

May 5, 1925.

1,536,670

L. B. GRASBERGER ET AL

PAPER FEEDING DEVICE

Filed May 15, 1922

Fig. 1.

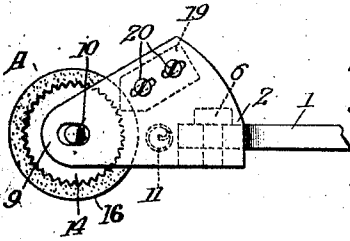


Fig. 2.

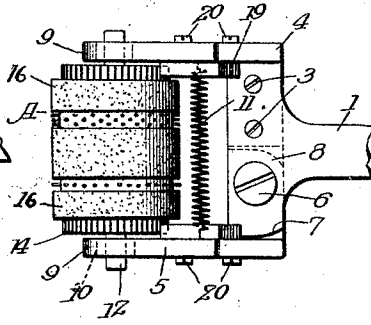


Fig. 3.

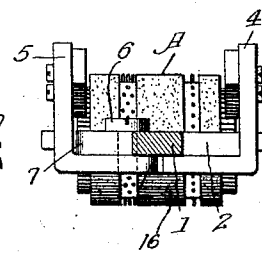


Fig. 4.

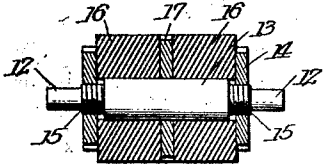


Fig. 5.

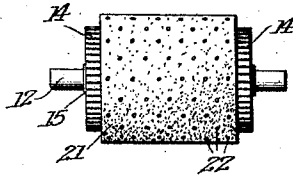


Fig. 6.

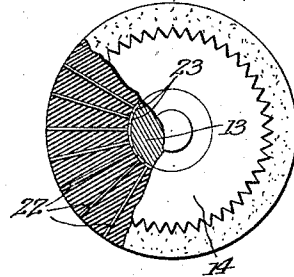


Fig. 7.

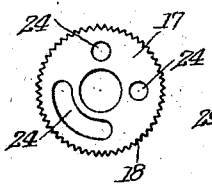


Fig. 9.

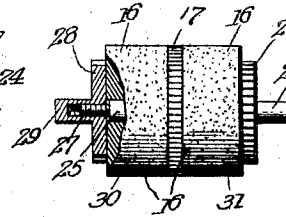


Fig. 8.

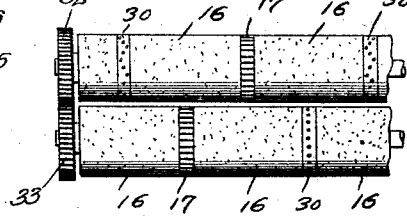


Fig. 10.

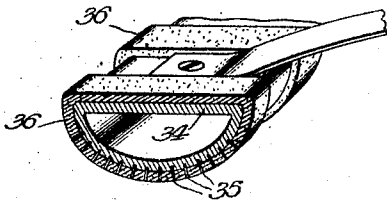
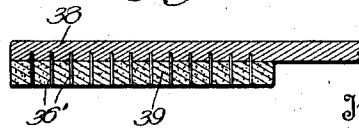


Fig. 11.



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PAPER-FEEDING DEVICE.

Application filed May 15, 1922. Serial No. 561,118.

To all whom it may concern:

Be it known that we, LAWRENCE B. GRASBERGER and JAMES T. FAY, both citizens of the United States of America, of Richmond, county of Henrico, State of Virginia, United States of America, have invented certain new and useful Improvements in Paper-Feeding Devices; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our application relates to feeding devices for paper for printing and other presses and we have found that the principle involved in our Patent No. 1,416,404, May 16, 1922, for feed roller is not only applicable to roller forms of feed devices, but may be applied to various other types of devices, not only for printing presses but for mimeograph, hectograph and other manifold machines.

The present application is therefore, a continuation of our aforesaid co-pending application and its object is a construction in which there is a rigid non-frictional paper feeding element co-acting with a yielding element extending in the same surface as the surface of the non-frictional or positively engaging element, and which upon pressure will yield and allow the rigid element to slightly protrude or extend beyond the surface of the yielding element. The material of which the yielding element is made is preferably a friction material, such as rubber, but may be one that has less frictional action on paper, such as felt, leather, cotton, or any other material that will slightly yield or deform under pressure and resume its original form after the pressure is removed.

Another object of our invention, especially of the roller type, is an improved manner of mounting the rollers, so that they may be easily removed for washing off the ink. Other details of construction and modifications will hereinafter be described with reference to the drawings in which like parts are similarly designated and in which:

Figure 1 is a side view,
Fig. 2 is a plan view, and

Fig. 3 a rear view of a roller construction embodying our invention;

Fig. 4 is a longitudinal central section of a modification of the roller;

Fig. 5 is a further modified construction of roller;

Fig. 6 is an end view of Fig. 5 showing on an enlarged scale the roller partly in cross-section;

Fig. 7 is an elevation of a serrated disc;

Fig. 8 shows two co-operating long paper feed rollers;

Fig. 9 is an elevation of the roller shown in Fig. 4;

Fig. 10 is a perspective view of an arcuate form of feeder partly in section;

Fig. 11 is a section of a flat form of feeder.

All the various forms of feeding devices shown embody a rigid portion or element that positively engages the paper, but does not frictionally feed it, adjacent to the yielding material preferably, but not necessarily rubber, so that the feeding surface upon the application of pressure will allow the rigid portion or element to slightly project or protrude and positively engage the sheet, by slightly biting into the surface. While abraiding material for the rigid element such as an emery wheel or sand stone may do in some instances, it is generally unsuitable because particles of these materials become loosened and fall on the surface to be printed, thus injuring the half tone plates or lithographic stones.

In Figs. 1-4, 1 is the arm of the feeding device commonly used on presses and has a cross head or piece 2. Secured by screws 3 or otherwise to one side of this piece 2 is one of the sides 4 of a roller frame. The other side 5 of the frame is pivoted on a screw 6 to permit this side of be swung out to remove the roller A without the use of any tools. To this end the edge of the cross piece 2 is rounded as shown at 7 and the side piece 5 is rounded as at 8. These two sides 4 and 5 are substantially triangular or sector shaped in form to form a narrow front portion 9 in which is formed a slot 10. The pivoted side 5 is held in operative position by a coil spring 11 extending preferably between the two sides and between the roller and the cross piece 2.

The reduced ends 12 of the shaft 13 of the

roller A has bearing in these slots, and on the shaft are two flanges 14, screwed on to threaded portions 15.

The roller itself is composed of layers or
 5 discs of rubber constituting rings 16 between which is included a metal plate formed as a serrated metal disc 17 preferably of steel. These serrations are preferably triangular or saw toothed as shown
 10 at 18 Fig. 7. The rubber rings or discs 16 and the metal serrated disc 17 easily slip onto the shaft 13 and are compressed, fastened or clamped by screwing the flanges 14 on the threaded portions 15 of shaft 13.
 15 In the particular form shown, the flanges 14 are serrated, and act somewhat as ratchets, there being stationary stops or pawls 19 that co-operate with them. These stops or pawls 19 are preferably adjustable
 20 to and from the flanges 14 by set screws 20. When the roller is moved forward by the arm 1 the teeth of the flanges engage the pawls and are prevented from turning, while when the arm 1 recedes the roller can
 25 move slightly to the front in slots 10, disengage from the pawls and rotate as it is drawn towards its initial position by the arm 1.

In the modified form of roller, Figs. 5 and 6, the roller is shown covered with rubber 21 and small headed brads 22 struck through it. The heads 23 of these brads lie against the surface of the shaft 13 and are supported thereby.

35 In order that the serrated metal disc 17 or one provided with pins as the case may be shall be held firmly between the two rubber rings or discs 16, we cut holes 24 through the disc. These holes are of any suitable
 40 form, or they may be recesses as the maker may elect. When the serrated metal disc 17 and the rubber rings 16 are clamped together by the flanges 14 the sides of the rubber rings 16 squeeze into the holes 24 and
 45 prevent the disc 17 from rotating when heavy pressure has to be applied as in feeding card board, so that the roller turns as a unit, with the discs mutually locked laterally.

50 In Fig. 9 we have shown another construction of roller in which the shaft has secured to it the flange 26 by soldering or otherwise and is provided with a threaded end 27 of reduced diameter. The other
 55 flange 28 has integral with it a stub shaft 29 that is internally threaded and the two parts are screwed together as shown. Between the rubber discs or rings 16 and alternating with them, are metal discs 30 and 31. The former provided with several rows of projecting pins and the latter with a single
 60 row. The ends of the pins are flush with the surface of the roller. No mechanical means are necessary to key the rubber rings
 65 or metal discs on the roller shaft so that

when one or both flanges are removed the rings and discs can be readily slipped off for replacement of worn parts.

In Fig. 8 we have shown two long paper feed rollers between which the paper or
 70 card board is to be fed. These rollers are geared together by gear wheels 32 and 33 one of which gears may be removed when desirable or necessary.

Any of the forms of roller surface shown
 75 in Figs. 4, 5, 6, 8 and 9, may be used for rollers to be mounted in the frame shown in Figs. 1-3 and if one form is not suitable for the work in hand, another form may be quickly substituted and mounted in the
 80 frame.

Fig. 10 shows an arcuate feeder having a hollow metal body 34, in which are set
 85 pins 35 whose ends are flush with the surface of the exterior thick rubber band 36.

In Fig. 11 the body 38 is flat, has the pins 36' set therein. These pins pass through the yielding material 39 which is felt or leather.

In all the various constructions, there are provided a series of metallic points flush
 90 with the surface of the yielding material, whether these points be on a metal disc or pins passing through the rubber, felt or other friction surface.

The arrangement also shows layers of
 95 yielding material alternating with metallic sheets or plates, having points or serrations at their edges, and these points may be formed by a series of pins directly or by pins set in the edge of a plate of metal. The
 100 pins constitute therefore, a form of serration and have the same function and effect as teeth on the edges of the discs.

We claim:

1. A paper feeding device comprising
 105 rigid paper engaging means positively engaging the paper, adjacent yielding means for frictionally engaging the paper and flush with said rigid means and devices compressing said means between them, where-
 110 by when pressure is applied to said device said rigid means may project slightly beyond the surface of said yielding means.

2. A paper feeding device comprising
 115 rigid substantially non-frictional paper engaging means, consisting of a series of metallic points, a yielding material capable of frictionally engaging the paper, said points being substantially flush with the surface of the yielding material and devices for com-
 120 pressing said means between them.

3. A paper feeding device comprising
 125 rigid means, operating to substantially non-frictionally engage the paper surrounded by yielding material operating to frictionally engage the paper, said rigid means arranged to extend beyond the surface of said yielding means when pressure is applied to said device and adjustable devices between which
 130 said means and material are compressed.

4. A paper feeding device, comprising a series of metallic pins, a yielding material the ends of said pins arranged flush with the surface of said yielding material, devices 5 between which said series and material are held, and means to permit altering the pressure of said devices.
5. A paper feeding device comprising layers of rubber alternating with metallic plates having paper engaging points, devices 10 between which said layers and plates are held, and means to permit the distance between said devices to be altered.
6. A paper feeding device comprising layers of rubber alternating with metallic plates and pins set in said plates, the ends of said pins arranged flush with the rubber surface, and actuating wheels between which said layers and plates are held.
7. A paper feeding device, comprising a pair of sides, one of which is pivoted to move with respect to the other and a paper feeding roller journaled in said sides.
8. A paper feeding device, comprising a pair of sides, one of which is pivoted to move with respect to said side, a spring to hold said pivoted side in normal position and a roller journaled in said sides.
9. A paper feeding device, comprising a pair of sides, having bearing slots therein, a paper feed roller journaled in said slots between said sides and having movement therein.
10. A paper feeding device, comprising a pair of sides having bearing slots therein, a roller between said slides and journaled in said slots, a ratchet movable with said roller and a stationary pawl for said ratchet.
11. A paper feeding device, comprising a pair of sides having bearing slots, therein, a roller journaled in said slots, a ratchet movable with said roller and an adjustable stationary ratchet co-operating with said ratchet.
12. In a paper feeding device, a pair of sides, one of which is pivoted to swing with respect to the other a spring to hold the pivoted side in normal position, said sides having bearing slots therein, a feed roller journaled in said slots, a ratchet on said roller and an adjustable stationary pawl co-operating with said ratchet.
13. In a paper feeding device, a roller comprising discs of yielding material, alternating metal discs provided with points, a shaft in which said discs are mounted and a pair of flanges on said shaft between which said discs are clamped.
14. In a paper feeding device, a roller comprising discs of yielding material, metal discs having paper engaging points, a shaft on which said discs are mounted and flanges on said shaft between which said discs are clamped, said flanges constituting ratchets.
15. In a paper feeding device, a roller comprising discs of rubber, alternating metal discs, a shaft on which said discs are mounted, said shaft being threaded to clamp the discs between them.
16. In a paper feeding device, a roller comprising rubber discs, alternating metal discs, pins projecting from the edges of said latter discs whose ends are flush with the rubber surface, a shaft on which the discs are mounted and flanges on said shaft between which said discs are held.
17. In a paper feeding device, a roller comprising alternating discs of metal and of a yielding material, a shaft on which said discs are mounted, means to effect the mutual lateral engagement of the metal and yielding material.
18. In a paper feeding device, a roller comprising alternating discs of metal and rubber, said metal discs having perforations therein for mutual lateral engagement with the rubber to lock them together.

In testimony that we claim the foregoing as our invention, we have signed our names.

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