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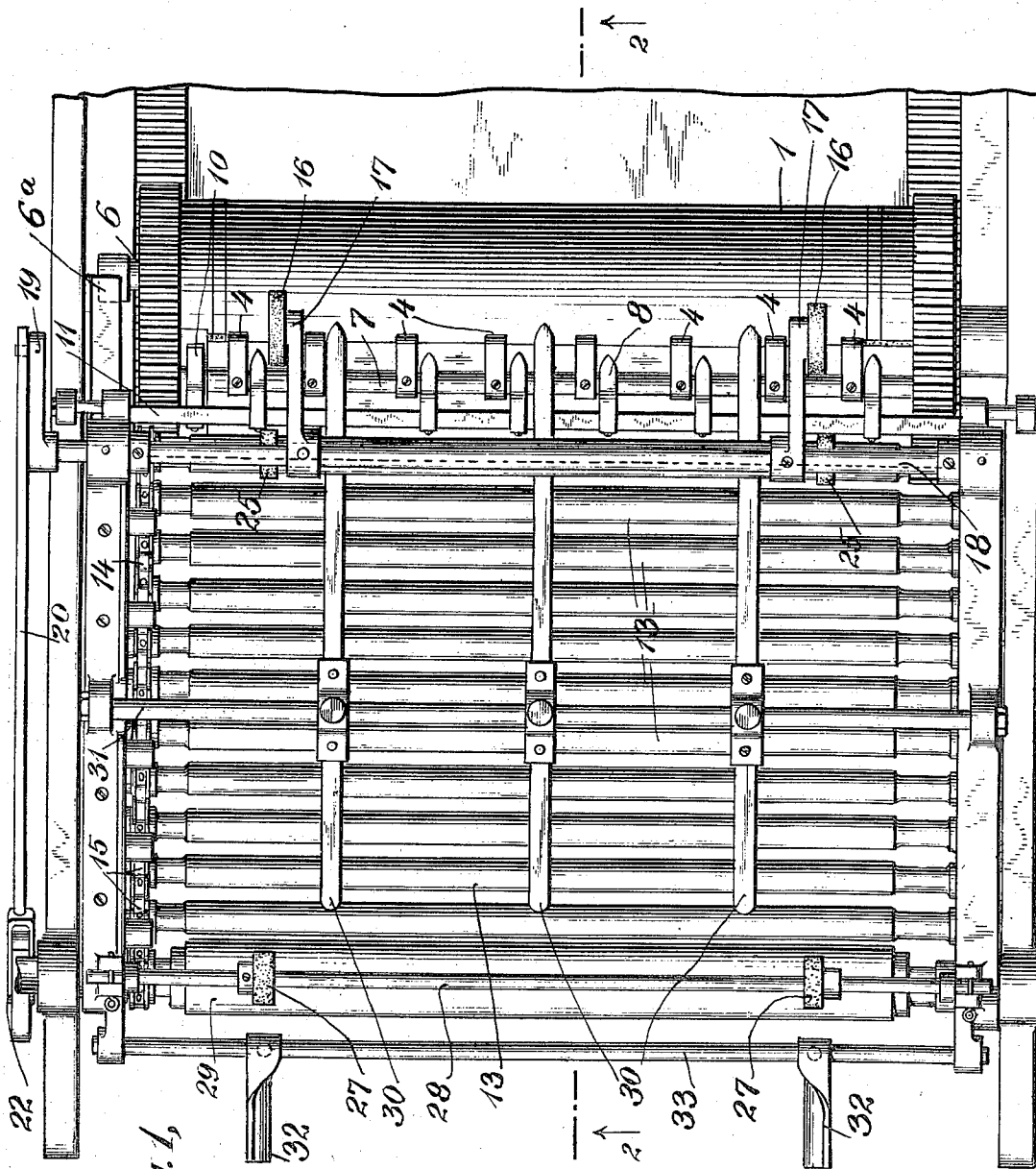
DELIVERY MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED APR. 20, 1908. RENEWED APR. 27, 1911.

1,011,046.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 1.



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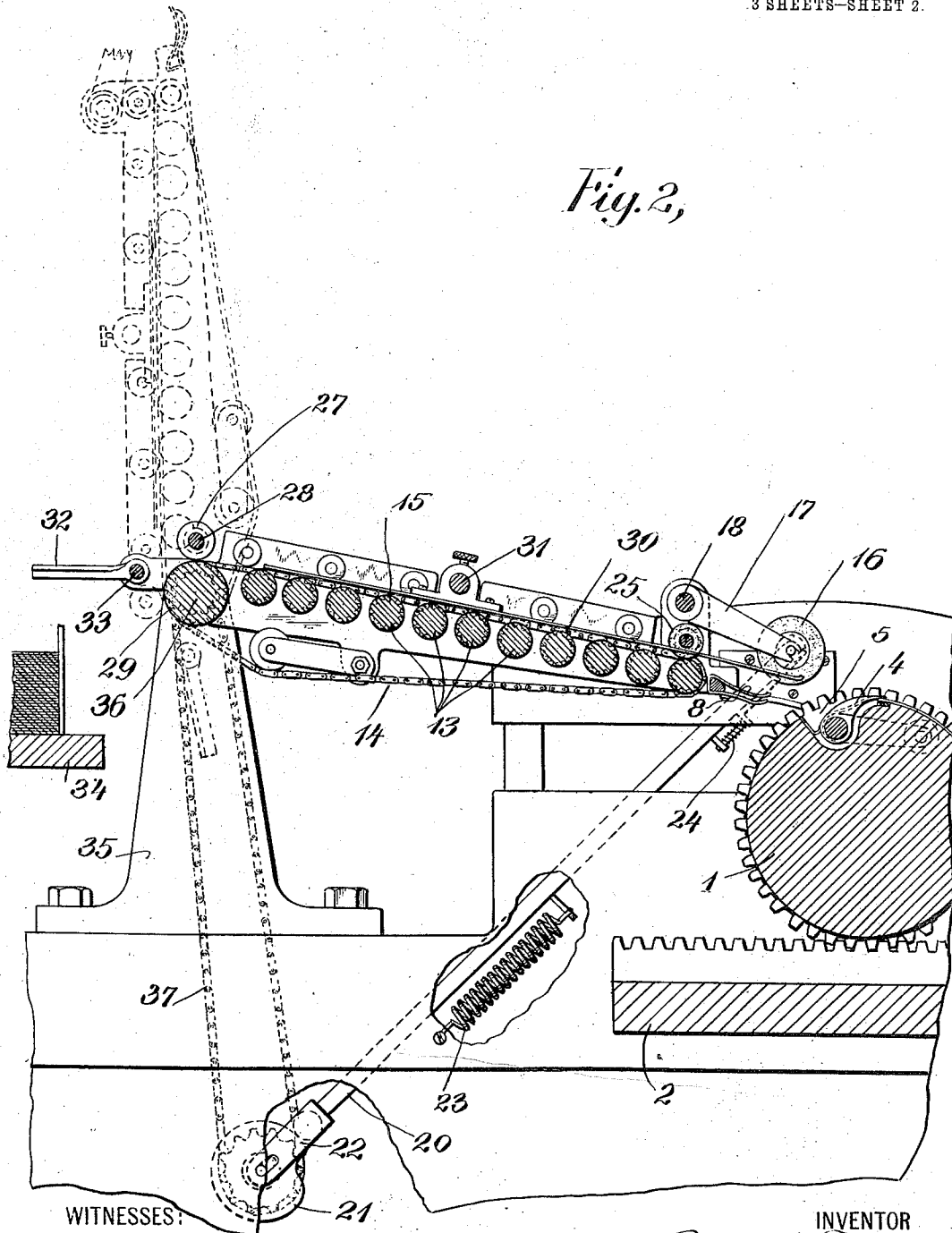
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DELIVERY MECHANISM FOR PRINTING PRESSES.

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3 SHEETS--SHEET 2.

Fig. 2,



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3 SHEETS—SHEET 3

Fig. 4,

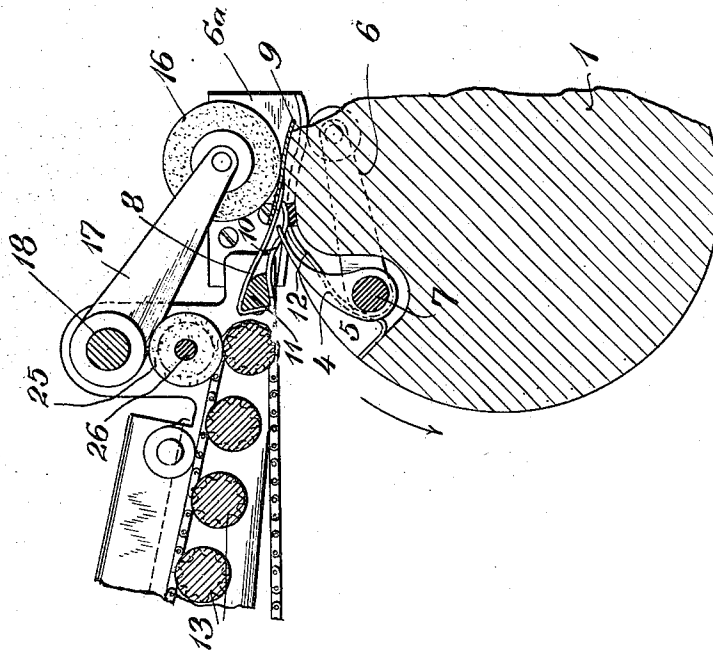
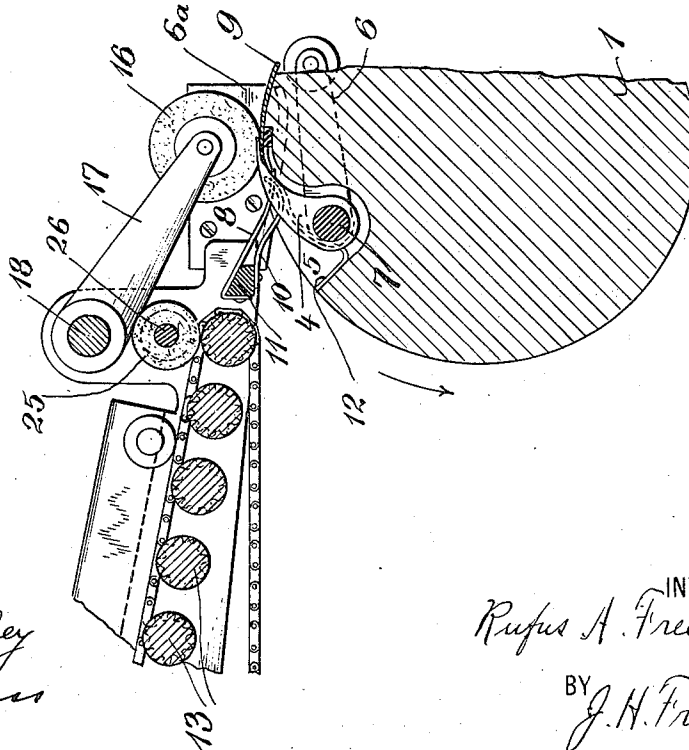


Fig. 3,



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UNITED STATES PATENT OFFICE.

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DELIVERY MECHANISM FOR PRINTING-PRESSES.

1,011,046.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed April 20, 1908, Serial No. 428,256. Renewed April 27, 1911. Serial No. 623,643.

To all whom it may concern:

Be it known that I, RUFUS A. FREEMAN, a citizen of the United States, and a resident of Flushing, Queens county, State of New York, have invented certain new and useful Improvements in Delivery Mechanism for Printing-Presses, of which the following is a specification.

The invention relates to printing presses and more particularly to presses having a traveling impression cylinder, and to sheet delivery mechanism for such presses, although in certain of its aspects the invention may be useful for other kinds of presses.

Objects of the invention are to provide for reliable delivery of the sheets at high speed; to provide for such delivery in connection with a traveling impression cylinder; to provide for reliably taking off the sheets from the impression cylinder at the end of its path of travel and conveying same to the delivery mechanism; to provide rapid and positive means for conveying the sheets successively at high speed through the delivery mechanism; to provide simple means for rapid and reliable delivery of the sheets from the said mechanism to the stack or table; to provide for the rapid, reliable and efficient handling and delivery of sheets of various sizes and weights; to effect all these objects reliably so as to permit continuous running of the press at high speeds; to provide for such a construction and arrangement of mechanism as will permit easy access to both the bed and the cylinder of the press, for making ready, cleaning, adjusting, or other purposes. These and other objects of the invention will in part be obvious and will in part be set forth herein.

The invention consists in the novel parts, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, the same serving in connection with the description herein to explain the principles of the invention.

Of the drawings: Figure 1 is a plan view of mechanism constructed in part in accordance with the principles of the invention; Fig. 2 is a corresponding vertical section partly in elevation; and Figs. 3 and 4 are

detail views, partly in section, showing certain mechanisms in different positions.

In the embodiment illustrated in the accompanying drawings by way of example, a printing press is shown having a printing couple consisting of a flat bed and an impression cylinder, the bed and the cylinder both traveling during the impression. The impression cylinder is indicated by the reference numeral 1 and the bed by 2. It will be understood that suitable driving mechanism for the bed and cylinder, together with suitable means for causing them to move in proper relation to each other, and all other necessary parts of suitable and convenient form will be provided. The same are not shown herein in detail, however, as such details constitute no part of the present invention.

The cylinder 1 is shown provided with suitable grippers 4 for holding the sheet on the impression cylinder while it is passing through the press. The said grippers are shown mounted in a longitudinal recess 5 in the impression cylinder. Suitable devices for causing the grippers to open and close to receive and deliver the sheet may be provided, which may be of any convenient or approved form, and are shown herein as comprising an arm 6 attached to the gripper shaft 7 and cams carried by the frame of which the delivery cam is shown at 6^a.

A printing press of this general description is adapted to print upon sheets at a high speed and it is therefore necessary to have therewith a delivery mechanism which can be relied upon to receive, convey and deliver the sheets at the required high speed and which will always take the sheet from the cylinder at the end of its path of travel so that there will be no danger of the press becoming clogged with resulting damage to forms, soiling of the impression cylinder, and trouble and loss of time incurred by stoppage of the press. A sheet delivery mechanism possessing these features is provided by the present invention. The particular embodiment of such mechanism illustrated herewith comprises a series of stripper fingers 8 which serve to transfer the sheet from the impression cylinder to suitable devices for carrying the sheet to the stack. The particular form of such conveying devices employed in the illustrated em-

bodiment will be described hereinafter. The stripper fingers 8 are mounted independently of the impression cylinder, and in this embodiment are mounted on the receiving end of the delivery mechanism. The parts are constructed and arranged so that as the impression cylinder approaches the limit of its travel toward the delivery mechanism the stripper fingers project into the longitudinal recess 5 in the impression cylinder, the stripper fingers passing beneath the sheet 9 and then are moved outwardly lifting the sheet from the cylinder. The sheet thus passes over the stripper fingers to the conveying devices.

Suitable means are provided for giving the necessary movement to the stripper fingers 8, the illustrated form thereof comprising an arm 10 attached to the support 11 upon which the stripper fingers are carried. A suitable cam 12 is carried upon the impression cylinder and is so shaped and located that as the impression cylinder approaches the limit of its movement, the cam engages the arm 10 moving the arm and stripper fingers 8 outwardly. This movement occurs in proper relation to the position of the cylinder and the action of the grippers 4. It will thus be seen that in the illustrated form, these devices are operated by the traveling movement of the impression cylinder to perform the functions described.

Suitable means are provided in the delivery mechanism for conveying the sheets to the receiving table and in the present embodiment said conveying means comprise a series of continuously driven rollers 13. The particular form of driving means for the said rollers shown in the drawings comprises a sprocket chain 14 which passes over suitable sprocket wheels 15 at the end of each of the rollers 13. Suitable driving means for the sprocket chain 14 are provided, the particular form thereof shown herein being described hereinafter.

Means are also provided, according to certain aspects of the invention, for causing the sheet to be advanced from the cylinder on to the stripper fingers after they have passed underneath the sheet, the particular form of such advancing means shown in the present embodiment comprising rollers 16 which are shown mounted upon arms 17 fast to the shaft 18. Suitable actuating means are provided to cause the rollers 16 to pass into engagement with the impression cylinder so as to cause the sheet to be advanced by the cylinder on to the stripper fingers and to the conveying devices. Detachably engaging an arm 19 fixed on shaft 18 there is shown a link 20 which is also in operative relation with a cam 21, by means of its forked end 22, in which is shown mounted a suitable anti-friction roller. The spring 23 serves to hold the roller 22 to the cam. For the purpose of

detaching the link 20 from the arm 19 a spring-pressed latch 24 is provided.

Means are provided by the invention for positively advancing a sheet from the impression cylinder to the series of rollers 13, and the form of said means illustrated herein comprises a plurality of rollers 25 carried on a shaft 26. The said rollers press the sheet into positive engagement with the first driven roller of the series and the sheet thus receives a positive advancing movement carrying it certainly and quickly forward. These rollers 25 are preferably of a resilient material in order to give a close and positive contact. The said rollers 25 are shown transversely adjustable so as to operate upon sheets of different widths or to suit arrangements of the printed matter upon the sheets, or for other purposes.

The invention further contemplates the providing of means at the delivery end of the series of rollers 13 for positively advancing a sheet off from the said series of rollers on to the table, stack or other receiving means. The form of said means shown in the illustrated embodiment comprises rollers 27 mounted upon a shaft 28 and being transversely adjustable thereon. Coöperating with the said rollers so as to take a sheet therebetween is the positively driven roller 29. It will thus be understood that the sheet is quickly and reliably fed off.

Means are also provided for retaining the sheets upon the series of driven rollers 13 intermediately of the said means for advancing sheets on to and off from the said series of rollers. The illustrated form of such means comprises a series of guides 30, located above the driven rollers 13 and separated therefrom to permit the sheets to pass therebetween. These guides are shown mounted upon a rod 31 and transversely adjustable thereon. The said guides are also constructed so as to extend outwardly at the press end, so as to overhang the stripper fingers and also the impression cylinder when near the limit of its travel and thus insure the passing of the sheet beneath the rollers 25.

For the purpose of effecting rapid delivery of the successive sheets in proper position onto the sheet stack, means are provided for stiffening the sheets as they are fed off from the conveyer rolls so that they will pass straight outwardly and then fall flat upon the stack. The form of such means provided comprises two blades 32 which engage and bend the side edges of the sheet as it emerges from between the rolls 27 and 29. This bending of the side edges gives the proper stiffening to the sheet to permit of its rapid and successful delivery. The said blades are shown adjustably mounted upon a rod 33, to accommodate sheets of various widths.

Sheet receiving means are provided which

may be of any suitable or convenient form. Such means are shown generally herein as a jogging table 34.

The invention in certain of its aspects contemplates providing in connection with the traveling cylinder and the delivery mechanism a support for the latter, the construction being such that the delivery mechanism may be moved away from the impression cylinder. In the present embodiment a pivotal support for the delivery mechanism is provided, so that said mechanism may be swung upwardly away from the impression cylinder. In the drawing a support 35 for the delivery mechanism is shown suitably carried upon the press frame. The said support is pivotally connected to the delivery mechanism so that the delivery mechanism may be moved away from the impression cylinder by being swung upwardly as illustrated by dotted lines in Fig. 2 of the drawings. In connection with this form of construction, driving means for the series of rollers 13 are provided in concentric relation with the pivotal support of the delivery mechanism. The driving sprocket wheel 36 for the sprocket chain 14 is shown concentric with the said pivotal support. A sprocket chain 37 serves also to drive the sprocket wheel 36, and in turn is driven by any suitable source of power. Any necessity for coupling and uncoupling the drive for the rollers 13 is thus obviated, and it is merely necessary to swing the delivery mechanism down into operative relation with the cylinder or to swing it up away therefrom so as to give fuller and easier access to the cylinder and to the bed.

The manner of the operation of the foregoing mechanism is substantially as follows: A sheet is fed to the impression cylinder 1 by suitable devices (not shown herein) and taken by the grippers 4. The bed 2 then travels in one direction and the cylinder in the opposite direction, the cylinder in the meantime rolling on the form for the impression in a manner well understood. As the cylinder approaches the limit of its path of travel, the stripper fingers 8 enter the longitudinal recess 5 in the cylinder and engage the sheet. The cam 12 acting upon the arm 10 is operated by the traveling movement of the cylinder so as to move the stripper fingers outwardly, the stripper fingers passing underneath the sheet as it is released by the grippers. At about the same time the rollers 16 are moved downwardly by the actuating mechanism, hereinbefore described, in contact with the outward face of the sheet upon the impression cylinder and thus, the sheet is caused to be advanced by the cylinder on to the stripper fingers and to the series of driven rollers 13. The top guides 30 extending downwardly insure the passing of the sheet between the rollers

25 and the first of the series of rollers 13. The sheet is then carried rapidly by the positive movement of the driven rollers to the receiving end and is there positively advanced off from the receiving rollers to the receiving table the blades 32 at the same time coöperate to bend the edges and stiffen the sheet as hereinbefore described, so that the sheet is delivered extending flat over the stack and is prevented from doubling or folding over by reason of the front end falling first. To move the delivery mechanism into and out of operative position, the latch 24 is drawn to disengage the link 20 from the arm 19 and the said mechanism is then swung upwardly, as hereinbefore described. It will be understood that the parts may be formed and proportioned so that gravity will cause the delivery to remain stable in the upright position.

From all the foregoing it will be understood that the various parts and devices, singly and in their coöperation contribute to effect the rapid and reliable handling of the sheets, and that a machine has been provided which realizes the objects of invention and the advantages herein set forth, together with other objects and advantages.

The invention in its broader aspects, is not limited to the particular construction shown, nor to any particular construction by which it has been or may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

What I desire to claim as my invention, and to secure by Letters Patent, is:—

1. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, and a receiving table for receiving the sheets directly from the said rollers.

2. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers and means at the press end of said series of rollers for positively advancing a sheet from the impression cylinder to the said series of rollers.

3. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheet from the cylinder to the rollers, means at the delivery end of said series of rollers for positively advancing a sheet off from the said series of rollers on

to a receiving means, and means for receiving the sheets.

4. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, means at the press end of said series of rollers for positively advancing a sheet from the impression cylinder to the said series of rollers, and means at the delivery end of said series of rollers for positively advancing a sheet off from said series of rollers on to a receiving means, and means for receiving the sheets.

5. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, means at the press end of said series of rollers for positively advancing a sheet from the impression cylinder to the said series of rollers, means at the delivery end of said series of rollers for positively advancing a sheet off from said series of rollers on to a receiving means, means for retaining the sheets upon the series of rollers intermediately the said two advancing means, and means for receiving the sheets.

6. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, a plurality of transversely adjustable rollers for positively advancing the sheets on to the said series of rollers, and a receiving table for receiving the sheets directly from the said series of rollers.

7. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, a plurality of transversely adjustable rollers cooperating with one of the rollers of said series to advance the sheets off from the said series of rollers on to a receiving means, and means for receiving the sheets.

8. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, the first and last rollers of said series being continuous longitudinally, a plurality of transversely adjustable rollers cooperating with the said first roller, a plurality of transversely adjustable rollers cooperating with the said last roller, and means for transferring the sheets from the impression cylinder to the delivery mechanism.

9. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, and transversely adjustable guides at the delivery end of said mechanism for engaging the side edges of the sheet to bend said edges and thereby stiffen the sheet as it is delivered, and means for receiving the sheet.

10. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, and top guide fingers above the said rollers and extending to a point above the impression cylinder when the sheet is released therefrom.

11. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism located at one end of the travel of said cylinder, said delivery mechanism comprising stripper fingers, conveying devices for receiving the sheets from the stripper fingers, top guide fingers above said conveying devices and extending to a point above said stripper fingers and also above the impression cylinder when the sheet is released therefrom.

12. A printing press including in combination a traveling impression cylinder, a relatively stationary delivery mechanism, said mechanism comprising a series of continuously driven rollers, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, a roller above the first roller of the said series to receive the sheet therebetween, and top guide fingers above said series of rollers and extending past said upper roller and above the stripper fingers.

13. A printing press including in combination a traveling cylinder, an oppositely reciprocating bed, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, a support for said delivery mechanism, the construction being such that the delivery mechanism may be moved out of operative relation so as to expose both the cylinder and the bed, stripper fingers mounted on the receiving end of the delivery mechanism, and means for receiving the sheet from the delivery mechanism.

14. A printing press including in combination a traveling impression cylinder, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, stripper fingers mounted on the press end of the said delivery mechanism, and a support

for said delivery mechanism, the construction being such that the delivery mechanism may be moved away from the impression cylinder.

15. A printing press including in combination a traveling impression cylinder, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, stripper fingers mounted on the receiving end of the said delivery mechanism, and a pivotal support for the said delivery mechanism so that it may be swung upwardly away from the impression cylinder.

16. A printing press including in combination a traveling impression cylinder, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, said delivery mechanism comprising a series of positively driven rollers, stripper fingers mounted on the receiving end of the said delivery mechanism, and a support for said delivery mechanism, the construction being such that the delivery mechanism may be moved away from the impression cylinder.

17. A printing press including in combination a traveling impression cylinder, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, said delivery mechanism comprising a series of positively driven rollers, stripper fingers mounted on the receiving end of the said delivery mechanism, a pivotal support for the said delivery mechanism so that it may be swung upwardly from the said cylinder, and driving means for said series of rollers in concentric relation with said pivotal support.

18. A printing press including in combination a traveling impression cylinder, a normally stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, a support for said delivery mechanism, the construction being such that the delivery mechanism may be moved out of operative relation with the impression cylinder, stripper fingers mounted on the receiving end of the delivery mechanism, and a roller mounted at the receiving end of said delivery mechanism for causing the sheet to be advanced by the cylinder on to the stripping fingers.

19. A printing press including in combination a traveling impression cylinder having a longitudinal recess, grippers mounted in said recess, relatively stationary stripping fingers constructed and arranged to project into said recess in said cylinder as the latter approaches the limit of its travel in one direction, means for moving said stripping fingers outwardly to lift the sheet as the same is released by the grippers, a roller for

causing the sheet to be advanced by the cylinder on to the stripping fingers, and means for receiving the stripped sheet.

20. A printing press including in combination a traveling impression cylinder, relatively stationary stripping fingers, devices operated by the traveling movement of the said cylinder for moving said fingers relatively to the cylinder to strip the sheet therefrom prior to the end of the traveling movement, and means for receiving the sheet from the stripping means.

21. A printing press including in combination a traveling impression cylinder having a longitudinal recess, grippers mounted in said recess, relatively stationary stripping fingers constructed and arranged to project into said recess, and means operated by the travel of the cylinder for moving the stripping fingers outwardly to lift the sheet as it is released by the grippers prior to the end of the traveling movement.

22. A printing press including in combination a traveling impression cylinder, a delivery mechanism comprising a series of constantly driven rollers, a plurality of transversely adjustable rollers, above the first roller of said series, a plurality of transversely adjustable rollers above the last roller of said series, a series of stripper fingers for transferring the sheets from the cylinder to the rollers, a series of top guide fingers above said series of constantly driven rollers and extending between and past the first-mentioned plurality of adjustable rollers, and also extending above the stripper fingers and the impression cylinder when the sheet is released therefrom.

23. A printing press including in combination a traveling impression cylinder having a longitudinal recess therein, a series of grippers mounted in said recess, a series of stripper fingers mounted independently of the impression cylinder, means operated by the travel of the cylinder for moving the stripping fingers outwardly to lift the sheet as it is released by the grippers, a series of continuously driven rollers beyond the stripping fingers, a plurality of transversely adjustable rollers above the first rollers of the said series, a series of top guide fingers above said series of constantly driven rollers, and extending between and past said transversely adjustable rollers and also extending above the stripper fingers and the impression cylinder when the sheet is released therefrom.

24. A printing press including in combination, a traveling impression cylinder, a relatively stationary sheet delivery mechanism arranged to cooperate with the impression cylinder near one end of its travel, means mounted on the delivery mechanism for stripping the sheets from the impression cylinder as the latter approaches the

limits of its travel toward the delivery mechanism and a support for the delivery mechanism such that the delivery mechanism may be moved away from the impression cylinder.

25. A printing press including in combination, a traveling impression cylinder, a relatively stationary sheet delivery mechanism arranged to cooperate with the impression cylinder when near one end of its travel, means mounted upon the delivery mechanism and rendered operative by the traveling movement of the impression cyl-

inder for stripping the sheets from the impression cylinder, and means for supporting the delivery mechanism whereby the latter may be moved away from the impression cylinder to expose the latter for making ready purposes. 15

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses. 20

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Witnesses:

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JOHN CONAHEY.