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W. B. BRONANDER

PAPER FEEDING ROLL

Filed April 7, 1926

Fig. 1.

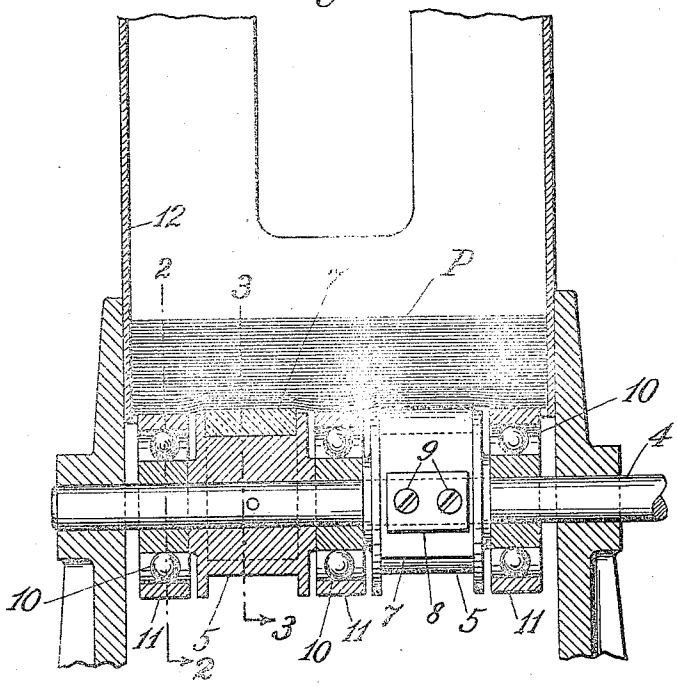


Fig. 2.

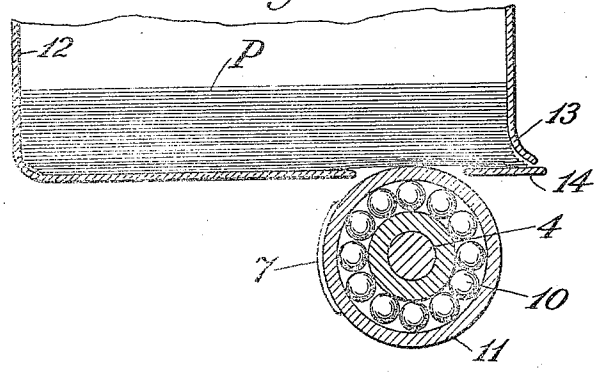
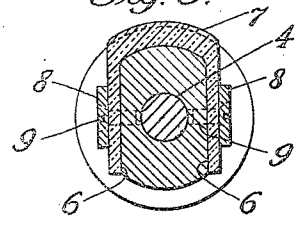


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PAPER-FEEDING ROLL.

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This invention relates to an improvement in a paper feeding roll for successively feeding sheets of paper from a pack.

Paper feeding rolls for this purpose are known and used in machines of many different types for many different purposes, but, in many instances, they occasionally fail to properly feed the sheets from the pack, with the result that the normal operation of the machine is interrupted and machine stoppage becomes necessary in order to remove the cause of the difficulty. It has now been discovered that this difficulty can be overcome by a change in the construction and operation of such rolls, and the main object of the present invention is the production of a roll embodying these changes which properly feeds the sheets from the pack irrespective of the number of sheets therein, and without interruption of the operation of the machine in connection with which it is used, thus eliminating the economic losses heretofore encountered which far outweigh the higher cost of the roll. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations of elements which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, in which like characters of reference indicate the same or like parts, Fig. 1 is a sectional elevation of a roll constructed in accordance with the invention; Fig. 2 is a side cross-sectional elevation of the structure shown in Fig. 1; and Fig. 3 is a detail cross-section of one of the sheet feeding members used in the structure shown in Figs. 1 and 2.

In carrying the invention into effect, there is provided a rotating shaft, means carried and rotated by said shaft and intermittently engaging a pack of sheets of paper to successively feed sheets from said pack, and means also carried by said shaft in constant engagement with said pack, there being always a tendency for said second means to feed a sheet from said pack, this tendency being overcome by the frictional engagement of the sheet to be fed with the remainder of the pack until the first means comes into action and overcomes the resistance of this frictional engagement. In the best constructions contemplated, the two means are alternately arranged on the shaft, the number being dependent upon the width of the sheets to be fed. These means may be varied in construction within the scope of the claims, for the specific structure selected to illustrate the invention is but one of numerous possible concrete embodiments of the same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

Referring to the drawings, 4 indicates a rotating shaft deriving its motion from one of the driving shafts of the machine in connection with which the roll is used. Fast on the shaft 4 are a number of drums 5, spaced apart and each having oppositely-disposed flattened surfaces 6. To these flattened surfaces are clamped the ends of a rubber pad 7, by means of the clamps 8 secured to the drums by screws 9. As the shaft 4 rotates, the pads 7 are caused to intermittently engage the pack of sheets, marked P, and to successively feed sheets therefrom.

Alternately arranged with the drums 5, along the shaft 4, are ball bearings 10, the inner races of which are pressed on the shaft to rotate with it, while their outer races 11 are in constant engagement with the pack and rotate only when the sheet fed out by the pads 7 is moving.

For the purpose of supporting the pack of sheets, there is provided a vertical magazine 12 in which the sheets are stacked one above another; and this magazine is provided with a front wall 13 the lower end of which is spaced from the magazine floor 14 a sufficient distance to permit the passage between the two of a single sheet only as it is fed out by the pads 7.

As the sheet passes out between the front wall 13 and floor 14 of the magazine, its leading edge may be caught by means such as feed rolls which complete the operation of withdrawing the sheet from the pack. Such feed rolls are of well known construction and operation and form no part of the present invention. For this reason, description and illustration of the same is omitted in the interest of brevity and clearness.

As hereinbefore intimated, there is a constant tendency of the outer ball races to feed out a sheet from the pack, but this tendency is overcome by the frictional engagement of the lowermost sheet with the pack resting on it so long as the pads 7 are out of contact with said lowermost sheet; and during this

period the outer races 11 stand still. When the pads 7 come into engagement with the lowermost sheet, however, their frictional engagement therewith overcomes the frictional resistance of the pack thereon, and the sheet moves out from under the pack. During this period, the outer races 11 of the ball bearings move along with the sheet and slightly aid the pads 7.

The secret of the success of the roll appears to reside in the tendency of the outer races 11 of the ball bearings to maintain a slight feeding strain on the sheet to be fed while the positively-feeding pads are out of engagement therewith, so that the frictional inertia is more easily overcome and the sheet started on its way, for any of the older feed rolls would ordinarily feed out a sheet once started, though they sometimes failed to start it.

What is claimed is:

1. A roll for successively feeding sheets of paper from a pack, comprising a rotating shaft, means carried and rotated by said shaft and intermittently engaging said pack to successively feed sheets therefrom, and ball bearings carried by said shaft with their outer races in constant engagement with said pack and constantly exerting a slight feeding strain on the sheet to be fed out.

2. A roll for successively feeding sheets of paper from a pack, comprising a rotating shaft, means carried and rotated by said shaft including supporting means fast on said shaft and sheet engaging means fast on said supporting means and intermittently engaging said pack to successively feed sheets therefrom, and means carried by said shaft in constant engagement with said pack and constantly exerting a slight feeding strain on the sheet to be fed out.

3. A roll for successively feeding sheets of paper from a pack, comprising a rotating shaft, supporting drums having flattened surfaces and carried and rotated by said shaft, rubber pads carried by said drums and clamped to said surfaces and intermittently engaging said pack to successively feed sheets therefrom, and means carried by said shaft in constant engagement with said pack and constantly exerting a slight feeding strain on the sheet to be fed out.

4. A roll for successively feeding sheets of paper from a pack, comprising a rotating shaft, supporting drums having flattened surfaces and carried and rotated by said shaft, rubber pads carried by said drums and clamped to said surfaces and intermittently engaging said pack to successively feed sheets therefrom, and ball bearings carried by said shaft with their outer races in constant engagement with said pack and constantly exerting a slight feeding strain on the sheet to be fed out, said pads and bearings being alternately arranged on said shaft.

In testimony whereof, I have signed my name to this specification.

WILHELM B. BRONANDER.