F. J. GUBELMAN.

ANTICURLING DEVICE FOR PAPER SHEETS.

APPLICATION FILED JAN. 7, 1916.

1,210,465.

Patented Jan. 2, 1917.

2 SHEETS—SHEET 1.

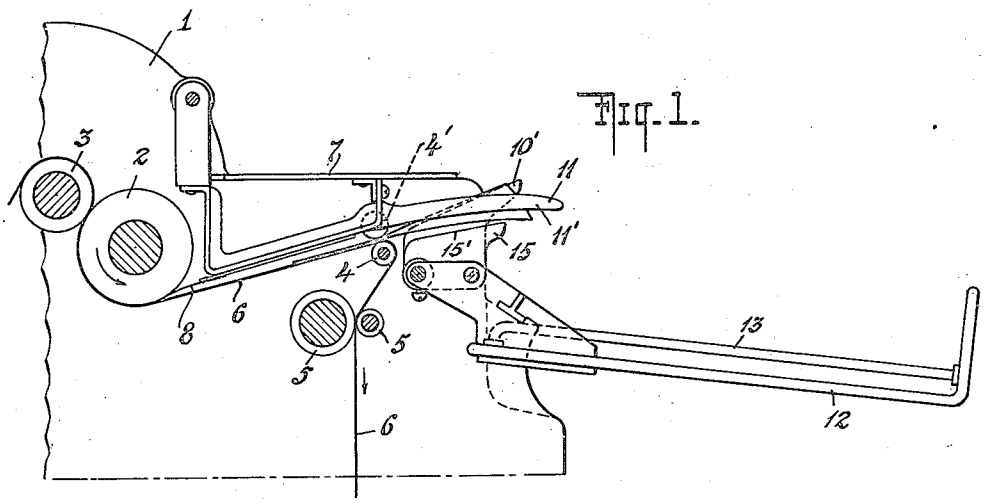


Fig. 1.

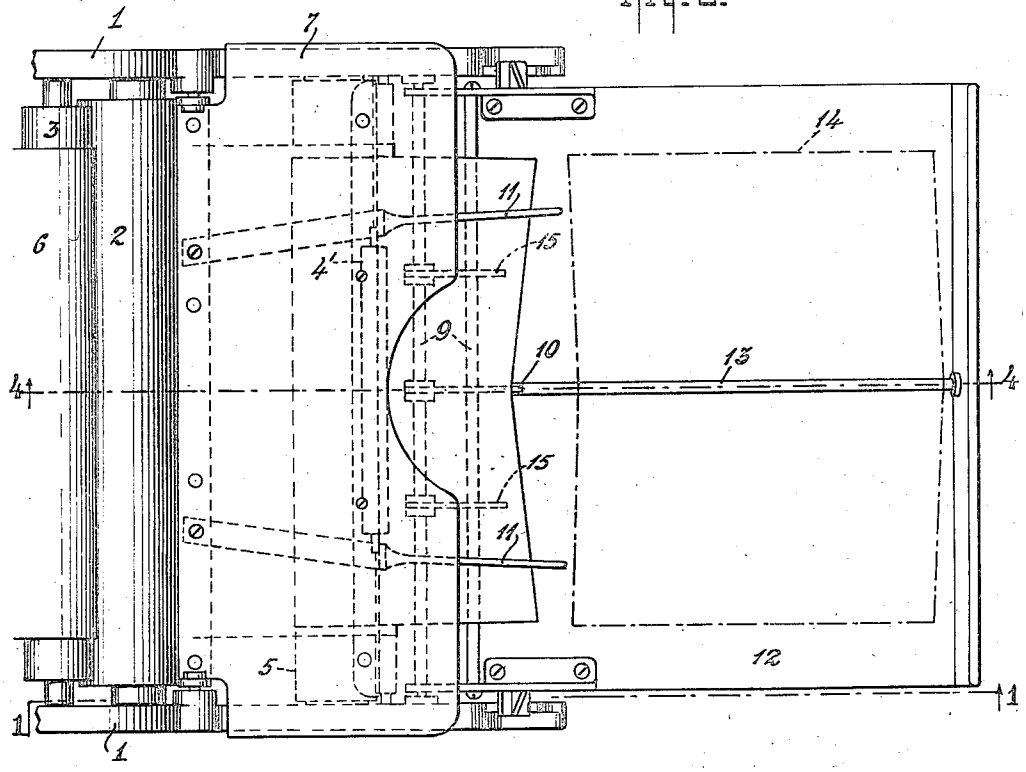


Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

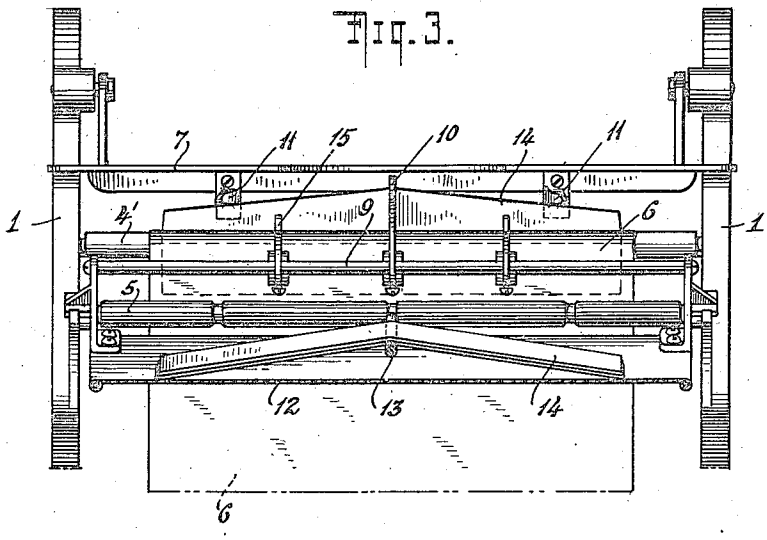
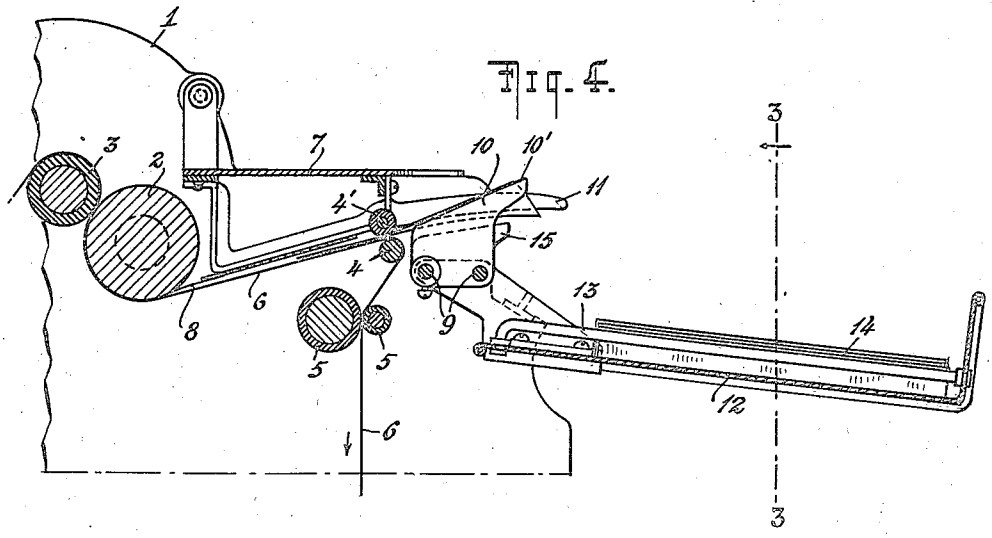


Fig. 4.



WITNESSES

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ANTICURLING DEVICE FOR PAPER SHEETS.

1,210,465. Specification of Letters Patent. Patented Jan. 2, 1917.

Application filed January 7, 1916. Serial No. 70,721.

To all whom it may concern:

Be it known that I, FREDERICK J. GUBELMAN, a citizen of the United States, residing at Englewood, county of Bergen, State of New Jersey, have invented a certain new and useful Improvement in Anticurling Devices for Paper Sheets, of which the following is a specification.

My invention relates to an anti-curling device for paper sheets and the like and has for its object to correct or neutralize any tendency which such sheets may have, as they are delivered from a copying or printing press, or similar instrumentality, to curl in a fixed direction, either upwardly or downwardly.

More particularly my invention relates to a device, of the character specified, for use with rotary copying machines in which letters or the like are successively copied by being pressed against, while being passed around, a copying roll or cylinder in contact with a suitable copy paper, the letter or copy paper, or both, being moistened; the letters after they have been copied, are fed from the machine and are then filed or mailed as the case may be.

Copying machines, as just described, find their principal use in establishments and offices having a very considerable amount of copying to do at one time. The letters, after being copied, are therefore, likely to be fed from the machine in rapid succession. Owing to the fact that the letter, while moist, has passed over or around a roller it will ordinarily acquire a permanent set or curvature in the same direction as that of the roller. As each letter is delivered from the machine, therefore, upon the receiving tray, it will require to be smoothed and flattened by hand if successive letters are to follow into place uniformly and with regularity and to stack one upon the other. This operation is tedious and annoying and either requires the services of an extra operator, or requires that the machine be run more slowly if the work of feeding the letters to the machine and seeing that they are properly stacked upon their delivery from the machine is to be performed by a single operator.

By my invention herein described I avoid the just mentioned disadvantage and deliver the sheets to the receiving tray in a substantially flat condition by imparting to each copied letter after it passes from the copying roll a bend or curvature in a direction opposite to the curvature to be corrected and about a central line at right angles to the axis of the copying roll; *i. e.*, at right angles to the line about which the curvature caused by the copying roll takes place and in the opposite direction.

Briefly described, my invention resides in arranging a set of guides in front of the copying roll and at right angles thereto by means of which the ends of the letter, as compared with its central part, are pushed in a direction such as to establish a curvature opposite to the curvature of the letter which has been produced by the copying roll.

My invention will be better understood by referring to the accompanying drawings in which—

Figure 1 represents a side elevation, part section, taken along the line 1—1 of Fig. 2, of so much of the machine as is necessary for an understanding of the invention; Fig. 2 is a plan view of Fig. 1; Fig. 3 is a front elevation, taken from the plane 3—3 of Fig. 4; and Fig. 4 is a section taken along the line 4—4 of Fig. 2.

The drawings represent part of a rotary copying machine, including the copying roll, the delivery means, and the receiving tray, as employed with a preferred form of my anti-curling device.

In the drawings the two side frames 1—1 have bearings formed therein for the copying roll 2, the pressure roll 3, the guide roll 4 and the feed rolls 5. These rolls are connected by gearing (not shown) so as to be rotated either by hand or by motor in the usual way.

The copy paper 6 is fed from a continuous roll (not shown) to and over pressure roll 3 and downwardly between said pressure roll and copying roll 2, thence over and around the guide roll 4, being pressed thereupon by auxiliary roll 4'; and downwardly between the feed rolls 5—5.

A feed table 7 is supported by the frame of the machine, forwardly of the copying roll 2, and at such height that a letter placed thereon and pushed to the rear will slip naturally between the two rolls 2 and 3 and so as to be carried downwardly and forwardly between the copy paper 6 and copying roll 2. To the lower side of the feed table is fastened a thin transverse strip 8 the inner

free edge of which bears lightly against the copying roll just above the point at which the copy paper leaves said roll.

Fixed centrally upon a pair of transverse rods 9, supported by the (removable) receiving tray 12 is a bending guide 10, of thin metal, the upper straight edge 10′ of which slopes outwardly and upwardly with respect to the plane of the copy paper as established between the copy roll 2 and guide roll 4. Laterally on each side of guide 10, and at a distance therefrom preferably a little less than half the length of the letter which is being copied, is another bending guide or arm 11 supported from the under side of the feed tray and parallel with guide 10. The inner ends of each lower edge 11′ of these lateral guides lie substantially in line horizontally with the inner end of edge 10′ of guide 10 and each of said lower edges slopes outwardly and upwardly in a plane substantially parallel to the plane of the copy paper and very close thereto. The lower edges 11′ project somewhat farther forward than does the edge 10′ and the outer ends of all the edges extend over the inner side of receiving tray 12. This tray slopes slightly downwardly and forwardly.

A rod 13, in the same vertical plane as central guide 10, is supported by the receiving tray just above its receiving surface and parallel thereto.

The operation of my invention is as follows: The mechanism being started, the copy paper 6 advances continuously in the direction of the arrows. Each letter 14, after being laid face upwardly upon the receiving table 7 and pushed back until it is gripped between the copying roll 2 and pressure roll 3, is carried downwardly and forwardly, being held in position against the copying roll 2 by the copy paper 6. As the letter passes under the pressure roller 3 the matter typed or written thereon is copied upon the copy paper 6 in the usual way. As the forward edge of the letter reaches the point where the copy paper leaves the copying roller 2 in its progress toward the guide roll 4 the edge of strip 8 which, as heretofore stated, is in contact with copying roll 2 will insert itself between the letter and the copying roll so as to prevent their sticking together. The forward edge of the letter will, therefore, slip under strip 8 and be carried forward upon the copy paper 6 and over the guide roll 4. At this point the forwardly moving edge of the letter will begin to engage the central edge 10′ and the lateral edges 11′. As the letter continues to move forward the ends thereof will be pressed downwardly by the edges 11′ while the central part will be pressed upwardly by the edge 10′. A downward bend or curvature of the letter about its central transverse portion will thus have been produced and this bend will be opposite in direction and about a line at right angles to the curvature which would naturally be produced in the letter by the action of copying roll 2. The letter, having passed from between guide roll 4 and auxiliary roll 4′, will lie and be held in its described bent position by the edges 10′ and 11′ until the next successive copied letter pushes it forwardly. It will then fall upon the receiving tray and slide downwardly thereon where its central part will be elevated by the rod 13 and its ends rest upon the surface of the receiving tray, thus maintaining the letter in substantially the same form as was given it by the guides 10 and 11.

While I prefer to use the supporting rod 13 as just described, it is, nevertheless, not essential to the securing of the beneficial results of my invention, broadly regarded, and may be modified or omitted if desired.

While in the machine shown the letter receives an upward curvature by reason of the copying roll over which it passes, therefore, requiring that the arms 10 and 11 give it a downward curvature, my invention is equally applicable to a machine in which the letter might be delivered forwardly and over a copying roll, thereby giving said letter a downward curvature. In such case the positions of the central and lateral guides respectively, would merely be reversed.

In some cases, as when the letter or other document being copied is on very light or thin material, the ends may droop sufficiently, after bending by the edges 10′ and 11′, as just described, to cause the forwardly moving edges of the letter, as it falls upon the receiving tray 12, to engage with the rear edges of the letters already stacked upon said tray. To avoid this, I mount, upon the same rods which support the guide 10, a pair of auxiliary guides 15 having upper edges 15′. These guides are placed symmetrically on each side of central guide 10 and not quite as far therefrom as the lateral guides 11. The upper edges 15′ lie in a plane substantially parallel to the plane of edges 11′, but somewhat below said plane, and prevent too great a drop of the ends of the letter as it is bent by the edges 10′ and 11′ before the forwardly moving edge of the letter has been pushed forwardly of the rear line of the letters already stacked upon the receiving tray.

Having described my invention, I claim:

1. In a press, in combination with a roll around and from which a letter is adapted to be delivered, a plurality of guides adapted to receive the letter located in front of said roll and projecting at right angles thereto, one of said guides being disposed to engage the central part of the letter upon one surface thereof while others of said guides are disposed to engage the ends of the letter on the opposite surface thereof, the engaging parts of the end guides being in a different

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