E. E. STRAWN.

PAPER HANDLING DEVICE.

APPLICATION FILED OCT. 28, 1919.

1,355,364. **Patented Oct. 12, 1920.**

3 SHEETS—SHEET 1.

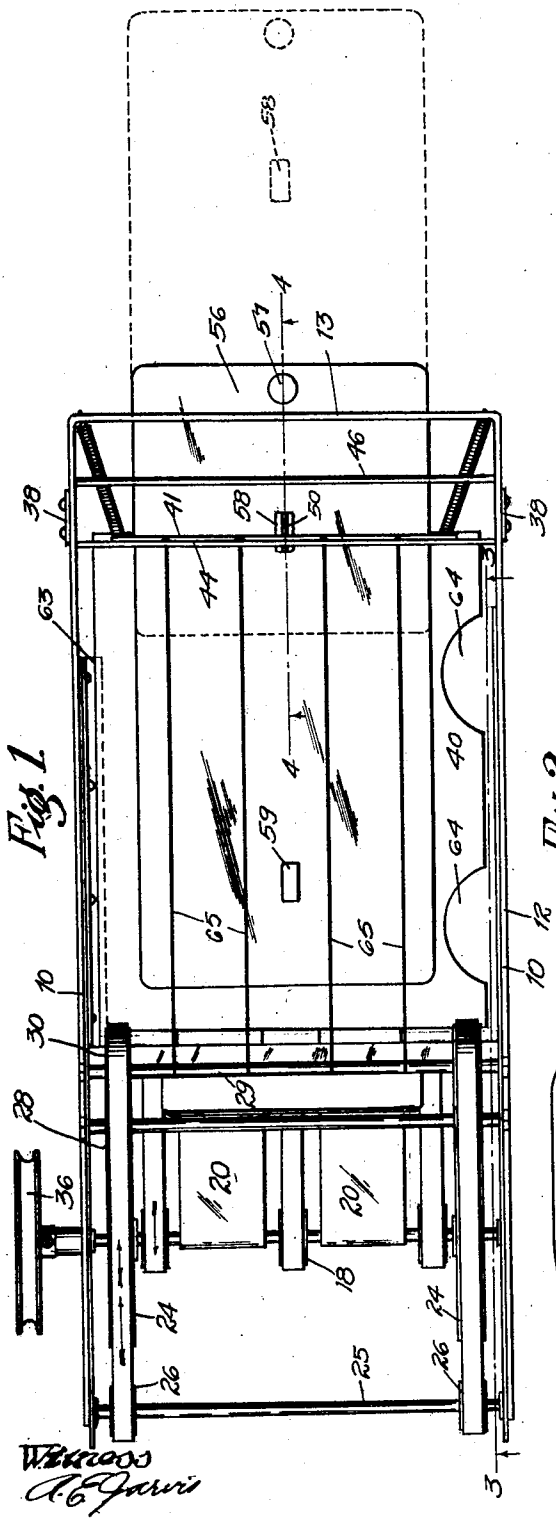


Fig. 1

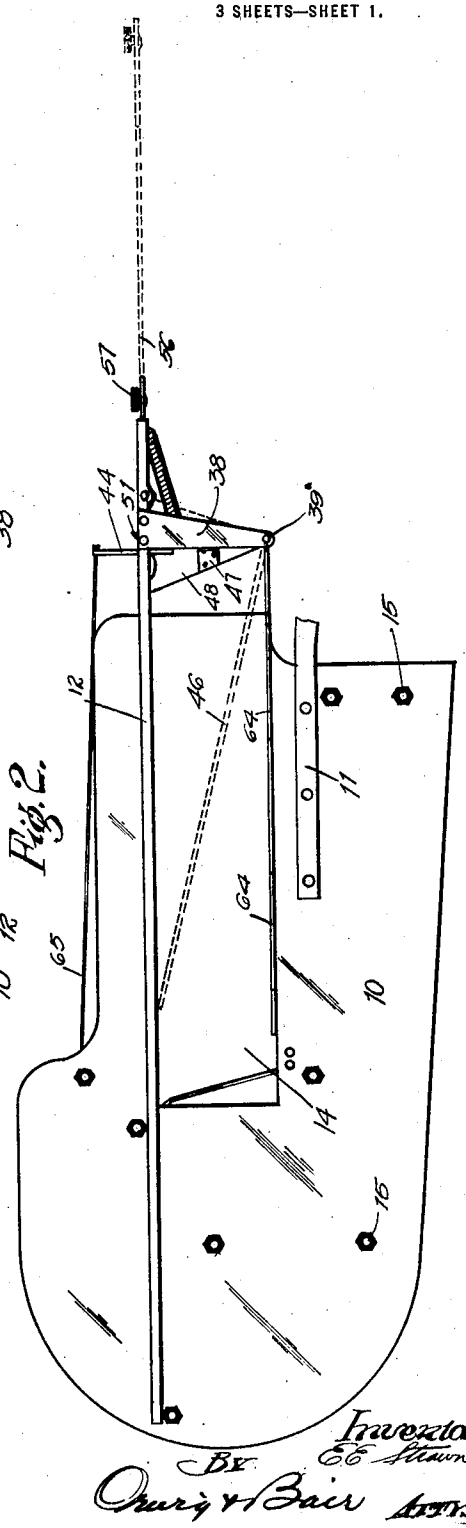


Fig. 2.

Witnesses
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3 SHEETS—SHEET 2.

Fig. 3.

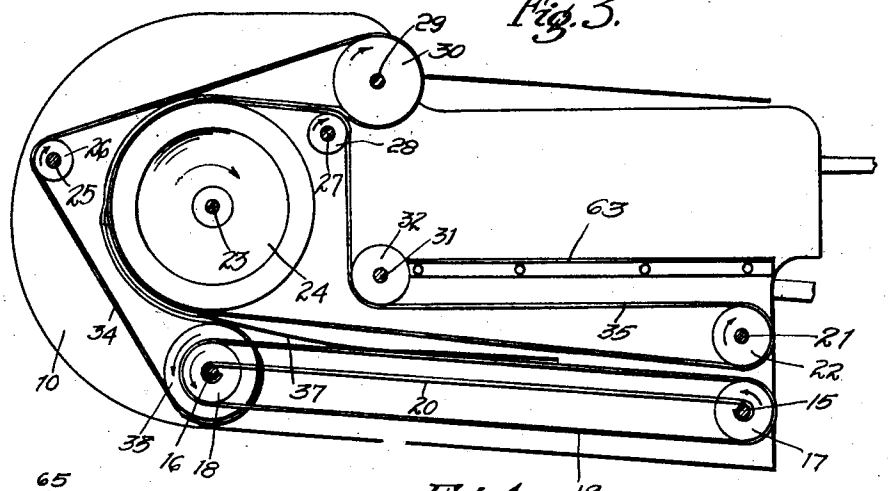


Fig. 4.

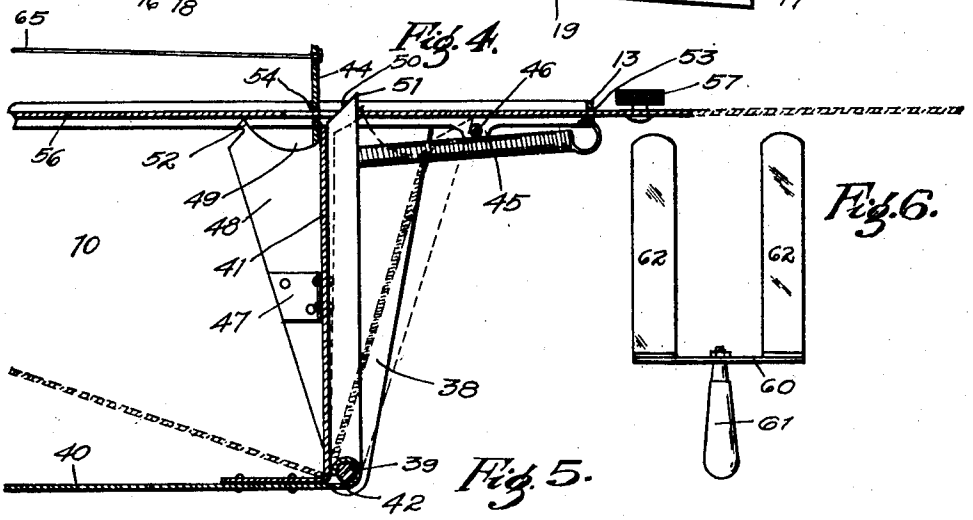
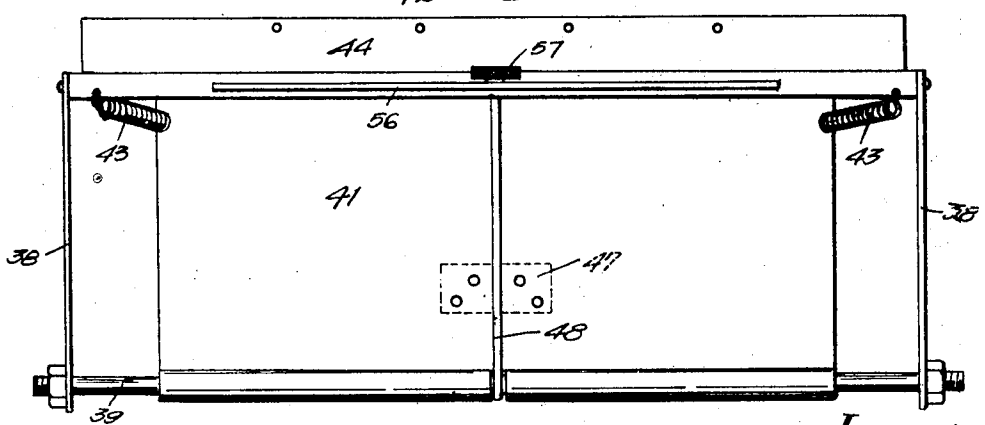


Fig. 6.

Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 9.

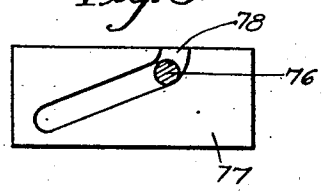


Fig. 10.

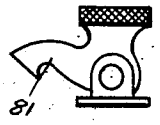


Fig. 8.

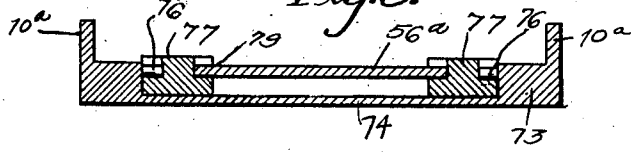
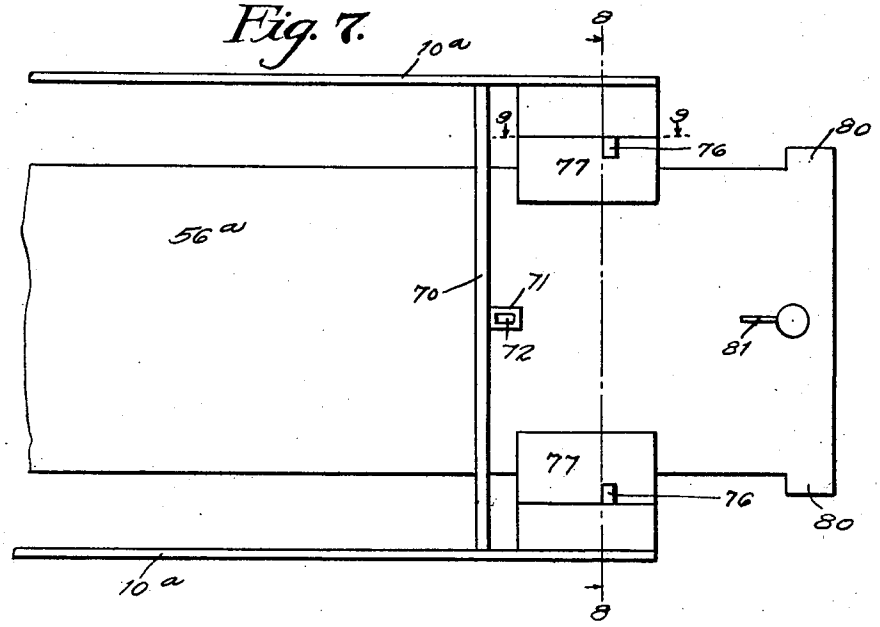


Fig. 7.



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UNITED STATES PATENT OFFICE.

ERVIN E. STRAWN, OF DES MOINES, IOWA.

PAPER-HANDLING DEVICE.

1,355,364. Specification of Letters Patent. Patented Oct. 12, 1920.

Application filed October 28, 1919. Serial No. 334,076.

To all whom it may concern:

Be it known that I, ERVIN E. STRAWN, a citizen of the United States, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Paper-Handling Device, of which the following is a specification.

The object of my invention is to provide a paper handling device of simple, durable and inexpensive construction.

It is well known that in many printing machines paper comes from the printing mechanism with the printed surface down.

It is the object of my invention to take such paper, after the paper has been cut in sheets, and print it so that the printed side will be up and delivered to a suitable receptacle or support.

A further object is to provide such a device having simple parts whereby a pile of sheets may be readily and easily removed without stopping the operation of the press or other machine which is delivering the paper to my device.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of a paper handling device embodying my invention.

Fig. 2 shows a side elevation of the same.

Fig. 3 shows a detail, sectional view taken on the line 3—3 of Fig. 1, parts shown being omitted for more clearly illustrating the parts.

Fig. 4 shows a detail, sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 shows a front elevation of the device.

Fig. 6 shows a plan view of the removable paper holder, parts being omitted for the sake of clearness.

Fig. 7 shows a top or plan view of a modified form of the sliding paper platform and supporting parts therefor.

Fig. 8 shows a detail, sectional view taken on the line 8—8 of Fig. 7.

Fig. 9 shows a detail, sectional view taken on the line 9—9 of Fig. 7; and

Fig. 10 shows a side elevation of the pivoted lock device.

In the accompanying drawings I have used the reference numeral 10 to indicate generally the side frame members of my improved paper handling device.

The frame members 10 may be supported by brackets 11 on the frame of a printing press or the like at such a point as to permit the delivery of the sheets of paper from the press to my device.

Secured to each frame member 10 is a substantially horizontal bar 12 which projects forwardly beyond the frame members 10. The bars 12 are connected at their forward end by means of a cross bar 13.

The frame member 10 on one side of the device has a horizontal opening 14 to permit the removal of the paper, which opening extends from the forward end of the device rearwardly as illustrated in Fig. 2.

Mounted in the frame members 10 are transverse shafts 15 and 16, the former being near the forward end of the device and the latter spaced somewhat from the rearward end of the device and both being near the lower portion of the device.

Mounted on the shaft 15 are rollers 17. Mounted on the shaft 16 in line with the rollers 17 are rollers 18 which are alined with the respective rollers 17.

On the alined rollers 17 and 18 are endless belts 19.

The shafts 15 and 16 are braced and connected by suitable braces 20.

Suitably mounted above the shaft 15 is a transverse shaft 21 on which are rollers 22.

Suitably mounted above the shaft 16 is a shaft 23 on which are larger respective rollers 24 alined with the rollers 22.

Spaced rearwardly and preferably slightly upwardly from the shaft 23 is a shaft 25. On the shaft 25 are rollers 26, in line with the respective rollers 24, and located forwardly and upwardly with relation to the shaft 23 is another transverse shaft 27 on which are rollers 28 alined with the respective rollers 24 and 26.

Mounted in the frame members 10 upwardly and forwardly from the shaft 27 is still another shaft 29 on which are rollers 30 alined with the respective rollers 28, 24 and 26.

Below the shaft 29 and below and slightly forwardly with relation to the shaft 27 is a shaft 31 on which are rollers 32 in line with the respective rollers 22, 28, 30, 24 and 26.

On the shaft 16 is another set of rollers 33. Extending around each set of alined rollers 33, 26, 30, and 24 is an endless belt 34, which is threaded around a roller 33, thence rearwardly and upwardly around a roller 24, thence forwardly and around a roller 30, thence rearwardly and around a roller 26, and thence to the roller 33.

Extending around each alined set of rollers 22, 24, 28, and 32 is an endless belt 35 which is extended around a roller 22, thence rearwardly and around the roller 24 underneath the endless belt 34, thence forwardly around a roller 28, thence downwardly and around a roller 32 and thence to the roller 22.

It will be noted that the belts 34 and 35 travel around the roller 24 together, and from thence to the rollers 28 and 30 together.

On the shaft 23 is a driving device 36 such as a belt pulley, by means of which motion may be transmitted to the various rollers and endless belts.

Assuming that the paper is fed between the rollers 17 and 22, it is obvious that the paper will be carried between the adjacent stretches of the belts 19 and 35 from said rollers rearwardly in the machine to the rollers 24.

Assuming that the rollers 24 move in the direction indicated by the arrow in Fig. 3, then the other rollers will be rotated in the direction indicated by the arrow thereon. When the paper reaches the rollers 33 it will be carried upwardly between the belts 34 and 35 around the rollers 24. A sheet of paper is indicated at 37 passing around the rollers 24.

The paper then passes upwardly, and is turned over and moved forwardly in the machine between the rollers 28 and 30 and is then discharged from the endless conveyers.

The shafts 31 and 27 and the rollers 32 and 28 are so located and are of such size that the stretches of the belt 35 between the rollers 28 and 32 are inclined downwardly and slightly forwardly, so that the rear edges of the paper discharged from between the rollers 30 and 28 will be engaged by said stretches and moved downwardly away from the rollers 28 and 30 so as to prevent any clogging of the paper at the point of discharge from the endless belts.

Extending downwardly from the frame members 12 near the forward end of the device are brackets 38 which support at their lower ends a transverse shaft 39.

I provide a paper receiving device comprising a bottom 40 and a forward end 41. At the line of connection between the bottom 40 and the end 41, the paper receiving device is mounted on the shaft 39 by means of journals 42.

Connected with the frame member 13 are springs 43 which extend rearwardly and are connected with the member 41 and normally tend to hold the bottom member 40 yieldingly inclined upwardly and forwardly from the shaft 39.

Connecting the frame members 12 rearwardly of the transverse frame member 13 is another transverse frame member 44. On the frame members 12 are ears 45, shown in Fig. 4.

Mounted in the ears 45 is a transverse shaft 46.

Pivotally supported on the shaft 39 and secured to the bottom member 40 by brackets 47 is a pawl 48 extending upwardly and having at its upper end a central recess 49.

At the forward upper edge of the pawl 48 is a beveled edge 50 terminating in a point 51. At the rear upper edge of the pawl 48 is an upwardly projecting finger 52. In the frame members 13 and 44 are formed transverse slots 53 and 54 horizontally alined with each other.

I provide a slidable plate or table 56 having at its forward end a handle 57, which plate or table is designed to be extended through the slots 53 and 54.

In the plate 56 near the forward and rear ends, respectively, are slots 58 and 59 alined with each other longitudinally of the device and designed to coact with the pawl 48 in the manner hereinafter described.

I provide for use in connection with my device already described, a paper holder comprising a wall 60, secured to which is a handle 61. Extending forwardly from the opposite ends of the wall 60 are strips 62.

In the practical use of my improved device it will be understood that the device is used in connection with a printing machine, or at least with a machine which feeds sheets of paper to the device.

Power is applied to the attachment through the driving device 36.

The sheets of paper are fed in the manner hereinbefore described, and are discharged from between the rollers 28 and 30 toward the bottom 40, which normally stands in the position indicated by dotted lines in Figs. 2 and 4.

After the pile of sheets has been delivered to the bottom 40, then the operator inserts the plate 56 through the slots 53 and 54 and slides the plate rearwardly in the machine.

The points 52 and 51 are at such heights that they tend to raise the plate slightly.

As the plate is shoved rearwardly in the machine it engages the point 52 and thereby tends to shove the pawl rearwardly and raise the point 51. When the slot 58 registers with the point 51, the weight of the plate on the point 52 causes the point 51 to project upwardly through the slot 58. The

pawl then limits the forward movement of the plate 56 through the following means:

On the frame member 10, on the side thereof opposite the opening 14, is an angle iron 63 which limits the downward movement of the bottom 40, and when the bottom engages said angle iron 63 in its downward movement, the pawl is held against further movement.

The sheets of paper will then be delivered toward the plate 56 and the bottom 40 will be in horizontal position, as illustrated in Fig. 2. The bottom 40 has in its side edge adjacent to the opening 14 slots 64. The paper holding and removing device is then used.

The strips 62 are inserted above the bottom 40 underneath the lowermost sheet of paper. The operator can then grasp the pile of paper on the bottom 40 between his fingers, access to the paper being permitted by the slots 64, and remove the pile, which will rest on the strips 62. Thereafter the plate 56 may be pulled forwardly and removed. The paper will be engaged by the frame member 44 and will drop onto the bottom 40. As the plate 56 is withdrawn it will move the pawl 48 from its position shown in full lines in Fig. 4, to its position shown by dotted lines.

The shaft 29 may be connected with the frame member 44 by a series of wires 65, which will prevent the paper from being blown up off the pile by a current of air.

It will be seen that with a device of this kind sheets of paper which may have been printed on their under sides may be turned over, so that they can be readily read, and with many printing machines this operation is a highly desirable one.

Furthermore the piles of sheets may be removed without stopping the operation of the machine.

The bottom 40 need not be adjustable as shown, but it is found that if it is slanted from the point just below the discharge point of the paper downwardly and away from such discharge point, that there is less likelihood of the paper curling over on said bottom.

In Figs. 7 to 10 inclusive I have shown a slightly modified form of my device. The frame members 10^a in the modified form, which correspond to the frame members 10 of the preferred form, are connected near their forward end with a transverse frame member 70 on which is a spring catch device 71 having an opening 72 therein, which catch device extends forwardly from the frame member 70.

At their forward ends the frame members 10^a are provided with inwardly extending shoulders 73, the lower edges of which are connected by a transverse member 74. The shoulders 73 have inwardly extending pins 76. Adjacent to each shoulder 73 and adapted to slide longitudinally in the machine is a block 77 having in its side adjacent to the nearest shoulder 73 a beveled slot 78 which receives one of the pins 76.

In the opposite side of each block 74 is a horizontal groove 79.

A plate 56^a corresponding to the plate 56 already described is slidably received in the grooves 79 which are long enough to furnish proper bearings.

At its forward end the plate 56^a is provided at its side edges with shoulders or lugs 80, which, when the plate 56^a reaches a certain position of its rearward movement in the device, engage the respective blocks 77 forcing them rearwardly in the machine and causing them to slide upwardly on the pins 76 until the pivoted catch device 81 engages the catch member 77.

The object of the structure disclosed in the preferred form of the invention, whereby the plate 56^a is slightly raised, is to lift the plate 56^a away from the paper below it slightly when the plate 56^a is inserted in its rearward position, so that if there is then resting on the bottom 40 a pile of paper which would otherwise frictionally engage the bottom 40 of the plate 56^a, such frictional engagement will be avoided.

Some changes may be made in the construction and arrangement of the parts of my improved device without departing from the essential features and purposes of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In a device of the class described; a frame; a series of endless conveyers supported thereon, adapted to receive paper and move it from said conveyers in position inverted with relation to its position when received; a receiving member; and a second receiving member; guides on said frame for receiving and supporting said second receiving member.

2. In a device of the class described; a frame; a pair of lower shafts spaced from each other longitudinally of said frame; laterally spaced endless conveyers operated from said shafts; conveyers for receiving paper tilted from said first conveyers, for inverting said paper, and discharging it while moving in a direction substantially opposite to that of its first movement in the device.

3. In a device of the class described; paper conveying means; a tiltable receiving member adapted to receive paper discharged from said conveying means; a slidably mounted paper receiving member adapted to be slid into position for receiving paper from the conveying means; and means actu-

ated by said sliding paper receiving member for moving said first paper receiving means away from its normal position to receiving position when the second receiving member is moved into receiving position.

4. In a device of the class described; a frame; a paper conveying mechanism mounted thereon; a removable receiving member adapted to be supported by said frame and stand in position for receiving paper from said conveying mechanism; a slidable paper receiving member adapted to slide into position adjacent to the discharge end of said conveying mechanism, said frame and said second paper receiving member having coacting means whereby when the second paper receiving member is moved to receiving position it is slightly raised.

5. In a device of the class described; a frame; a paper conveying mechanism mounted thereon; a receiving device pivotally supported adjacent to the discharge end of said conveying mechanism; means for normally holding said receiving device in inclined position; a sliding receiving member; guide devices on said frame for receiving said sliding receiving member; and means whereby the movement of such sliding receiving member into receiving position serves to move said first receiving member from its inclined position to substantially vertical position.

6. In a device of the class described; a frame; a pair of lower shafts spaced from each other longitudinally of said frame; laterally spaced endless conveyers operated from said shafts; conveyers for receiving paper tilted from said first conveyers, for inverting said paper, and discharging it while moving in a direction substantially opposite to that of its first movement in the device, said second described conveyers being arranged for movement at a greater rate of speed than said first conveyers.

Des Moines, Iowa, May 7, 1919.

ERVIN E. STRAWN.