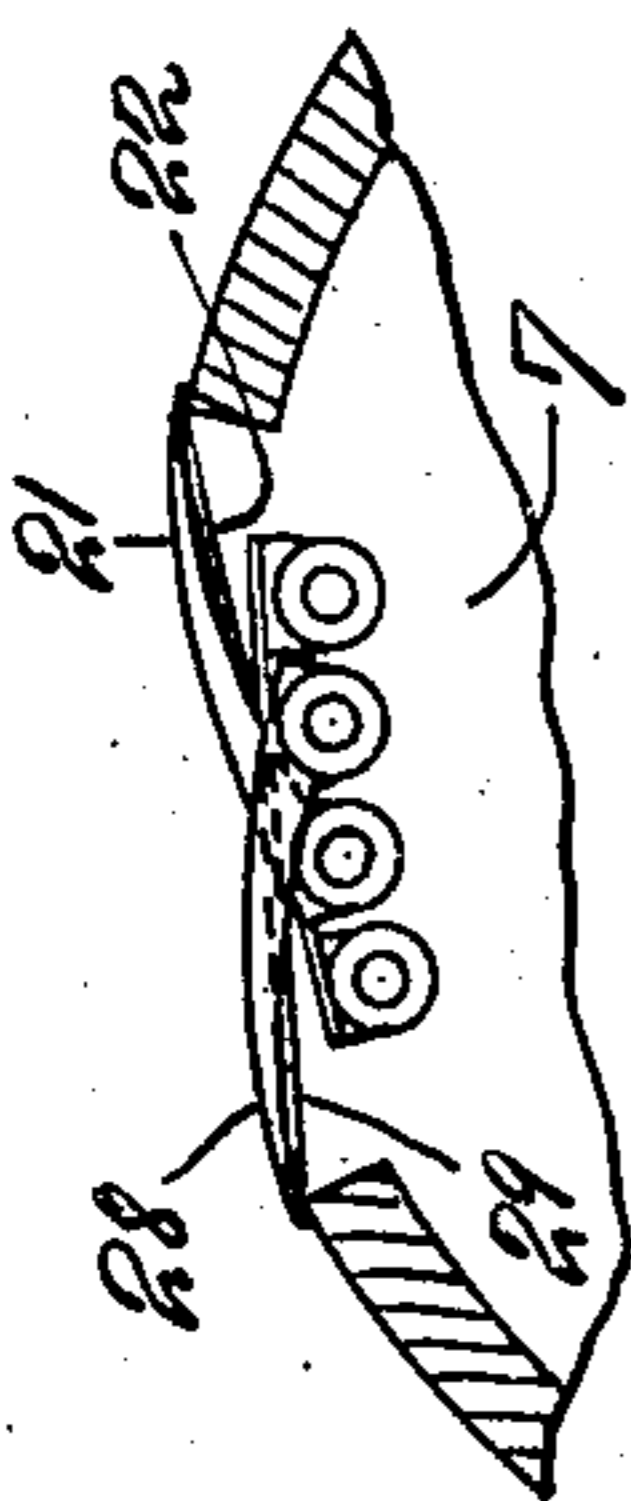
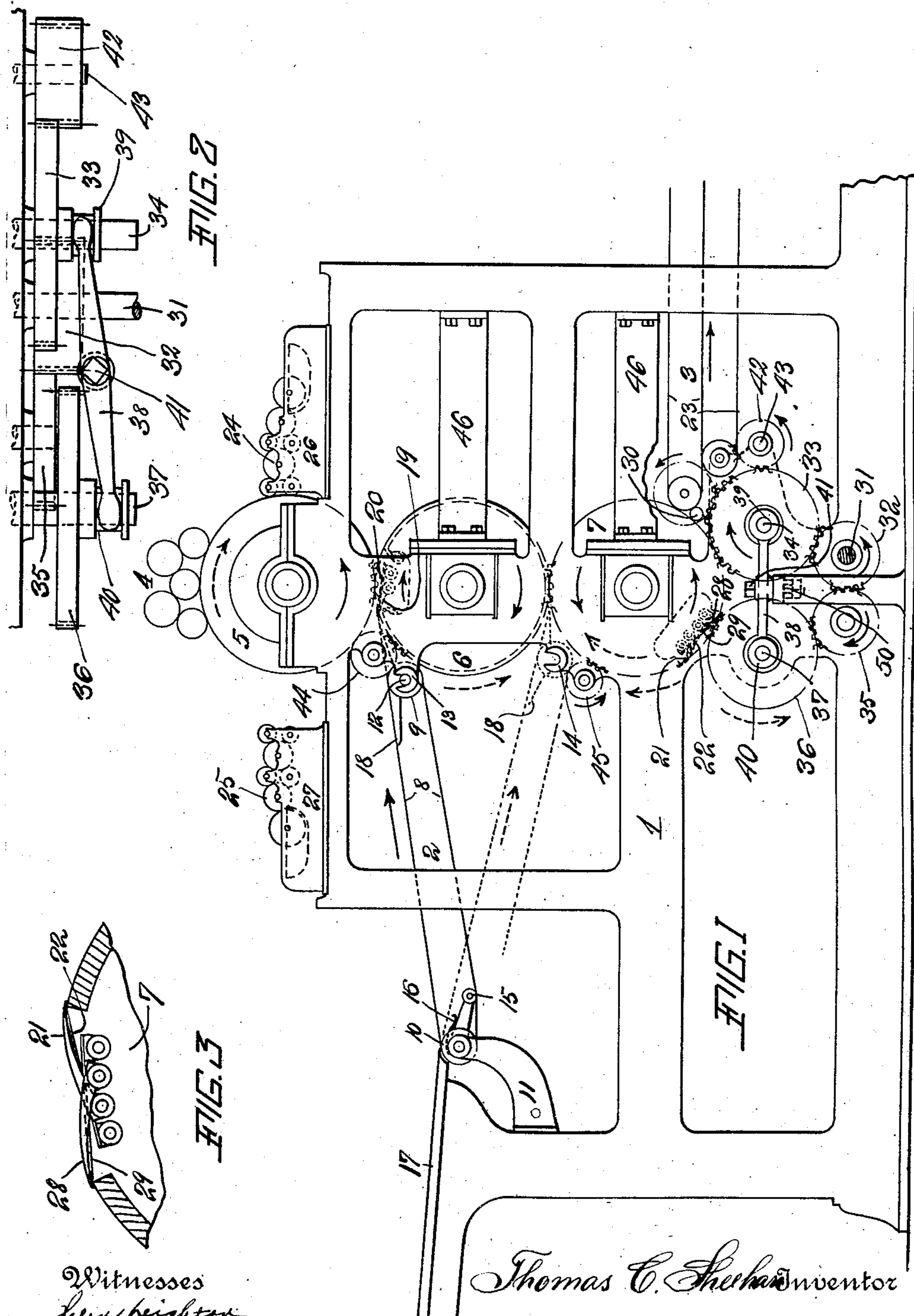


No. 845,586.

PATENTED FEB. 26, 1907.

T. C. SHEEHAN.
PRINTING MACHINE.

APPLICATION FILED APR. 18, 1906.



Witnesses
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PRINTING-MACHINE.

No. 845,586.

Specification of Letters Patent.

Patented Feb. 26, 1907.

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To all whom it may concern:

Be it known that I, THOMAS C. SHEEHAN, a citizen of the United States of America, and a resident of Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

The present invention relates to printing-machines, and consists in certain new and improved arrangement of parts as will produce new and useful results in the art of printing.

The invention refers particularly to certain types of printing-machines in which a so-called "blanket-cylinder" is employed. It is well known and has been demonstrated that it is advantageous and practical for certain classes of work to cover the impression-cylinder of a printing-couple with a rubber blanket and having the sheet receive the impression directly thereon. It has also been found that for other kinds of printing it produces better results to have the blanket-cylinder act as an impression-transfer cylinder and have the sheet pass between it and a third cylinder, which then acts as the impression-cylinder proper. The blanket-cylinder in this instance acts as a printing member. These facts are well known and old in the art, and printing-machines of these different types may be found in successful operation. Now it is obvious that if the method of printing first described—that is, on the sheet directly on the blanket-cylinder—could be used on the three-cylinder machines the usefulness of these latter would be doubled and a saving of space, power, cost, &c., would be effected.

The direct object of this invention is to produce such mechanisms and to so arrange the different parts that the two described methods of printing can be employed on a single machine. This calls for means for changing the direction of rotation of the cylinders, as well as for new and improved gripper mechanism, a feeding device for feeding the sheets to either the blanket-cylinder or to the transfer-cylinder, and delivery mechanism adapted to be constantly driven in the same direction, besides such improved arrangements of parts as will produce the desired result.

The detailed construction of my invention is set forth in the following specification and

illustrated in the accompanying drawing. I do not wish, however, to limit myself to the exact form shown, as changes of course may be made within the scope of the claims.

In the said drawings like parts are designated by like reference-numerals, and Figure 1 is a side elevation of a printing-machine embodying my invention with parts removed. Fig. 2 is a detail view of the gearing, and Fig. 3 is a view of the gripping mechanism.

1 indicates a framework of suitable dimension and design for supporting and mounting the machine.

2 indicates the feeding mechanism, 3 the delivery, and 4 the inking apparatus.

The printing mechanism comprises the form-cylinder or first printing member 5, the blanket-cylinder or second printing member 6, and a transfer-cylinder 7, which when the sheets are fed directly thereto acts as an impression-cylinder.

The feeding mechanism comprises the tapes 8, led over the rolls 9 and 10, which latter are permanently journaled in the bracket 11, while the shaft 12 of the roll 9 rests in the brackets 13 or 14, depending upon to which cylinder the sheets are being fed. In the drawing the tapes are shown dotted in their lower position, and in order to compensate for the difference in distance between the rolls 9 and 10 in the two different positions idlers, as 15, are mounted on the shaft of the rolls 10. These idlers being under tension of the springs 16 serve to keep the tapes taut and to "take up." Any feeding device for feeding the sheets onto the tapes may be used. In the present instance is shown a feed-board 17. Suitable guides, as 18, may be used, bridging between the tapes and the respective cylinders.

In the drawing is shown in full-line arrows the direction of travel of the different parts when the sheets are fed to the blanket-cylinder and the printing takes place directly thereon. The working of the different parts in this instance will now be explained.

The sheet being fed over the tapes in their upper position is seized by the grippers 19 on the blanket-cylinder and passes between it and the form-cylinder and receives the impression. At the right time the throw-off fingers 20 on the said cylinder act, and the sheet is transferred onto the transfer-cylinder 7,

which is provided with the grippers 21 and throw-off fingers 22 and upon which the sheet is carried and transferred onto the delivery-tapes 23, which delivers the sheet to any suitable mechanism. (Not shown.)

Water-rolls 24 and 25 of usual construction, but mounted in slidable carriages 26 and 27, are employed. During the above-described operation the rolls 24 act, while the carriage 27, with the rolls 25, is withdrawn from contact with the form-cylinder.

When it is desired to transfer the impression by means of the blanket-cylinder, the feed-tapes are moved down into the lower position (shown in dotted lines) and the sheet is fed directly to the cylinder 7, which now acts as an impression-cylinder. It is then seized and carried around by means of the grippers 28, while the throw-off fingers 29 act to transfer the sheet onto the delivery-tapes 23, as before. One or more guide-rolls 30 may be employed at this point. When this second method of printing is employed, the water-rolls 24 are withdrawn and the rolls 25 are moved into contact with the form-cylinder.

The direction of travel of the different parts when the second method is employed is indicated by arrows in dotted lines, and it will be seen that it is necessary to reverse the direction of rotation of the cylinder 7 in order to make it act both as a transfer and an impression cylinder, while the feed and delivery tapes must be driven constantly in the same direction.

The mechanism for reversing and the gearing of the different parts are as follows: 31 is the main driving-shaft, to which power is applied in any suitable manner and which carries the wide-faced pinion 32, which meshes with intermediate gear 33 on the shaft 34 and which in turn transmits the motion to the cylinders, which are geared together in the manner shown. This manner of imparting the motion to the cylinders is followed when the sheets are being fed to the blanket-cylinder. When the sheets are fed to the transfer-cylinder, the train of gears is as follows: from the pinion 32 to the pinion 35, to intermediate gear 36, and hence to the cylinders. In order to accomplish this necessary change in the gearing, the intermediate gears 33 and 36 are mounted slidably on their respective shafts 34 and 37 and are moved in and out of mesh with the gear on the cylinder 7 by means of a clutch mechanism comprising the centrally-pivoted arm 38 and the collars 39 and 40 for the two shafts. The arm 38 is mounted by means of the bolt 50, which is provided with the square portion 41, by means of which the arm is turned on its pivot and the gears thrown in or out of mesh with the cylinder-gear. From this it will be understood that a simple and effective

clutch mechanism has been provided for changing the direction of rotation of the cylinders, without which it would be impossible to employ the two methods of printing on a single machine.

Inasmuch as the pinion 32 is a wide-faced pinion, the gear 33 will always rotate in the direction shown, whether or not it is in mesh with the cylinder-gear, and as I provide a wide-faced pinion 42 on the shaft 43 of the delivery-tape rolls the said tapes will always be driven in the same direction as the gear 33 meshes with this pinion 42, as shown in the drawing.

When the feed-tapes are in the upper position, they are driven directly from the blanket-cylinder by means of the intermediate pinion 44; when in the power position, by the pinion 45, so that both the feed and the delivery mechanisms are driven constantly in the same direction without being dependent upon the direction of rotation of the printing mechanism.

It will be noted that the cylinder 7 must be provided with the two sets of opposed gripping mechanisms shown, of which the one acts when the cylinder rotates in the one direction and the other acts when the cylinder rotates in the other direction. The mechanism for operating the gripping mechanisms is not shown, as the same is old and does not form a part of this invention. Of course when it is desired to render the one or the other set of gripping mechanisms inoperative some simple change, such as removing the cam or cam-roll in their actuating mechanisms, will be effected. It will also be seen that this double gripping mechanism will not interfere with the path of the sheet, as the inoperative set is always ahead of the leading edge of the sheet and passes the open space in the adjacent cylinder.

In order to take up the strain on the cylinder-journals, I provide braces, as 46. The said braces are bolted directly on the center line of the cylinder against the journal-box and the frame. I believe this to be a new feature in the design. From the above description it will be clear that while it is not new to print from a form-cylinder to a blanket-cylinder or to transfer the impression by means of the said blanket-cylinder my invention makes it practical and possible to do the two kinds of printing on a single machine.

In the drawings I have illustrated my invention in a concrete form; but I wish it understood that I do not limit myself to the precise form shown, as changes of course may be made within the scope of the claims.

In the claims the terms "form," "blanket," and "transfer-cylinder" are to be construed broadly in connection with the description and the drawing. The term "gripping mech-

anisms" are to be taken as including both the means for seizing the sheet and the means for throwing the sheet off from the cylinder.

What is claimed is—

5 1. In a printing-machine the combination with a printing mechanism comprising a form - cylinder, a blanket - cylinder and a transfer-cylinder and means for printing
10 either between the form and blanket cylinder or between the blanket and transfer cylinder at will.

2. In a printing-machine the combination with a form-carrying member, a printing member and an impression member and
15 means for printing either between the form-carrying member and the printing member or between the printing member and the impression member at will.

3. In a printing-machine the combination
20 with a printing mechanism comprising a form-carrying member, a printing member and an impression member and means for feeding the sheet to the said printing member or to the said impression member at will.

25 4. In a printing-machine a form-carrying member, means for changing the direction of motion of the said member, and means for applying water to the one or the other side of the said member according to the direction
30 of travel of the same.

5. In a printing-machine the combination with a form-cylinder, a blanket-cylinder and a transfer-cylinder, means for feeding the
35 sheet to either the said blanket-cylinder or to the said transfer-cylinder and means carried by the said transfer-cylinder for receiving the sheet either from the said blanket-cylinder or from the said feeding means.

6. In a printing-machine the combination
40 with a printing mechanism comprising a form-carrying member, a printing member and an impression member, means for feeding the sheet to different points of the said printing mechanism at will, and means carried
45 by the said impression member for receiving the sheet either from the said printing member or from the said feeding means.

7. In a printing-machine, the combination
50 with a printing mechanism comprising a

and an impression member, means for feeding the sheet to either the said printing member or to the said impression member, means for changing the direction of rotation of the said printing mechanism and means carried
55 by the said impression member for receiving the sheet either from the said printing member or from the said feeding means according to the direction of rotation of the said printing mechanism.

8. In a printing-machine, the combination with a printing mechanism comprising a form-carrying member, a printing member and an impression member, means for feeding the sheet to different points of the said
65 printing mechanism, means for changing the direction of rotation of the said mechanism, means for maintaining the direction of travel of the said feeding means, means carried by the said impression member for receiving the
70 sheet either from the said printing member or from the said feeding means and means for applying water to the said form-carrying member on the one or the other side of the same according to the direction of rotation
75 of the said printing mechanism.

9. In a printing-machine the combination with a printing mechanism comprising a form-carrying member, a printing member and an impression member, means for feeding the sheet to either the said printing member or the said impression member, means for changing the direction of rotation of the said printing mechanism, means for maintaining the direction of travel of the said
85 feeding means, means carried by the said impression member for receiving the sheet either from the said printing member or from the said feeding means according to the direction of rotation of the said printing
90 mechanism and means for applying water to the said form-carrying member on the one or the other side of the same according to the direction of the rotation of the same.

Signed at New York this 17th day of April, 1906.

THOMAS C. SHEEHAN.

Witnesses:

HELEN LEIGHTON,
GEO. A. HOFFMAN.