No. 867,424. PATENTED OCT. 1, 1907.

W. & D. J. SCOTT.

DELIVERY MECHANISM.

APPLICATION FILED JUNE 18, 1904.

2 SHEETS—SHEET 1.

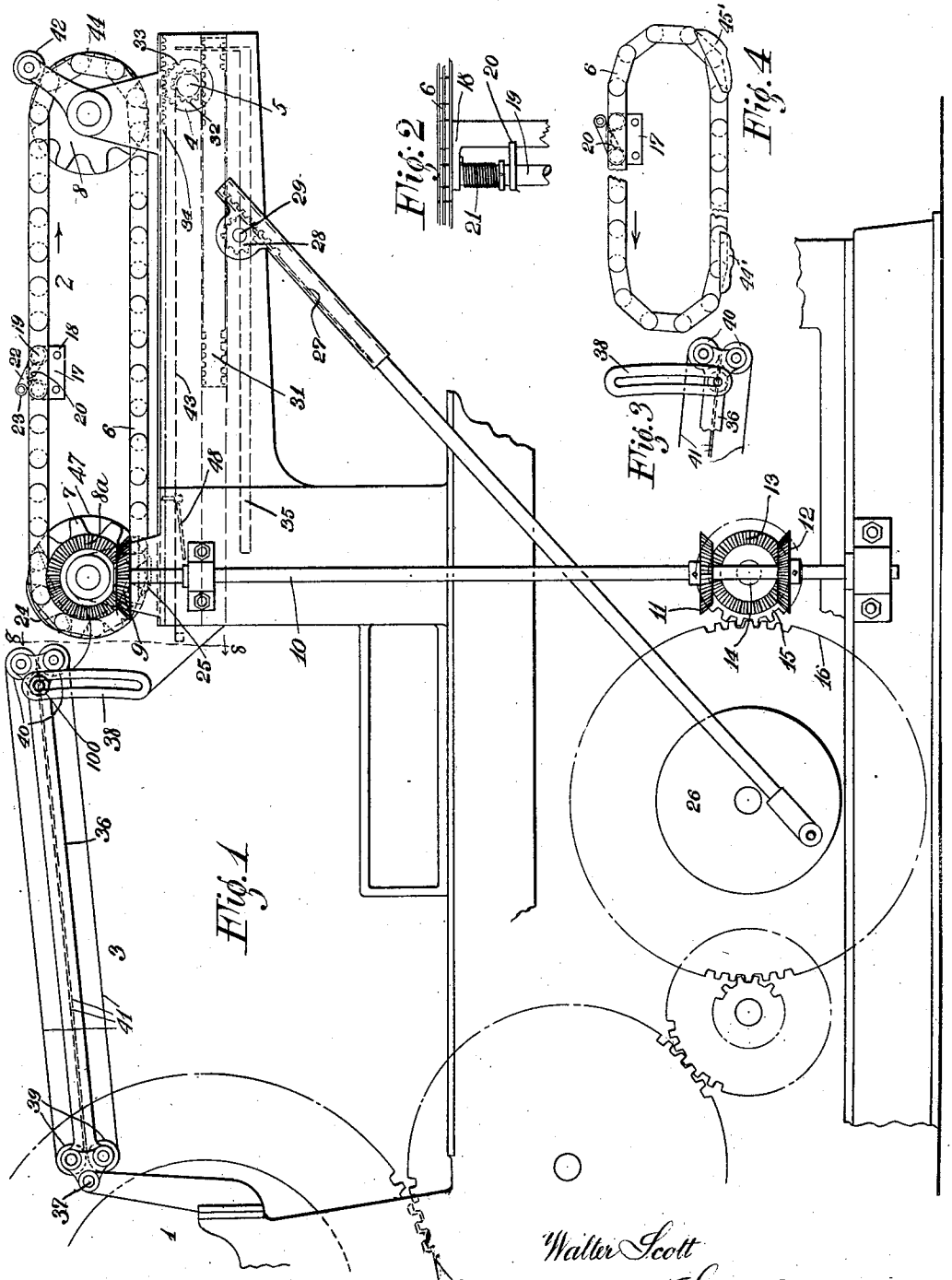


Fig. 1

Fig. 2

Fig. 4

Fig. 3

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2 SHEETS—SHEET 2.

Fig. 7.

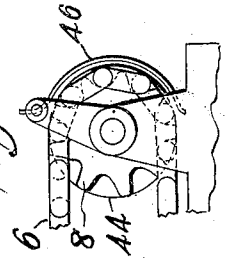


Fig. 6

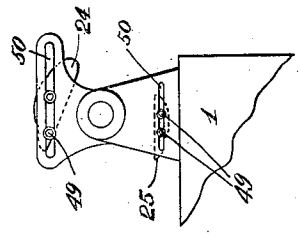


Fig. 8.

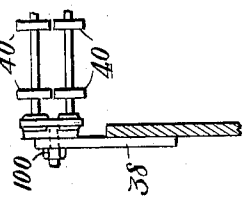
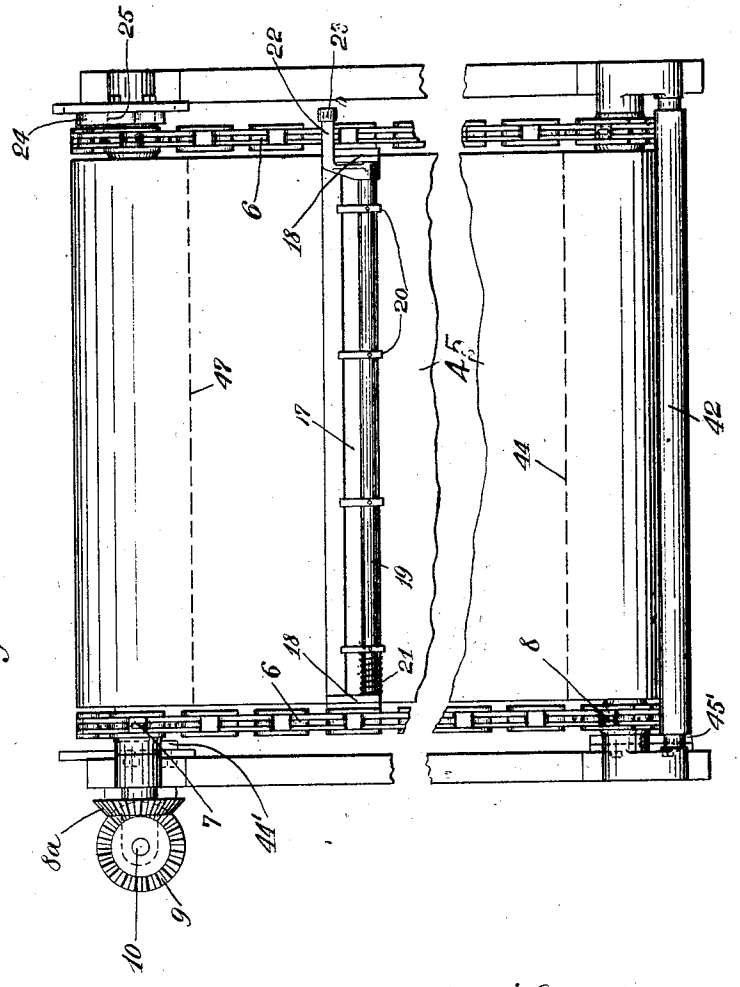


Fig. 5



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UNITED STATES PATENT OFFICE.

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DELIVERY MECHANISM.

No. 867,424. Specification of Letters Patent. Patented Oct. 1, 1907.

Application filed June 18, 1904. Serial No. 213,084.

To all whom it may concern:

Be it known that we, WALTER SCOTT and DAVID JOHN SCOTT, citizens of the United States of America, and residents of Plainfield, Union county, New Jersey, have invented certain new and useful Improvements in Delivery Mechanisms, of which the following is a specification.

Our invention relates generally to delivery mechanisms for sheets of paper or other flexible material, and has more particular reference to sheet delivery mechanisms used in printing presses.

In the class of printing machines known as "two revolution," "stop cylinder" and similar machines, the printed sheets are generally delivered with the printed side up, sometimes, however, it is desirable to deliver the sheets with the printed side down. Furthermore, it is frequently desired to change from one style of delivery apparatus to another in the same machine, when doing different classes of work.

The object of our invention is to produce an improved structure of the character described, capable of delivering the sheets with the printed side down, and adjustable so that the sheets can be delivered either with the printed side up or down at will in the same machine.

In carrying out the above objects, the invention is characterized by a reciprocating delivery and means for delivering sheets thereto either side up. These latter means preferably take the form of an endless conveyer.

The invention is further characterized by an endless conveyer having a gripper frame with grippers for seizing and releasing the sheet. Any other means instead of grippers could be used for seizing the sheet and the claims should be so construed. Adjustable means are provided for driving the said endless conveyer in either direction dependent upon whether the sheet is delivered with the printed side up or down. The grippers or other means for seizing and releasing the sheet are further adjustable to correspond with the direction of movement of the endless conveyer. To open the grippers at the proper moment to seize and release the sheet, there are provided two sets of cams, one set on either side of the machine which coöperate with a roller on the gripper shaft. When the printed side down delivery is used, one cam is mounted adjacent to the upper surface of the endless conveyer and at the feeding point of the latter, and another cam is located adjacent to the under surface of the conveyer at some suitable delivery point. When the printed side up delivery is used one cam is located adjacent to the under surface of the endless conveyer and at the feeding point, while the second cam is located also on the underside of the conveyer but at the forward end at some suitable delivery point. The two cams belonging to each set of cams are located on the same side of the machine so that all four cams can be retained in position at all times, thereby rendering it necessary only to reverse the gripper frame and roller for coöperating with the cams when changing from one style of machine to another.

In connection with the endless conveyer, we provide means for conveying the sheets to said conveyer which are adjustable so that the sheets are delivered either on top or to the underside of the said endless conveyer to correspond to the up or down delivery. This conveying means will preferably take the form of a sheet path or tapes pivoted adjacent to the cylinder of the printing press, and adjustably secured adjacent to the endless conveyer.

The endless conveyer carrying the grippers does not run as fast as the impression cylinder and sheet conveying means. It is therefore some times desirable to have the grippers seize the sheet at a point some distance away from the receiving point, thereby lessening the force of the sheet as it strikes against the stop on the grippers, and allowing the sheet to slip or slide onto the endless conveyer. For this reason we mount the cams adjustably so that both the receiving point of the grippers and the delivery point are variable.

When the sheet is delivered to the top of the endless conveyer, it is necessary to have some supporting means for the body of the sheet as rods or tapes or an endless belt. It is also necessary to provide suitable means for guiding the sheet at the forward end of the endless conveyer as the sheet is turned over, and to provide an adjustable stop to prevent the sheet from being carried with the grippers after the latter release the same. Below the endless conveyer we mount a reciprocating carriage provided with a roller adapted to unwind a collapsible apron as the sheet is delivered on top of the same, and to deliver the sheet from thence to the receiving table. The parts are so arranged that the same apron can be used whether we use the up or down delivery.

In the accompanying drawings we have embodied our invention in a suitable form, though the invention is not limited to the precise structure shown.

In the said drawings: Figure 1 is a general view of the delivery mechanism of a printing machine embodying our invention. Fig. 2 is a plan detail view showing the spring for keeping the gripper normally closed. Fig. 3 shows the sheet path or conveying means between the impression cylinder and the endless conveyer adjusted to deliver the sheets to the underside of the said endless conveyer. Fig. 4 shows the endless conveyer, gripper, and cams for delivering the sheets with the printed side up. Fig. 5 is a plan view. Fig. 6 is a detail view of one of the adjustable cams. Fig. 7 shows a modification. Fig. 8 is a detail

sectional view of the means for securing the adjustable conveying means in either position taken on the line 8—8 of Fig. 1.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates the impression cylinder of a printing machine, 2 the endless conveyer, 3 the adjustable conveying means between the impression cylinder and endless conveyer, and 4 the reciprocating carriage mounting the roller 5.

The endless conveyer in the present instance takes the form of endless chains 6, to which motion is imparted by means of the sprockets 7 and 8. Mounted on the same shaft with the sprocket wheel 7 is a bevel gear 8^a, meshing with the bevel gear 9 mounted on the upright shaft 10, carrying two bevel gears 11 and 12 which are adjustable into and out of engagement with the bevel gear 13, mounted on the transverse stud 14, and receiving its motion by means of the pinion 15, meshing with the gear 16, to which latter motion is imparted in any suitable way. The gearing is so arranged that the endless conveyer will make one complete movement to every two revolutions of the impression cylinder. The bevel gears 11 and 12 are so arranged that when one gear is in engagement with the gear 13, the other gear is moved out of mesh with the same.

Mounted on the chains 6, is a gripping mechanism 17 in the form of a carriage 18, carrying a gripper shaft 19, provided with a plurality of grippers 20 which are normally held closed by the spring 21, wound around the gripper shaft and fastened to the framework. These grippers are adapted to be opened by means of the arm 22 and roller 23 engaging with the cams 24 and 25.

The reciprocating carriage 4 is driven in any suitable way, and operates once to every two revolutions of the impression cylinder in the same way as the endless conveyer. In other styles of machine, these two elements would make one complete movement to every impression, or if a collecting cylinder be used, to every pack of sheets delivered. In the present instance, the said reciprocating carriage and roller 5 are operated from the disk 26, carrying the rack 27, meshing with the pinion 28, mounted on the shaft 29, meshing with the sliding rack 31, which is in engagement with the pinion 32, of the reciprocating carriage 4, the said reciprocating carriage also having the gears 33 meshing with the stationary racks 34.

35 is the delivery board or receiving table located below the reciprocating carriage and roller 5.

Interposed between the impression cylinder and the endless conveyer is the conveying means 3, as heretofore noted, adjustable to deliver the sheets either on top or to the underside of the endless conveyer. In the present instance this conveying means take the form of side bars 36, pivoted adjacent to the impression cylinder on the pivot 37, and adapted to be adjustably secured in the slotted member 38, adjacent to the endless conveyer by means of the bolt 100. The side bars carry rollers as 39 and 40 mounting tapes 41 for conveying the sheet on the impression cylinder to the endless conveyer.

In Fig. 1 the parts are shown adjusted so that the sheet will be delivered with the printed side down. That end of the adjustable conveying means which is adjacent to the endless conveyer is moved to its uppermost position so that the sheets can pass freely on top of the said endless conveyer. The bevel gear 12 is moved into engagement with the gear 13 so that the endless conveyer moves in the direction of the arrow shown in Fig. 1. The gripping mechanism 17 is so adjusted that it will receive the sheet as it passes from the adjustable conveying means to the endless conveyer. The cam 24 is, in the present instance, located adjacent at the upper side of the endless chain, and adjacent to the point of feeding, while the cam 25 is located at the underside of the endless chain, adjacent to the delivery point. The sheet as it passes from the impression cylinder will travel over the tapes 41 to the top of the endless conveyer. At this moment, the gripping mechanism 17 will be at the feeding point of the said conveyer and at its upper side, the cam 24 acting to open the gripping mechanism as it receives the sheet. As the gripping mechanism travels forward, the spring 21 will close the said gripping mechanism and hold the sheet securely, causing it to travel over the top of a suitable support as the endless belt 45. Adjacent to the forward end of the said endless conveyer, and on top of the same, there is a friction roll or rolls 42 which serve to guide the sheet as it is turned around by the gripping mechanism, and to confine it against the cylinder 44. Instead of the roll 42, we can employ a guide as 46 adjacent to the cylinder 44. The said cylinder 44 and another cylinder 47 may be used to carry the endless belt or sheet support. When the gripping mechanism 17 has reached the rearward end of the endless conveyer, and at the underside of the same, the cam 25 will open the gripping mechanism and release the sheet. At this moment, the apron 43 will be unwound and the sheet will drop on the same. As the reciprocating carriage and roller 5 return, the apron will be rewound and the sheet will drop on the delivery board 35. To stop the sheet at the proper point I provide an adjustable stop 48 interposed between the endless conveyer and the collapsible apron.

When it is desired to deliver the sheets with the printed side up, the sheet path will be adjusted so as to deliver the sheets to the underside of the endless conveyer as shown in Fig. 3. The gripper frame or carriage 18 will be reversed as indicated in Fig. 4, and the roller 23 will engage with the cams 44^1 and 45^1 which are both located at the under surface of the endless conveyer, and respectively at the feeding point and at the forward end of the endless conveyer and on the other side of the machine from the cams 24 and 25. The bevel gear 11 will be moved into engagement with the gear 13, and the gear 12 moved out of mesh with the latter. The sheet, as it comes from the impression cylinder, will be delivered to the underside of the endless conveyer where it is seized by the gripping mechanism which is opened at that point, and be drawn out until the gripping mechanism reaches the cam 45^1, when the sheet is released. The apron 43 will be unwound at this time, and will receive the sheet and in turn deliver it to the delivery board as it rewinds. Both sets of cams 24 and 25 and 44^1 and 45^1 can always be in the proper position so that when it is desired to change from an up to a down delivery or vice versa it is only necessary to reverse the gripper frame or carriage.

To make the cams adjustable, we provide the same

with bolts 49 adjustable in the slots 50 on the framework.

What we claim is:

1. In a printing or other machine, the combination with an endless conveyer, of adjustable means for conveying the sheet to the top or underside of the said endless conveyer, means for driving the endless conveyer in either direction, a gripping mechanism carried by the endless conveyer adjustable to correspond to the direction of movement of the endless conveyer, means for opening and closing the gripping mechanism whereby the sheet can be delivered with the printed side up or down in the same machine.

2. In a printing or other machine, the combination with an endless conveyer, of adjustable conveying means for conveying the sheet to the top or underside of the said endless conveyer, means for driving the said endless conveyer in either direction, an adjustable gripping mechanism traveling with the said conveyer for seizing the sheet at the feeding point, and two sets of cams for releasing the sheet at the delivery point depending upon the direction of movement of the endless conveyer.

3. In a printing or other machine, the combination with an endless conveyer, of adjustable conveying means for conveying the sheet to the top or underside of the said endless conveyer, means for driving the said endless conveyer in either direction, an adjustable gripping mechanism traveling with the said conveyer for seizing the sheet at the feeding point, two sets of cams for releasing the sheet at the delivery point depending upon the direction of movement of the endless conveyer, a collapsible apron below the endless conveyer for receiving the sheet from the endless conveyer, and a delivery board below the apron for receiving the sheet from the said apron.

4. In a printing or other machine, the combination of a cylinder, an endless conveyer, side bars carrying rollers for tapes or the like interposed between the cylinder and endless conveyer, a pivot supporting said bars adjacent to the cylinder, and means for adjustably securing the said bars adjacent to the endless conveyer to deliver the sheets either to the top or underside of the said endless conveyer.

5. In a printing or other machine, the combination with an endless conveyer, of a gripping mechanism carried by the same for delivering the sheet with the printed side down, means for causing the said gripping mechanism to seize the sheet at the feeding point of the said conveyer, means for causing the said gripping mechanism to release the sheet after it is turned over, a collapsible apron below the endless conveyer for receiving the sheet from the endless conveyer, and means below the apron for receiving the sheet from the said apron.

6. In a printing or other machine, the combination with an endless conveyer, of means for conveying the sheet to the top of the said endless conveyer, a gripping mechanism carried by the said endless conveyer for delivering the sheet with the printed side down, means for causing the said gripping mechanism to seize the sheet at the feeding point of the said conveyer, means for causing the said gripping mechanism to release the sheet after it is turned over, a collapsible apron below the endless conveyer for receiving the sheet from the endless conveyer, and means below the apron for receiving the sheet from the said apron.

7. In a printing or other machine, the combination with an endless conveyer, of a gripping mechanism carried by the same for delivering the sheet with the printed side down, means for causing the said gripping mechanism to seize the sheet at the feeding point of the said conveyer, means for causing the said gripping mechanism to release the sheet after it is turned over, a collapsible apron below the endless conveyer for receiving the sheet from the endless conveyer, means below the apron for receiving the sheet from the said apron, and a stop interposed between the endless conveyer and apron for preventing the sheet from adhering to the gripping mechanism.

8. In a printing or other machine, the combination with an endless conveyer, of means for conveying the sheet to the top of the said endless conveyer, a gripping mechanism carried by the said endless conveyer for delivering the sheet with the printed side down, means for causing the said gripping mechanism to seize the sheet at the feeding point of the said conveyer, means for causing the said gripping mechanism to release the sheet after it is turned over, a collapsible apron below the endless conveyer for receiving the sheet from the endless conveyer, means below the apron for receiving the sheet from the apron, and a stop interposed between the endless conveyer and apron for preventing the sheet from adhering to the gripping mechanism.

9. In a printing or other machine, the combination with an endless conveyer, of adjustable conveying means for conveying the sheet to the top or underside of the said endless conveyer, means for driving the said endless conveyer in either direction, a reversible gripper frame having grippers traveling with the said conveyer, two sets of cams, one set on each side of the machine for opening the grippers to seize and release the sheet, the set of cams used depending upon the direction of movement of the endless conveyer and the adjustment of the gripper frame.

10. In a printing or other machine, the combination with an endless conveyer, of adjustable conveying means for conveying the sheet to the top or underside of the said endless conveyer, means for driving the said endless conveyer in either direction, a reversible gripper frame having grippers traveling with the said conveyer, two sets of adjustable cams, one set on each side of the machine for opening the grippers to seize and release the sheet, the set of cams used depending upon the direction of movement of the endless conveyer and the adjustment of the gripper frame.

11. In a delivery mechanism, the combination of means for turning over the sheet, of a collapsible apron adapted to receive the sheet therefrom, and sheet conveying means for conveying the sheet to the means for turning the same over.

12. In a delivery mechanism, the combination of a delivery board, means for turning the sheet, and a collapsible apron adapted to receive the sheet from the means for turning the same over and to deliver it to the board.

13. In a delivery mechanism, the combination of a delivery board, means for turning the sheet, a collapsible apron adapted to receive the sheet from the means for turning the same over and to deliver it to the board, and sheet conveying means for conveying the sheet to the means for turning the same over.

14. In a delivery mechanism, the combination of a reciprocating delivery, and means for transferring sheets thereto either side up

15. In a delivery mechanism, the combination of a reciprocating delivery for withdrawing from under sheets to deliver the same, and means for transferring sheets thereto either side up.

16. In a delivery mechanism, the combination of a collapsible apron, and means for transferring sheets thereto either side up.

17. In a delivery mechanism, the combination of a delivery board, a reciprocating delivery mechanism for delivering sheets to the board, and means for delivering sheets with the printed side up or down at will to the said reciprocating delivery mechanism.

18. In a delivery mechanism, the combination of a delivery board, a reciprocating delivery mechanism having a collapsible sheet support for delivering sheets to the board, and means for delivering sheets with the printed side up or down at will to the said reciprocating delivery mechanism.

19. In a delivery mechanism, the combination of a reciprocating delivery, and an endless conveyer for transferring sheets thereto either side up.

20. In a delivery mechanism, the combination of a reciprocating delivery for withdrawing from under sheets to deliver the same, and an endles conveyer for transferring sheets thereto either side up.

21. In a delivery mechanism, the combination of a collapsible apron, and an endless conveyer for transferring sheets thereto either side up.

22. In a delivery mechanism, the combination of a delivery board, a reciprocating delivery mechanism for delivering sheets to the board, and an endless conveyer for delivering sheets with the printed side up or down at will to the said reciprocating delivery mechanism.

23. In a delivery mechanism, the combination of a delivery board, a reciprocating delivery mechanism having a collapsible sheet support for delivering sheets to the board, and an endless conveyer for delivering sheets with the printed side up or down at will to said reciprocating delivery mechanism.

Signed at New York, this 14th day of June, 1904.

WALTER SCOTT.
DAVID JOHN SCOTT.

Witnesses:
AXEL V. BEEKEN,
RAYMOND C. SPAULDING.