

UNITED STATES PATENT OFFICE.

WENTWORTH G. TREVETTE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO LUCIUS W. WINCHESTER, OF SAME PLACE.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 575,744, dated January 26, 1897.

Application filed January 25, 1896. Serial No. 576,848. (No model.)

To all whom it may concern:

Be it known that I, WENTWORTH G. TREVETTE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My present invention relates to certain new and useful improvements in paper-feeding machines, and is adapted for use more particularly in connection with that type of machine which is perhaps best illustrated in an application filed by me bearing Serial No. 572,581, and in which I claim, broadly, the invention therein disclosed.

The primary object of the present invention is to deliver a sheet of paper from the machine in a perfectly smooth and unwrinkled condition, so that it may be folded or otherwise disposed of without being disfigured by creases or the like; and a further object of the invention is to construct those parts of the machine which contact directly with a sheet of paper, while the same is being advanced, of such material that the advancement of the upper sheet will be facilitated, while any tendency of the sheets below the upper sheet to advance will be retarded.

With these and other ends in view my invention consists of the particular construction and arrangement of parts and combination of devices hereinafter described, and illustrated in the accompanying drawings, referring to which—

Figure 1 is a sectional view showing the location of the advancing means at or about the beginning of its downward and forward movement. Fig. 2 is a top plan view of the gripper rock-shaft and the delivery-roll shaft and the arm and roller carried by said gripper rock-shaft. Fig. 3 is an enlarged detail view showing the manner of supporting the roller on the gripper rock-shaft. Fig. 4 is a detail view of the delivery-roll and the roller supported on the gripper rock-shaft. Fig. 5 is a bottom plan view of the advancing slide-plate, and Fig. 6 is a top plan view of the

main and supplemental separators, with their immediate connections.

I will now proceed to a detail description of my present invention as it is embodied in the type of machine described in my aforementioned application, but it will be distinctly understood that these improvements are in no wise limited or restricted in their application to the particular machine herein referred to, for it is obvious that they may be embodied in the construction of machines of an entirely different type, wherein they will accomplish exactly the same results in a substantially similar manner.

In Fig. 1 of the drawings I have shown that portion of the machine with which my improvements are connected, and it will be unnecessary herein to refer to the general construction of a paper-feeding machine except in so far as it is essential to point out the connections for these improvements.

The advancing devices comprise an advancing-plate G, which is adapted to slide in the hangers D' on the bracket D, which bracket is carried on a supporting-rod d, suitably arranged in the frame of the machine. A spring-bar g is secured to the upper side of the advancing-plate and provided with a projection g' on its lower side. An arm H is rigidly secured on a rock-shaft C, supported on the frame of the machine, and a pusher-rod h is pivotally secured to the lower end of this arm, and has its forward end arranged beneath the spring g and normally in engagement with the projection g', whereby the plate G will be advanced as the shaft C is rocked. A rack h' is arranged on the upper side of the advancing-plate, and it is adapted to be engaged by a pawl I when the tripper i is operated, as hereinafter described, by the advancing sheet of paper. On the lower face of the slide-plate G is a facing J, of soft rubber or some other material of a similar nature, which is adapted to contact directly with the top sheet of paper and carry it forward as the advancing means are moved. The tripper i is rigidly secured, together with the pawl I, on the shaft i', supported on the bracket D, and it projects slightly below the face of the rubber facing J, so that the sheet of paper, moving forward,

will engage the end of the tripper, thereby rocking the shaft v' and causing the pawl I to engage the rack h' . The forward movement of the advancing means is thereby limited, but the pusher-rod still continues moving forward and in so doing forces its way beneath the projection g' , at or about which time the advancing means are being elevated preparatory to returning into position for operating upon the sheet of paper which is now on top of the pile W.

On the rear end of the advancing slide-plate G a pusher-finger K is pivotally secured, and it carries on its lower end a rubber contact k , which is adapted to engage the top sheet of paper and comb the sheets forward. The pusher-finger is provided with an upwardly-extending hooked arm k' , and a spring L is arranged to engage the hooked arm and normally hold the contact down and in close contact with the paper when the advancing means are in operation. The pin k'' engages the advancing slide-plate when the latter is raised, so that the plate will carry the pusher-finger up with it and the contact away from the paper. The spring L is supported upon an arm l , and its tension is maintained by means of an adjusting-screw l' .

A kicker M is pivotally supported on the forward end of an arm m , which arm is rigidly secured on the kicker rock-shaft m' , suitably supported in the frame of the machine and adapted to be operated to cause the kicker to rise beneath the forward ends of the sheets of paper which have been more or less advanced by the means employed to advance the top sheet and loosen them slightly from contact with the other sheets, also preventing said sheets from becoming jammed against the main separator, as fully described in my other application referred to.

The main separator comprises a block O, provided with a hard-rubber covering o' . A supplemental separator R is also located adjacent to the main separator, and it preferably comprises a hard-rubber block. These separators are preferably mounted upon suitable yielding devices, whereby they are adapted to maintain their proper position throughout the cycle of operation of the machine.

I have found that particularly satisfactory results will be obtained by the use of a soft-rubber facing J and a hard-rubber covering o' for the main separator, it being understood that for all ordinary purposes the main separator O will be amply sufficient. Owing to the fact that the sheets of paper are usually packed very closely together and have the ordinary friction it will be found that some of the sheets immediately below the top sheet will also be advanced a more or less distance by the pusher-finger K when the top sheet is advanced, and these upper sheets will be retarded in their forward movement by coming in contact with the hard-rubber covering of the main separator. When the facing J, of

soft rubber, on the advancing slide-plate comes in contact with the top sheet and moves forward with the advancing means, the top sheet will sink slightly into the soft-rubber facing J, whereby this facing and top sheet will pass easily over the separator without being retarded thereby in any way, but the under sheets will engage the covering of the separator and be prevented from moving forward. By thus becoming embedded in the soft-rubber facing J the top sheet forms substantially a continuous smooth surface with that portion of the facing against which the sheet does not contact, so that the facing and top sheet will slide over the separator without the top sheet offering any resistance thereto, while the under sheet will engage the rubber covering for the separator and remain in their position against the same without moving forward.

The gripper rock-shaft T is supported in the forward part of the frame, and it is rocked by suitable cam devices with the main shaft of the machine, as fully described in my other application before mentioned, or in any other suitable manner. A collar t is secured on this gripper rock-shaft, and it is provided with a projecting arm t' on one side thereof, to which a plate X is adjustably secured by means of suitable screws or bolts x . This plate X is provided with slots x' , through which the bolts x pass, and by means of which the said plates may be angularly disposed with reference to the rollers V. The roller u is journaled in suitable bearings in said plate, and it is adapted to be moved into contact with the delivery-roll V as the shaft T is rocked. The delivery-roll V is carried upon a delivery-roll shaft v , suitably supported on the machine in a fixed position, and this roller is provided with a rubber covering v' . Any number of these delivery-rolls may be employed, and in Fig. 2 I have illustrated four sets of rollers, but it is obvious that more or less should be employed, according to the size of the paper operated upon.

It is frequently found that in advancing the top sheet of a pile of paper one side thereof will engage the tripping devices before the other side, and consequently as the paper is delivered to the mechanism it will be crumpled and afterward creased and otherwise disfigured in the folding or other machines. This is objectionable for many reasons, which it is unnecessary to refer to, and to avoid the crumpling of the paper and deliver it from the machine in a perfectly flat and smooth condition I set the rollers u at an angle to the direction of the shaft T, so that the paper will be drawn substantially in opposite directions at an angle to its forward movement into a taut or tightened position, thereby effectually smoothing out whatever wrinkles or folds there may be in the paper and delivering it from the machine in proper condition.

Where four sets of delivery-rolls are em-

ployed, as illustrated in Fig. 2 of the drawings, the rollers *u* of one or both sets on each side of the middle of the machine are adjusted to operate in different directions, so that the paper passing between the rollers *u* and *V* will in effect be drawn sidewise in opposite directions into a taut position, and whatever wrinkles there may have been will be effectually removed.

In some cases it will not be necessary to adjust all of the rollers *u* of the machine into an angular position, for where four sets of delivery-rollers are employed the rollers *u* of the outer sets only may be inclined to accomplish the same result. The sidewise pull or tension effected by the inclined position of the roller *u* is not sufficient to tear the paper; but to effectually prevent such a result the rollers *u* are preferably covered with rubber, so that they will grasp the paper, together with the rubber-covered rollers *V*, lightly and softly, after the manner in which a piece of paper would be grasped between the thumb and finger. It will be understood in the foregoing description that a delivery-roller *V* and its companion roller *u* constitute what I have designated as a "set" of delivery-rollers.

It will be observed that the lower separator, although vertically movable, is stationary with relation to the plane of movement or direction of movement of the sheets of paper. In other words, the separator has no backward and forward movement, rotary movement, or any other movement in line with the moving sheet of paper.

I am aware that changes in the form and proportion of parts and details of construction of my invention may be made without departing from the spirit and without sacrificing the advantages thereof, and I would therefore have it understood that I reserve the right to make all such changes as fairly fall within the scope and spirit of my invention.

Having thus fully described my invention,

what I claim, and desire to secure by Letters Patent, is—

1. In a paper-feeding machine, the combination with a stationary separator having a hard-rubber covering, of a plate adapted to be brought down into contact with the top sheet of paper and moved forward to advance said top sheet through the machine, and provided with a soft-rubber facing, substantially as described.

2. In a paper-feeding machine, the combination of a stationary separator provided with a hard-rubber covering, and means for advancing the top sheet of paper having a soft-rubber contact-face adapted to engage the top sheet of paper, substantially as described.

3. In a paper-feeding machine, the combination with a separator provided with a hard-rubber face, of advancing means having a soft-rubber contact-face adapted to be brought down into engagement with the top sheet of paper and operating in a plane parallel with the separator to advance said top sheet through the machine, substantially as described.

4. In a paper-feeding machine, the combination of a stationary separator provided with a hard-rubber face and advancing means adapted to reciprocate back and forth in different planes parallel with the separator and having a soft-rubber contact-face to engage the top sheet of paper, substantially as described.

5. In a paper-feeding machine, the combination of a substantially stationary separator provided with a hard-rubber face and horizontally-reciprocating means for advancing the top sheet of paper, said means being provided with a soft-rubber contact-face to engage the top sheet, substantially as described.

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Witnesses:

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