H. M. BARBER.

FLAT SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED APR. 22, 1918.

1,357,680.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 1.

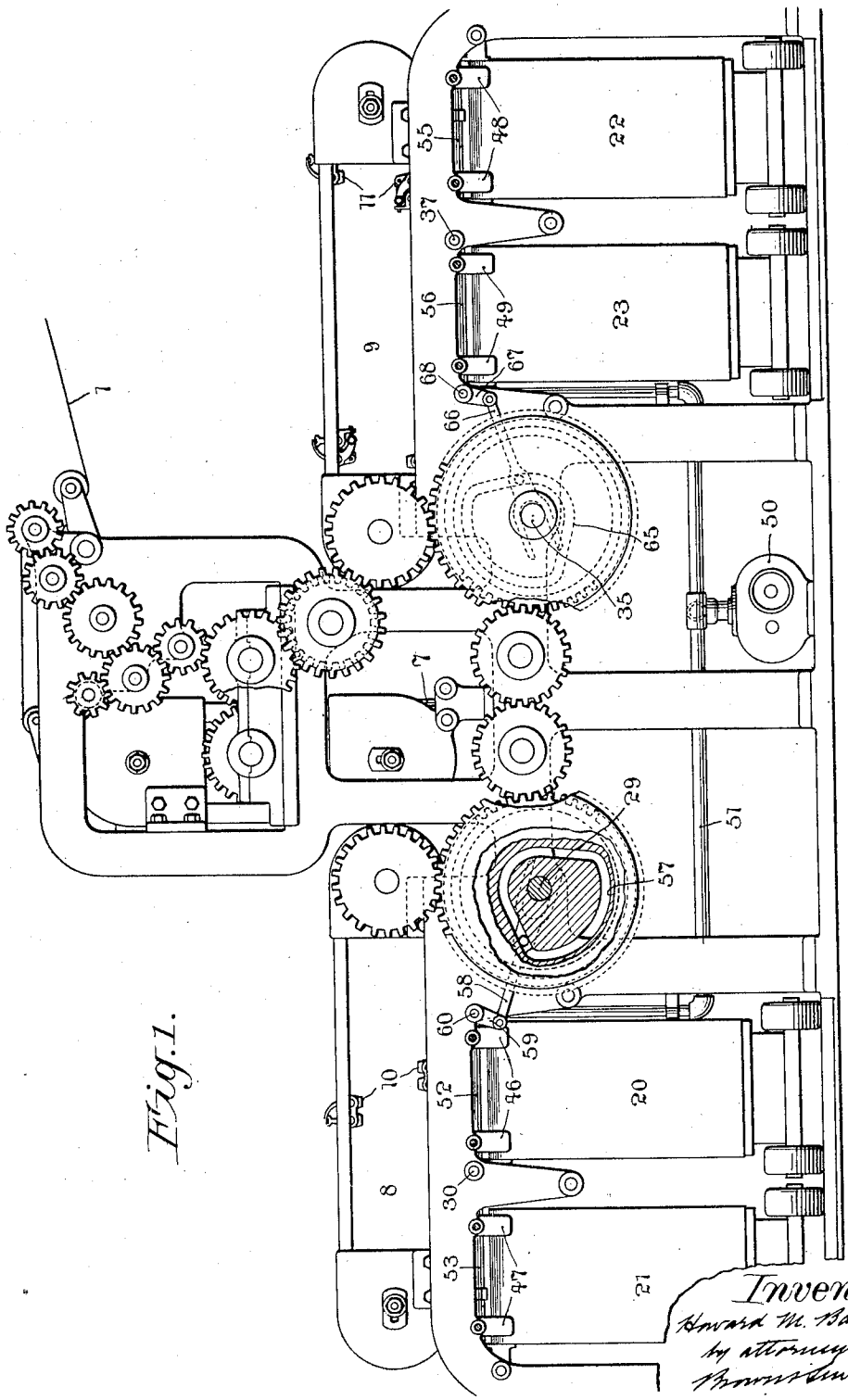


Fig. 1.

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Howard M. Barber
by attorneys
Brown & Ward

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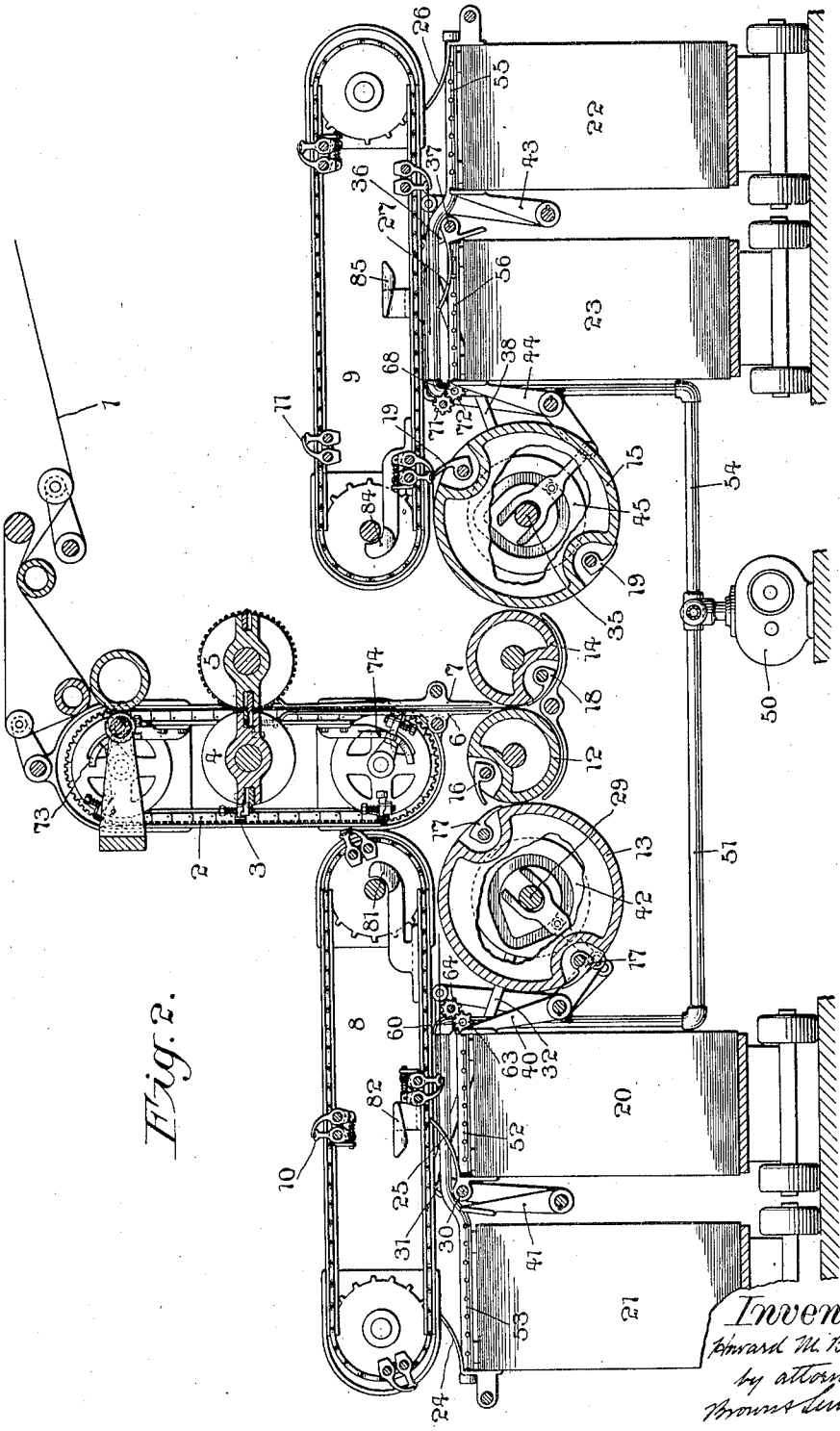


Fig. 2.

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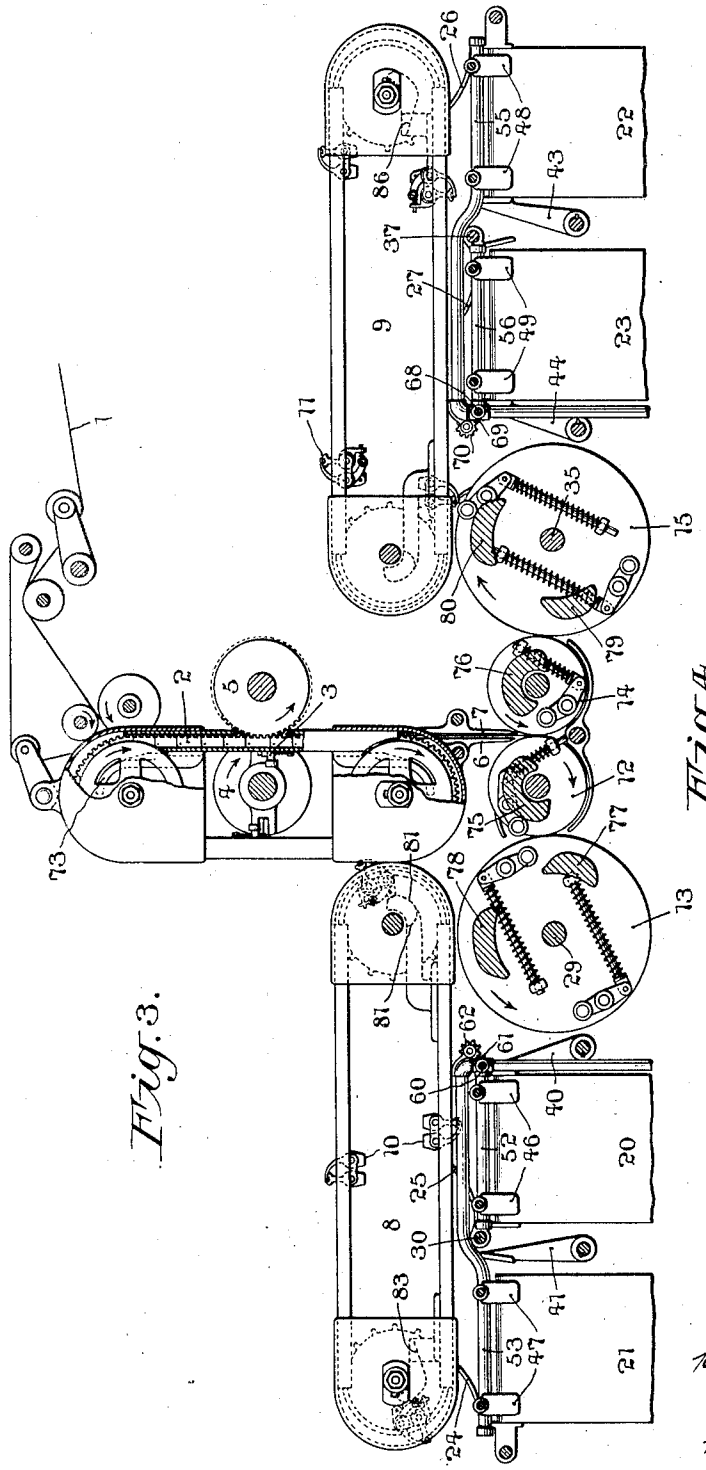


Fig. 3.

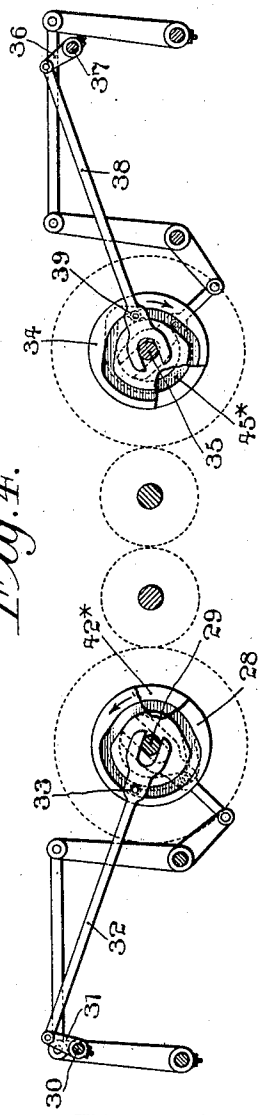


Fig. 4.

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UNITED STATES PATENT OFFICE.

HOWARD M. BARBER, OF STONINGTON, CONNECTICUT, ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

FLAT-SHEET-DELIVERY MECHANISM FOR PRINTING-PRESSES.

1,357,680. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed April 22, 1918. Serial No. 230,065.

To all whom it may concern:

Be it known that I, HOWARD M. BARBER, a citizen of the United States, and resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Flat-Sheet-Delivery Mechanism for Printing-Presses, of which the following is a specification.

The object of my invention is to provide means whereby sheets may be rapidly delivered flat and in piles in such a manner that they will not smut or stick together.

My invention is particularly applicable for the rapid handling of sheets perfected in heavy color or black, transfer means being employed to forward alternate sheets in opposite directions and to deposit the sheets traveling in each direction alternately to front and rear piles and for subjecting the sheets after they are deposited to blasts of air to prevent the sheets from settling too rapidly and for accelerating the oxidation of the ink thereon.

A practical embodiment of my invention is represented in the accompanying drawings in which,

Figure 1 represents the machine in side elevation.

Fig. 2 is a vertical longitudinal central section through the machine.

Fig. 3 is a detail vertical longitudinal section taken in a plane adjacent to the near side frame, and

Fig. 4 is a detail section showing the cams for controlling the movements of the joggers and sheet stops.

The traveling web 1 is fed to a vertically arranged endless carrier 2, the side chains of which are provided with side grippers 3 arranged to grasp the side edges of the web and feed it to and through the pair of coacting rotary cutters 4, 5, and between the sheet guides 6, 7. Two horizontally arranged endless delivery carriers 8, 9, have their side chains provided with sets of end grippers 10 and 11 respectively. Means are provided for forwarding the sheets alternately to the grippers 10 and 11 of the endless delivery carriers, which means are herein shown as comprising two pairs of transfer cylinders 12, 13, and 14, 15, respectively, the transfer cylinder 12 being shown as provided with a pair of end grippers 16 arranged to take a sheet from the guide 6, 7, and transfer it to one of the grippers 17, which grippers 17 are arranged to transfer the sheet to one of the sets of grippers 10 of the endless delivery carrier 8. The set of grippers 18 on the transfer cylinder 14 is arranged to take the next succeeding sheet from the guide 6, 7, and transfer it to one of the sets of grippers 19 on its coacting cylinder 15 and the grippers 19 transfer the sheet to one of the grippers 11 of the endless delivery carrier 9. The endless delivery carrier 8 is arranged to deposit the sheets alternately on to the front and rear piles 20, 21, arranged one before the other in the line of travel of the sheets and the endless delivery carrier 9 is arranged to deposit alternate sheets upon the front and rear piles 22, 23, arranged one before the other in the line of travel of the sheets.

A fixed sheet stop 24 is provided for the rear pile 21 and a movable sheet stop 25 is provided for the front pile 20. A fixed sheet stop 26 is provided for the front pile 22 and a movable sheet stop 27 is provided for the rear pile 23. Means are provided for moving the sheet stop 25 to permit alternate sheets being delivered by the endless delivery carrier 8 to pass over the sheet stop 25 of the front pile 20 into position to be engaged by the fixed sheet stop 24 of the rear pile 21, and similar means are provided for controlling the movement of the stop 27 to permit alternate sheets being delivered by the endless carrier 9 to pass over the sheet stop 27 of the rear pile 23 into engagement with the fixed sheet stop 26 of the front pile 22. The movement of the sheet stop 25 for the front pile 20 is controlled by a box cam 28 on the shaft 29 of the second transfer cylinder 13 of one group, by providing the rock shaft 30 of the movable stop with an arm 31 to which is connected a rod 32 carrying a stud or roller 33 arranged to travel in a groove of said box cam. Similarly, the movable stop 27 for the rear pile 23 is operated by a box cam 34 on the shaft 35 of the second transfer cylinder 15 of the other group, through an arm 36 carried by the rock shaft 37 of the movable stop, and a bar 38 connected to said arm and having a stud or roller 39 traveling in the groove of said box cam 34.

The front joggers 40 for the pile 20 and the front joggers 41 for the pile 21, are operated from the box cams 42, 42* on the shaft 39 of the second transfer cylinder 13, by the usual means, which will not be specifically described herein. The back joggers 43 of the pile 22 and the back joggers 44 for the pile 23, are operated by the box cams 45, 45*, on the shaft 35 of the second transfer cylinder 15, by the usual means, which will also not be specifically described herein. The side joggers 46, 47, for the piles 20, 21, and the side joggers 48, 49, for the piles 22, 23, are operated by well known and approved means which have not been illustrated and will not be described herein as the mechanism therefor would only complicate the drawings it is believed, unduly.

I have provided means for subjecting the top of each pile of sheets to blasts of air after the sheet has been deposited thereon and jogged, to prevent the too rapid settling of the sheet and to facilitate the oxidation of the ink thereon. In the present instance, I have shown a blower 50 from which a pipe 51 leads to two pairs of branch pipes 52, 53, located along and above the opposite sides of the front and rear piles 20, 21, in position to direct jets of air inwardly. Similarly, a pipe 54 leads to two pairs of branch pipes 55, 56, arranged along opposite sides of and above the piles 22, 23, in position to direct jets of air inwardly.

A box cam 57 on the shaft 29 controls, through the rod 58, rock arm 59, shaft 60 and gears 61, 62, 63, 64, three-way valves, not shown, for opening and closing communication to the pairs of air blast pipes 52, 53. Similarly, a box cam 65, controls, through the rod 66, rock arm 67, shaft 68 and gears 69, 70, 71, 72, three-way valves, not shown, for opening and closing communication to the pairs of air blast pipes 55, 56. It is to be understood that the timing of these cams 57 and 65 is such that the blast will be cut off from that pile on which a sheet is being deposited and turned on to that pile upon which a sheet has been deposited and jogged, thus permitting the accurate delivery of the sheets on to the piles unaffected by the blasts of air.

The upper and lower pairs of cams for controlling the operation of the side grippers on the endless carrier 2, are designated by 73, 74, the cams 73 being arranged to cause the grippers to grasp the side edges of the web and carry the web through the coacting rotary cutters 4, 5. The pairs of cams 74 are arranged to open the side grippers 3 to release the sheets as they are taken by the grippers 16 or 18 of the first transfer cylinders 12 and 14, as the case may be. The cams for controlling the operation of these grippers 16 and 18 are denoted by 75, 76. The cams for controlling the operation of the grippers 17 of the second transfer cylinder 13 to receive the sheets from the first transfer cylinder 12 and transfer them to the grippers 10 of the endless delivery carrier 8, are designated by 77, 78. Similar cams for controlling the operation of the grippers 19 of the second transfer cylinder 15 are designated by 79, 80. There are two cams 81 upon opposite sides of the endless carrier 8 for controlling the operation of each set of grippers 10 to take a sheet from the grippers 17. There is one cam 82 at one side of the endless carrier 8 for operating alternate sets of grippers 10 to cause them to deposit their sheets onto the front pile 20. There is one cam 83 at the other side of the endless carrier 8 for controlling the operation of the other set of alternate grippers 10 for causing them to deposit their sheets onto the pile 21. Similarly, the grippers 11 of the endless delivery carrier 9 have the two cams 84, for controlling the operation of all of the grippers to receive the sheets from the grippers 19 of the second transfer cylinder 15, and they are also provided with one cam 85 for controlling the operation of the set of alternate grippers for delivering the sheets onto the pile 23 and the other cam 86 for controlling the other set of alternate grippers to deposit their sheets onto the pile 22.

I have not thought it necessary to illustrate the table lowering mechanism for the several piles as it is to be understood that any well known or approved means may be employed for this purpose.

From the above description it will be seen that as the traveling web is fed to the machine, it is passed through the coacting rotary cutters and the sheets which are cut from the traveling web are alternately passed through the two transfer mechanisms to their respective endless delivery carriers. Each of these endless delivery carriers deposits alternate sheets on its front and rear piles. After the sheets have been deposited and properly jogged, the sheets are subjected to blasts of air which will retard the settling of the sheets onto the piles and facilitate the oxidation of the ink on the sheets. By delivering the sheets alternately in opposite directions and by depositing the sheets traveling in each direction alternately to different piles, I am enabled to secure a very rapid delivery of the sheets and at the same time give each sheet a considerable period to dry, thus rendering the mechanism particularly well adapted for use in the delivery of sheets perfected in heavy black or color where there would be a liability to smut and stick if the sheets were delivered to either one or two piles. It also permits the subjection of each sheet to a blast of air of appreciable length.

It is evident that various changes may be

resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the structure herein set forth, but

What I claim is:

1. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions and delivery means for depositing the sheets traveling in each direction in front and rear piles.

2. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets alternately in opposite directions and delivery means for depositing the sheets traveling in each direction in front and rear piles.

3. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions and delivery means for depositing the sheets traveling in each direction alternately in front and rear piles.

4. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets alternately in opposite directions, and delivery means for depositing the sheets traveling in each direction alternately in front and rear piles.

5. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions, delivery means for depositing the sheets in each direction in front and rear piles, and means for subjecting the sheets to air blasts after the sheets have been deposited on their respective piles, to prevent the too rapid settling of the sheets and to facilitate the oxidation of the ink thereon.

6. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions, delivery means for depositing the sheets in each direction in front and rear piles, means for subjecting the sheets to air blasts as they are settling on their respective piles, and means for shutting off the air blasts as the sheets are being deposited onto their respective piles.

7. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, means for jogging said sheets in each pile, and means for subjecting the sheets to air blasts as they are settling on their respective piles.

8. A flat sheet delivery mechanism including sheet forwarding means, means for transferring the sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, means for jogging said sheets in each pile, means for subjecting the sheets to air blasts as they are settling on their respective piles, and means for shutting off the air blasts as the sheets are being deposited onto their respective piles.

9. A flat sheet delivery mechanism including means for cutting sheets from a traveling web, means for transferring sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, and means for subjecting the sheets to air blasts after the sheets have been deposited on their respective piles, to prevent the too rapid settling of the sheets and to facilitate the oxidation of the ink thereon.

10. A flat sheet delivery mechanism including means for cutting sheets from a traveling web, means for transferring the sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, means for subjecting the sheets to air blasts after the sheets have been deposited on their respective piles, to prevent the too rapid settling of the sheets and to facilitate the oxidation of the ink thereon, and means for shutting off the air blasts as the sheets are being deposited onto their respective piles.

11. A flat sheet delivery mechanism including means for cutting sheets from a traveling web, means for transferring the sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, means for jogging said sheets in each pile and means for subjecting the sheets to blasts of air after they have been deposited on their respective piles to prevent the too rapid settling of the sheets and to facilitate the oxidation of the ink thereon.

12. A flat sheet delivery mechanism including means for cutting sheets from a traveling web, means for transferring the sheets in opposite directions, delivery means for depositing the sheets traveling in each direction in front and rear piles, means for jogging said sheets in each pile, means for subjecting the sheets to blasts of air after they have been deposited on their respective piles, to prevent the too rapid settling of the sheets and to facilitate the oxidation of the ink thereon, and means for shutting off the air blasts as the sheets are being deposited onto their respective piles.

13. A flat sheet delivery mechanism including sheet forwarding means, two oppositely arranged endless delivery carriers, and two pairs of coacting rotary transfer carriers arranged to forward sheets to their respective endless delivery carriers, each endless delivery carrier being arranged to deposit sheets onto front and rear piles.

14. A flat sheet delivery mechanism including web forwarding means, coacting ro-

tary cutters, an endless carrier arranged to take the web and carry it through the cutters, two oppositely arranged endless delivery carriers, and two pairs of coacting rotary transfer carriers arranged to forward sheets to their respective endless delivery carriers, each of said endless delivery carriers being arranged to deposit the sheets onto front and rear piles.

In testimony that I claim the foregoing as my invention I have signed my name this sixteenth day of April, 1918.

HOWARD M. BARBER.