

C. HENDERSON.
DELIVERY MECHANISM FOR PRINTING PRESSES.
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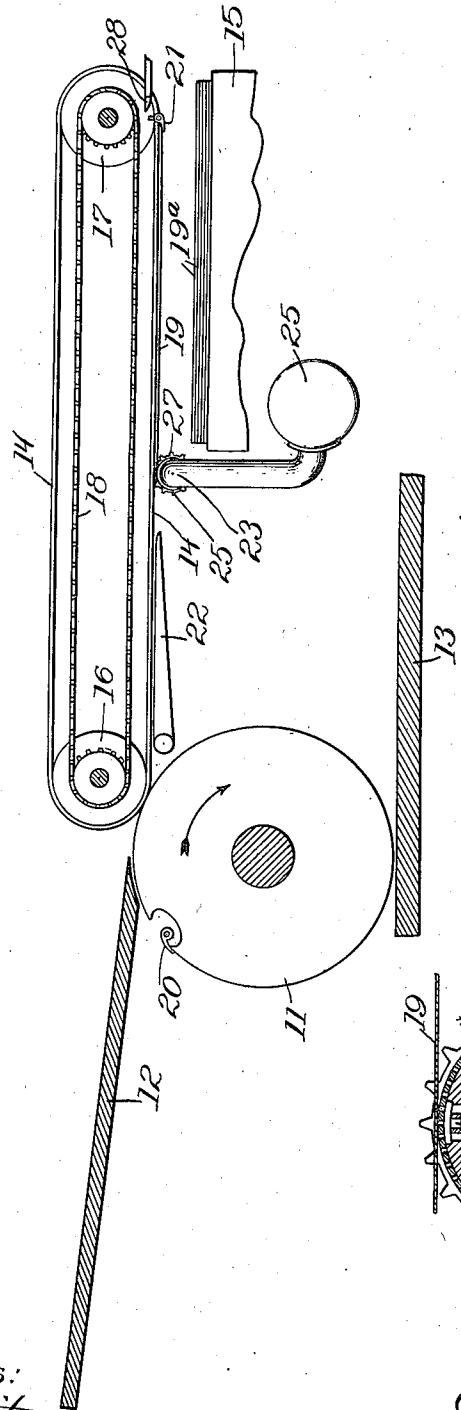


Fig. 1.

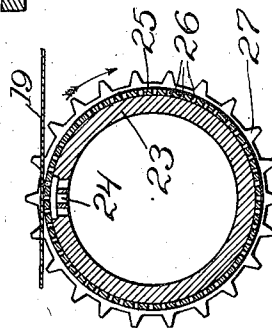


Fig. 2

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UNITED STATES PATENT OFFICE.

CARL HENDERSON, OF OAK PARK, ILLINOIS, ASSIGNOR TO MIEHLE PRINTING PRESS & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DELIVERY MECHANISM FOR PRINTING-PRESSES.

1,156,903.

Specification of Letters Patent.

Patented Oct. 19, 1915.

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To all whom it may concern:

Be it known that I, CARL HENDERSON, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Delivery Mechanism for Printing-Presses, of which the following is a specification.

The invention has for its object the provision of mechanism to effect a delivery of printed sheets from the impression cylinder to the pile of finished sheets in such a way as to insure the uniform stacking of the same in a vertical pile and to obviate the danger of offset or blur due to the relative movement or shifting of one sheet upon another.

Ordinarily as each sheet is carried by the delivery mechanism to and deposited upon the pile of sheets previously printed there is a tendency of the sheet to sag at the last moment before it is released by the gripper of the delivery mechanism and to wipe over the freshly printed surface of the preceding sheet on the pile, and it is for the purpose of avoiding this action of the delivery and causing the newly delivered sheet to drop vertically into place on the top of the pile that the present invention is designed.

In order that the invention and the manner of its operation may be readily understood a preferred embodiment of the same is set forth in the accompanying drawing and in the following description based thereon. The invention is, however, obviously susceptible of embodiment in other and varied constructional forms wherefore the drawing and description are to be construed in an illustrative and not in an unnecessarily limiting sense.

In the drawing—Figure 1 is a diagrammatic representation of a printing press assemblage including the invention; and Fig. 2 is an enlarged detail cross section through the suction restraining device.

In the drawing is set forth in a diagrammatic manner the impression cylinder 11, the feed board 12, the bed plate 13, the delivery tape 14, and the delivery table 15, upon which latter the printed sheets are deposited. In the form of delivery mechanism shown the tape 14 travels about the companion rollers 16 and 17 which are driven in unison by the sprocket chain 18 at

a peripheral speed corresponding to that of the cylinder 11. The sheet 19 having received its impression from the form upon the bed 13 while upon the impression cylinder 11, is released by the grippers 20 and engaged by the grippers 21 which latter draw the sheet over the supporting slats 22 toward the delivery table 15.

As it is impracticable to extend the supporting slats 22 over the table 15 so as to support the paper until it is finally released by the grippers 21, the rear portion of the sheet 19 ordinarily drops upon the pile of sheets indicated at 19^a as soon as it leaves the supporting slots and consequently wipes over the surface of the sheets 19^a during the final portion of its movement and until it is released by the grippers 21 and permitted to fall upon the other sheets.

In order to hold the freshly printed sheet in substantially the plane of the delivery and out of contact with the pile of printed sheets until it is finally released and permitted to drop thereon I have provided a suction restraining device which operates upon the trailing free portion of the sheet so as to maintain the same taut. As illustrated this restraining device consists of a suction pipe 23 extending horizontally beneath the path of the sheet and having upon its upper face a longitudinal series of orifices 24 through which suction generated by the exhaust device 25 is caused to act upon the sheet after it leaves the supporting slats, whereby the same is maintained under tension as it is drawn forward by the grippers 21. The suction pipe 23 is arranged adjacent that edge of the table 15 which is nearest the impression cylinder and means are provided to interrupt the suction action upon the sheet at the instant following the release of the sheet by the grippers 21. The interruption of the suction action takes place substantially simultaneously with the release of the sheet by the grippers but just sufficiently subsequent thereto to overcome the momentum of the sheet and to permit it to drop vertically on to the pile after its release.

The delivery mechanism thus far described is not of itself new but forms the subject matter of the co-pending application of another, Serial No. 800,016. In that case, however, mechanical means are employed to positively interrupt the suction in

the pipe 23 simultaneously with the release of the sheet by the grippers 21 or in the instant thereafter whereby the momentum of the sheet having been overcome by the restraint of the suction the latter was intermitted and the sheet allowed to drop by gravity on to the pile. In such form of construction a difficulty has been experienced in adjusting the cutting off of the suction with the requisite nicety relative to the time of release of the sheet by the grippers as to cause the sheet to be deposited in absolute register with the preceding sheets, there being manifested a tendency of the rear end of the sheet to remain at rest upon the suction pipe.

According to the present arrangement the suction through the pipe is not cut off but its action upon the sheet is interrupted by a traveling perforated cylindrical apron interposed between suction pipe and sheet and moving with the latter whereby after the suction action upon the sheet is interrupted the latter is carried forward with the apron and caused to fall free from the suction device on to the pile.

As illustrated the stationary suction pipe 23 has mounted thereon in closely enveloping relation a cylindrical apron 25 provided with numerous apertures 26. This apron may be of sheet metal or of wire cloth and is caused to revolve about and in contact with the outer surface of the suction tube 23 in any suitable manner as for instance by means of a driven sprocket 27 secured to one end of the foraminous cylinder 25, the direction of rotation of the cylinder being clock-wise as indicated in the figure, or in the same general direction as the travel of the sheet and the speed of rotation being such as to impart a surface speed less than that of the rate at which the sheet travels under the control of the grippers 21.

As the trailing portion of the sheet 19 is borne over the upper face of the suction device the suction acts thereon through the orifices 24 of the stationary pipe and those perforations 26 of the cylindrical apron 25 which are at the moment between the sheet 19 and the orifices 24, successive perforations 26 being brought into play as the sheet and the apron advance. The location of the suction device is such relative to the point of release by the grippers 25 under the action of the releasing member 28 that the rearward edge of the sheet will clear the suction openings of the tube 23 in the moment following the release of the forward edge of the sheet by the grippers 21 whereby the momentarily continued suction will overcome the momentum of the sheet and the forward travel of the apron 25 will cause the rear edge of the sheet to advance in a downward direction toward the pile

avoiding any tendency of the sheet to come to rest with its rear edge supported upon the suction device.

From the foregoing it will be readily understood that the sheet of paper carried by the delivery tape is retarded in its trailing operation and thus prevented from sagging into contact with the pile of printed sheets over which it is passing; that in the instant following its release by the grippers of the delivery mechanism the suction action upon its rear edge is likewise interrupted and the sheet is advanced and caused to drop accurately upon the pile of previously printed sheets thus avoiding any blurring action due to wiping contact between the sheets and also insuring the stacking of the sheets in a uniform pile.

I claim:

1. In a sheet delivery mechanism, the combination with traveling means for engaging the sheet, of a member having a perforate surface traversed by the sheet, means to cause suction through the perforate surface of the member upon the sheet to exert restraining tension thereon, and means to move the perforate member in the same general direction as the sheet but at a slower speed, the suction acting on the sheet during a portion at least of the time when it is under the control of the sheet conveying means.

2. In a sheet delivery mechanism, the combination with gripper mechanism for engaging the forward end of the sheet and conveying the same, of a member having a perforate surface traversed by the trailing portion of a sheet, means to cause suction through the perforate surface of the member upon the sheet to exert restraining tension thereon, and means to move the perforate member in the same general direction as the sheet but at a slower speed, the suction acting on the sheet during a portion at least of the time when it is under the control of the gripper mechanism.

3. In a sheet delivery mechanism, the combination with traveling means for conveying the sheet, of a suction member having a perforated surface traversed by the trailing portion of the sheet to exert restraining tension thereon, and a moving foraminous apron interposed between the perforate suction surface and the sheet, said apron moving in the same general direction as the sheet, the conveying means and the restraining mechanism acting for a time independently and for a time concurrently upon the sheet.

4. In a sheet delivery mechanism, the combination with traveling means for conveying the sheet, of a suction member having a perforated surface traversed by the trailing portion of the sheet to exert restraining tension thereon, and a moving foraminous

apron interposed between the perforate suction surface and the sheet, said apron moving in the same general direction as the sheet and at a slower speed, the conveying means and the restraining mechanism acting for a time independently and for a time concurrently upon the sheet.

5. In a sheet delivery mechanism, the combination with traveling means for conveying the sheet, of a suction tube having a perforated surface traversed by the trailing portion of the sheet to exert restraining tension thereon, and a foraminous apron interposed between the perforate suction surface and the sheet, said apron moving in the same general direction as the sheet and at a slower speed, the conveying means and the restraining mechanism acting for a time independently and for a time concurrently upon the sheet.

6. In a sheet delivery mechanism, the combination with traveling means for conveying the sheet, of a suction tube having a perforated surface traversed by the trailing portion of the sheet to exert restraining tension thereon, and a foraminous cylindrical apron closely enveloping the tube between the perforate suction surface thereon and

the sheet, said apron revolving about said tube in the same general direction as the sheet movement, the conveying means and the restraining mechanism acting for a time independently and for a time concurrently upon the sheet.

7. In a sheet delivery mechanism, the combination with traveling means for conveying the sheet, of a suction tube having a perforated surface traversed by the trailing portion of the sheet to exert restraining tension thereon, and a foraminous cylindrical apron closely enveloping the tube between the perforate suction surface thereon and the sheet, said apron revolving about said tube in the same general direction as the sheet movement and at a slower speed, the conveying means and the restraining mechanism acting for a time independently and for a time concurrently upon the sheet.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CARL HENDERSON.

Witnesses:

CHAS. J. FRÉCHETTE,
BASIL I. PETERSON.