSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN WRAPPING AND BOX MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PAPER-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 794,401, dated July 11, 1905.

Application filed November 14, 1904. Serial No. 232,583.

To all whom it may concern:

Be it known that I, MILFORD B. FERGUSON, a resident of Brooklyn, Kings county, in the State of New York, have invented certain new and useful Improvements in Paper-Feeding Devices, of which the following is a specification.

This invention relates to paper-feeding devices, more particularly to that class adapted to feed successive sheets from a stack or pile of paper, the object of my invention being to provide an improved means whereby the paper or sheets of paper will be readily fed without being torn, such means being adapted to free the bottom sheet of the pile or stack from any locking or hold-back action. My improved device makes possible the feeding of tissue-paper or very thin paper equally as well as thicker paper.

To these and other ends, which will hereinafter appear, the invention consists in the novel features of improvement and combination and arrangement of parts, which will be hereinafter described and finally summarized in the appended claims.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a plan view of a paper-feeding device embodying my invention. Fig. 2 is a section thereof, taken on the line *a a* in Fig. 1 and showing a pile of paper to be fed. Fig. 3 is a detail view of what I term my improved "buckler," showing same in the act of buckling a sheet of paper preparatory to feeding; and Fig. 4 is an enlarged elevation of my improved buckler, showing more plainly the rubber cushion.

Like numerals of reference indicate corresponding parts in the several views.

The accompanying drawings illustrate but one of many ways in which my device may be utilized, and in said drawings the numeral 1 indicates the side rails of a feeding device. Extending across these side rails are shafts 2 2^a 2^b, the said shafts being provided with segmental feeding-disks 3 3 3, and, as will be seen by Fig. 1, the shafts 2 2^a 2^b are provided with two, four, and two of the disks, respectively. Arranging the disks in this manner, substantially staggering them, gives a large surface of contact upon the sheet to be fed without the necessity of providing the shafts with cumbersome apparatus. The peripheral surfaces of the said disks are covered with a rubber mat 4 to give a better grip upon the sheet.

Within the upstanding housings 5 5 a shaft 6 is mounted, having loosely mounted thereupon arms 7, which in turn carry a rotative shaft 8, which in turn has mounted thereupon feeding-disks 9 9, the said disks resting, by virtue of their weight and that of the arms 7 7 and shaft 8, upon another set of feeding-disks 10 10, which are mounted upon a rotative shaft 11, which is in turn carried by the side rails 1 1. Between the disks 10 10 and shaft 2 a set of guide-disks 12 12, mounted upon a rotative shaft 13, are placed. The hereinbefore-described disks are rotated in the same direction or direction of feed, the means of driving being in this instance a sprocket-chain 14 engaging a sprocket-wheel 15. Any suitable means may be employed to transmit motion to the chain 14. The sprocket-wheel 15 is mounted upon a short shaft 16, carried by one of the side rails 1, the shaft 16 being free to rotate in a bearing 17. Mounted upon the shaft 16 is a pinion 18, which pinion meshes with and drives a gear 19, rigidly mounted upon the shaft 11. Also upon the shaft 11 is a pinion 20, which meshes with and drives an idle gear 21, which meshes with and drives a gear 22, rigidly mounted upon the shaft 13. The shaft 13 also has rigidly attached thereto a pinion 23, which meshes with and drives an intermediate gear 24, which drives a gear 25, which operates the shaft 2, and by means of the gears 26, 27, 28, and 29 the shafts 2^a 2^b are likewise operated. The shaft 2^b is provided with a pinion 30, which meshes with an intermediate gear 31, which drives the gear 32, which in turn operates the shaft 33. Upon the shaft 33 are rigidly mounted the hubs 34 34, the said hubs being pro-

vided with sockets 35, Fig. 4, in which are fitted rubber cushions or the like 36 36.

Between the rails 1 1 and adjacent to the hubs 34 is a tailpiece 37, provided with needle-points 38, these points being for the purpose of retaining a pile of paper in position and to prevent more than one sheet being fed at a time. The pile of paper which is shown, Fig. 2, at 39 rests upon rails 40 40, the said rails being supported by rods 41, which extend across the frame between the rails 1 1. A cross-bar 42 is provided adjacent to disk-shaft 2^b at the forward end of the machine, and attached to the uprights 5 5 is an abutment 43, designed to keep a pile of paper in position. The hubs 34, which carry the cushions 36, will be timed slightly in advance of the disks 3 3, so as to insure a perfect feed and also to be sure that the paper is raised from the points 38 before the disks 3 3 commence to pull.

Having described the mechanical construction of the device, its operation will now be explained. The pile of paper when placed on the frame will rest upon the rails 40, bar 42, and needle-points 38. If it were not for the special means I provide, the disks 3 3, &c., upon their revolution would tear the bottom sheet of paper from the points, thus damaging the sheet; but before the said disks have contacted the sheet the cushions 36 will have raised the pile of paper from the needle-points. (See dotted lines, Fig. 3.) This will occur when the cushions 36 have gained a vertical position. Upon further rotation of the hubs 34 the sheet will be forced forward and away from the points 38. As the disks 3 3 have not as yet contacted the sheet, this carrying forward of that part of the sheet adjacent to the said cushions will tend to buckle the same downwardly. (See full line 44, Fig. 3.) At about this point of operation the disks 3 3 may contact the sheet, thereby upon their further rotation feeding the same forward and out between the feed-rolls 9 and 10, where they may be delivered to any desired point.

The construction hereinbefore described, and shown in the drawings, proclaims an intermittent feed; but my invention could be applied to a constant feed. The paper sheet, as shown by full lines, Fig. 3, is technically termed "buckled," and this term as used in the claims is intended to convey this idea. It should also be understood that after the cushion 36 has been revolved enough to buckle the sheet the pile of paper above will settle upon the needle-points 38 again, the buckled sheet being, however, free from the said points at this period. It will be understood that wherever in the specification and claims I refer to "needle-points" other equivalent means for accomplishing a similar result are meant to be covered thereby.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a paper-feeding device, the combination of a plurality of rotating segmental feeders adapted to impinge upon the paper and feed it during a predetermined period of their rotation, and a rotating cushion adapted to impinge upon the paper, slightly in advance of said segmental feeders, carry it forward and buckle same, to facilitate the feeding of the paper by said segmental feeders, substantially as described.

2. In a paper-feeding device, the combination of a support for a pile of paper, needle-points adapted to retain said pile in position, means whereby said pile can be raised from said needle-points, the said means adapted to force forwardly the bottom sheet of said pile and buckle the same, together with a feeding means adapted to take said buckled sheet from said pile.

3. In a paper-feeding device, the combination of a support for a pile of paper, needle-points adapted to retain said pile in position, means whereby said pile can be raised from said needle-points, the said means adapted to force forwardly the bottom sheet of said pile and buckle same, with segmental feeding-disks adapted to take said buckled sheet from said pile.

4. In a paper-feeding device, the combination of a support for a pile of paper, needle-points adapted to retain said pile in position, means whereby said pile can be raised from said needle-points, the said means adapted to force forwardly the bottom sheet of said pile and buckle same, segmental feeding-disks adapted to force said buckled sheet from said pile and deliver the said sheet to a positive feeding device.

5. In a paper-feeding device, the combination of a support for a pile of sheet-paper, means for gripping the under sheets only of said pile, thereby retaining said pile in position, means whereby the bottom sheet of said pile will be released from said gripping means and independently forced forwardly and buckled, and feeding means whereby said buckled sheet will be taken from the pile without disturbing the other sheets of said pile.

6. In a paper-feeding device, the combination of a support for a pile of sheet-paper, means for gripping the under sheets only of said pile, thereby retaining the pile in position, means whereby the bottom sheet of said pile will be released from said gripping means and independently forced forwardly and buckled, said means consisting of a revolving cushion adapted to impinge upon said bottom sheet to raise the pile bodily, thereby releasing it from said gripping means, and carry

the bottom sheet forward and buckle it, together with means for feeding said buckled sheet from said pile.

7. In a paper-feeding device, the combination of a support for a pile of paper, needle-points adapted to retain said pile in position, a revolving cushion adapted to raise said pile from said needle-points, carry the bottom sheet forward and buckle same, together with a feeding means adapted to feed said buckled sheet from said pile.

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