No. 656,593. Patented Aug. 21, 1900.

# H. BILGRAM.

## FEED ROLLS FOR PAPER FEEDING MACHINES.

(Application filed Dec. 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

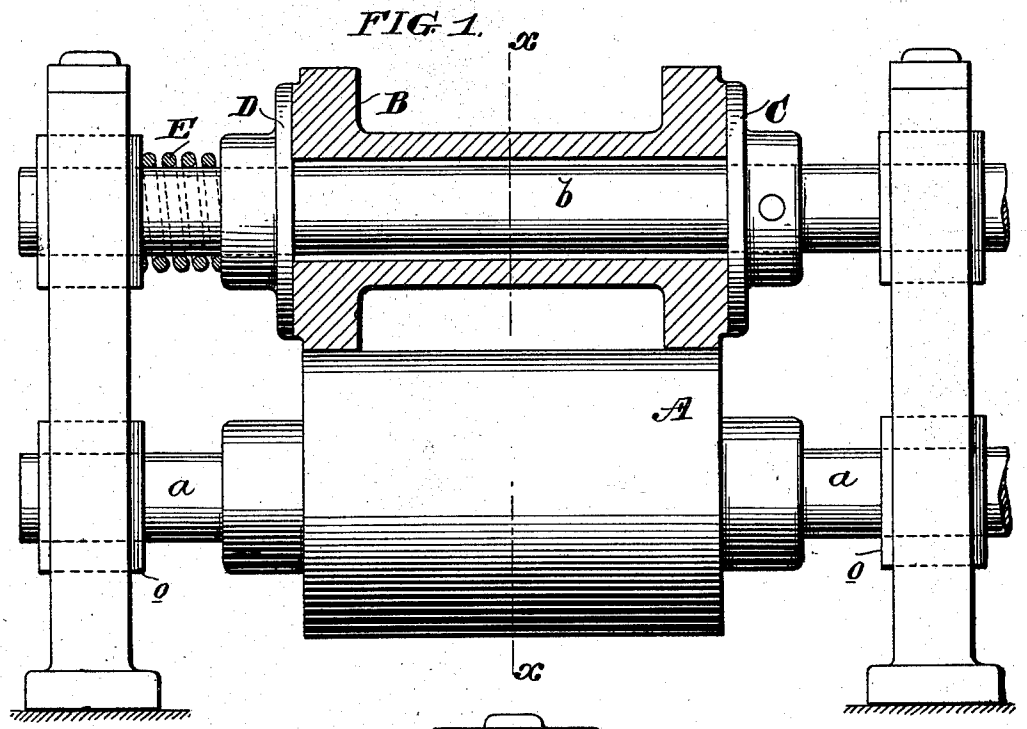
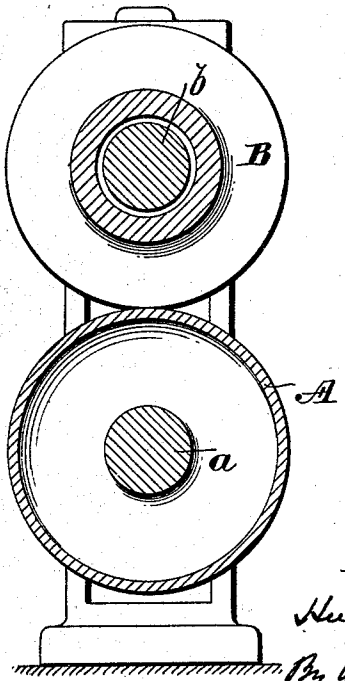



FIG. 2.




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(No Model.) 2 Sheets—Sheet 2.

FIG. 3.

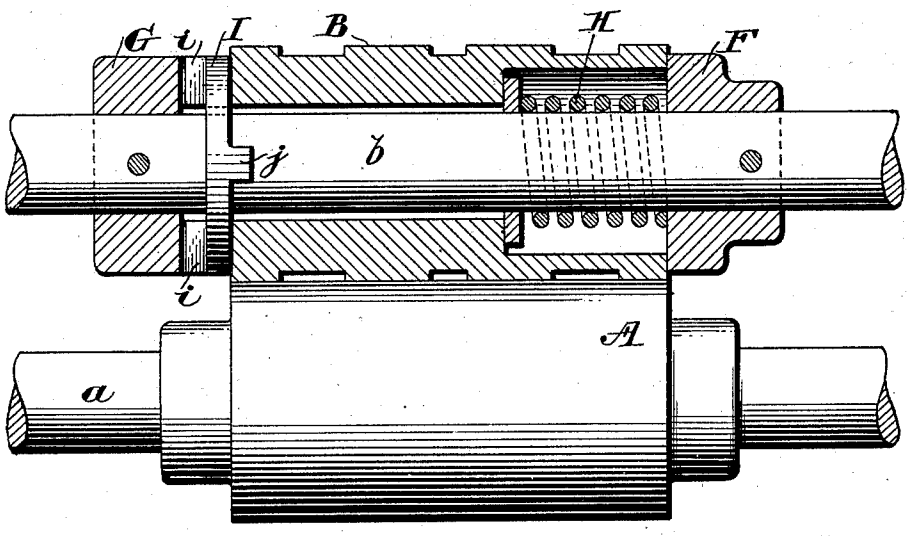



FIG. 4.

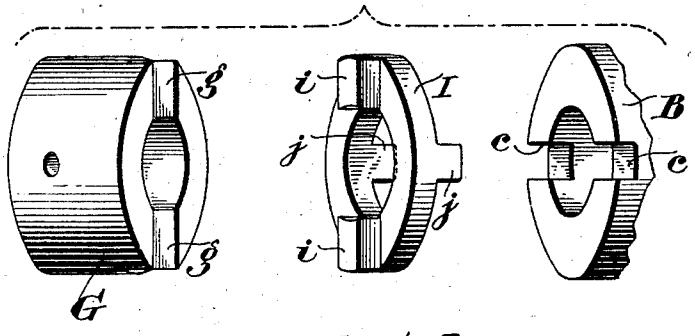
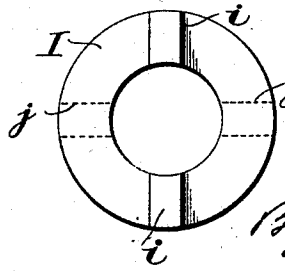



FIG. 5.




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# UNITED STATES PATENT OFFICE.

HUGO BILGRAM, OF PHILADELPHIA, PENNSYLVANIA.

## FEED-ROLLS FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 656,593, dated August 21, 1900.

Application filed December 22, 1899. Serial No. 741,215. (No model.)

*To all whom it may concern:*

Be it known that I, HUGO BILGRAM, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Feeding-Rolls for Paper-Feeding Machines, &c., of which the following is a specification.

My invention relates to feed-rolls for paper-feeding machines, &c.; and it consists of the improvements which are fully set forth in the following specification and are shown in the accompanying drawings.

In feed-rolls for feeding paper, &c., it is desirable that one or both of the rolls shall have freedom to yield or automatically adjust itself to suit variation in the thickness of the paper or material being fed or inequalities therein. This has usually been effected by mounting the roll-shaft in adjustable or yielding bearings. With such a construction any movement in the rolls is accompanied by a corresponding movement of the roll-shaft and parts carried by it. Such a movement is often objectionable, as affecting the driving connections and for other reasons.

It is the object of my invention to enable the roll to yield or automatically adjust itself independently of its shaft, thus enabling the shaft to remain stationary. To this end I arrange the roll loose upon the shaft, with provision for slight transverse movement with reference thereto and employ a yielding frictional connection between the roll and shaft, which permits the roll to yield or move transversely on its shaft whenever the force applied to it in a radial direction exceeds the frictional pressure of such connection.

In the accompanying drawings, Figure 1 is an elevation of paper-feed rolls embodying my invention, with the upper feed-roll in section. Fig. 2 is a transverse vertical sectional view in the line *x x* of Fig. 1. Fig. 3 is a view similar to Fig. 1, illustrating a modification. Fig. 4 is a perspective view of detached parts of the upper feed-rolls of Fig. 3, and Fig. 5 is a plan view of the intermediate washer shown in Fig. 4.

A B are feed-rolls, of which one, as A, may be carried fast upon its shaft *a*, which is journaled in suitable bearings *o*. The other feed-roll B is carried on its shaft *b* by a frictional or yielding connection, with provision for transverse movement with respect to the shaft. For this purpose the feed-roll has an internal bore larger than the diameter of the shaft, so as to fit loosely thereon with freedom of slight transverse movement and is held on the shaft through a suitable yielding connection.

Referring first to the construction shown in Figs. 1 and 2, the roll B is held between the fast disk C and the loose disk D on the shaft *b*, with a spring E bearing on the disk D and thrusting it upon the end of the roll. By these means the roll is held in driving connection with the shaft *b*, but may move laterally between the disks C and D to a slight extent permitted by the difference between the diameters of the bore of the roll and the shaft. The roll B being then in an eccentric position in its shaft *b* the rotation will have a tendency to pass the roll against the roll A, and thus grip the paper to be fed.

As it is objectionable in some cases if the roller is free to rotate upon its shaft, I have devised a construction to prevent this while permitting the transverse movement. Referring to this construction, (shown in Figs. 3, 4, and 5,) F G are disks fast upon a shaft *b*, and H is a spring between one of the disks, as F, and the roll, acting to thrust the roll forward toward the opposite disk G. I is a washer interposed between the disk G and the end of the roll B, which is provided with lugs *i* and *j*, respectively engaging radial notches *g* and *c* in the disk G and roll B. These lugs *i* and *j* and the corresponding notches are arranged at substantially right angles to one another, thus permitting the roll B to move transversely upon its shaft *b* in any direction without being subjected to any rotary slip with relation to said shaft *b*. Obviously the arrangement of either or both lugs *i j* and notches *g c* may be reversed, the lugs being arranged on the disk and the roll and the notches on the washer.

The details of construction shown may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In feeding-rolls for paper-feeding machines, &c., the combination with the roll-shaft, of a roll fitting loosely thereon with provision for transverse movement with ref-

erence thereto, and a yielding frictional connection between the end faces of said roll and its shaft, whereby the roll may move or yield transversely with respect to its shaft and said frictional action.

2. In feeding-rolls for paper-feeding machines, &c., the combination with a roll-shaft, of a roll having an internal bore of a greater diameter than the diameter of the roll-shaft and a yielding connection between the end faces of said roll and the roll-shaft.

3. In feeding-rolls for paper-feeding machines, &c., the combination with a roll-shaft, of a roll having an internal bore of greater diameter than the diameter of the roll-shaft, clamping-disks carried by the roll-shaft in frictional contact with said roll, and a spring acting on one of the said disks and holding it in yielding frictional contact with the roll.

4. In feeding-rolls for paper-feeding machines, &c., the combination of a roll-shaft, a roll fitting loosely thereon with provision for transverse movement with reference thereto, and a yielding disk held in frictional contact with an end face of said roll and forming a yielding frictional connection between the roll and shaft with provision for transverse movement of the roll with respect to its shaft.

5. In feeding-rolls for paper-feeding machines, &c., the combination of a roll-shaft, clamping-disks carried by said shaft, a roll fitting loosely on said shaft between said clamping-disks with provision for transverse movement with respect to its shaft between said disks, and means to hold said disks in yielding frictional contact with the end faces of said roll.

In testimony of which invention I hereunto set my hand.

HUGO BILGRAM.

Witnesses:
ISAAC THOMPSON,
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