

No. 770,486.

PATENTED SEPT. 20, 1904.

J. WHITE.
PRINTING MACHINE.

APPLICATION FILED FEB. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

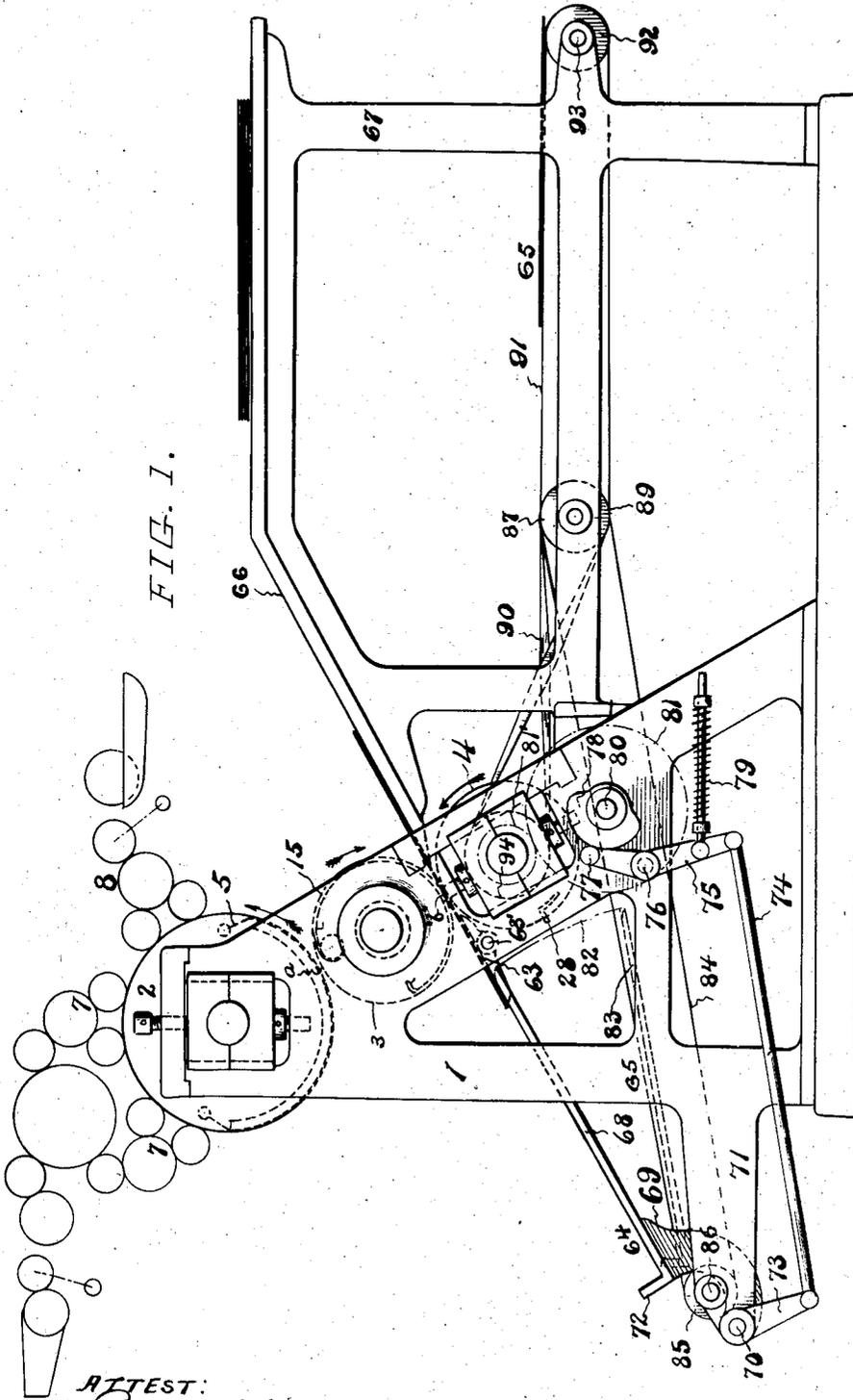


FIG. 1.

ATTEST:
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Wm. S. Williams

INVENTOR
Joseph White

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2 SHEETS—SHEET 2.

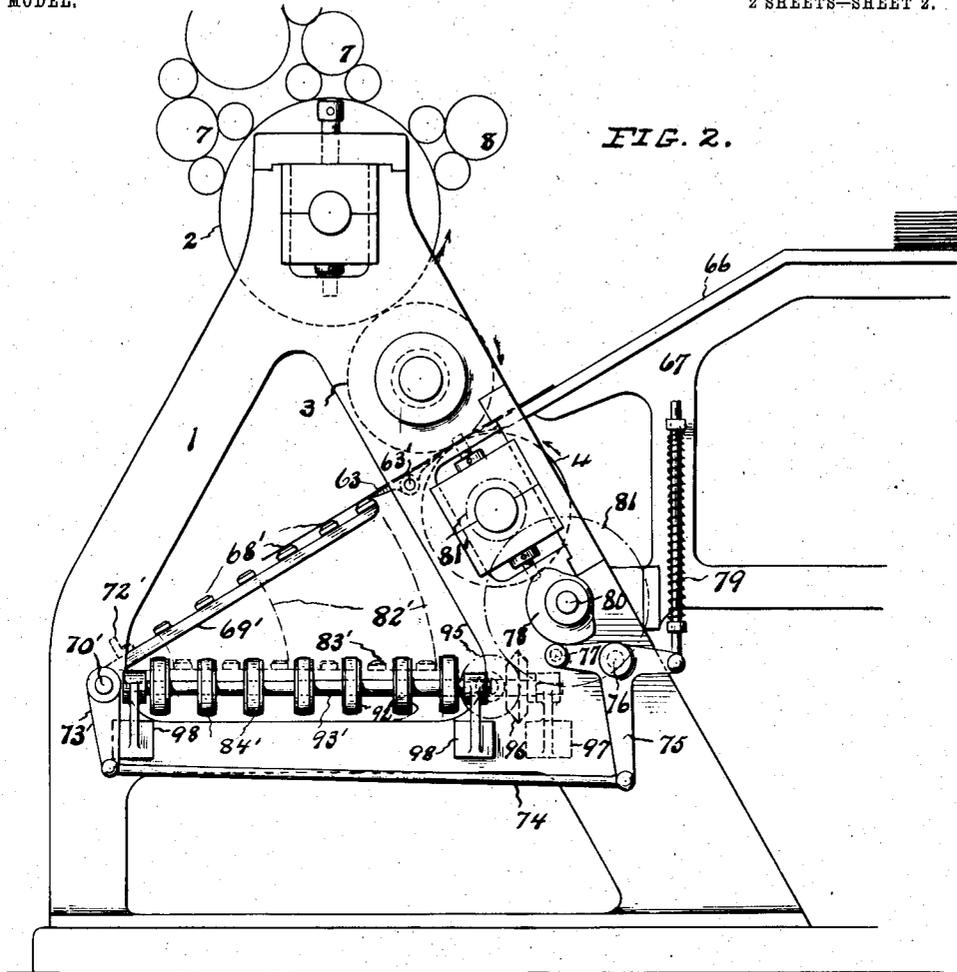


FIG. 2.

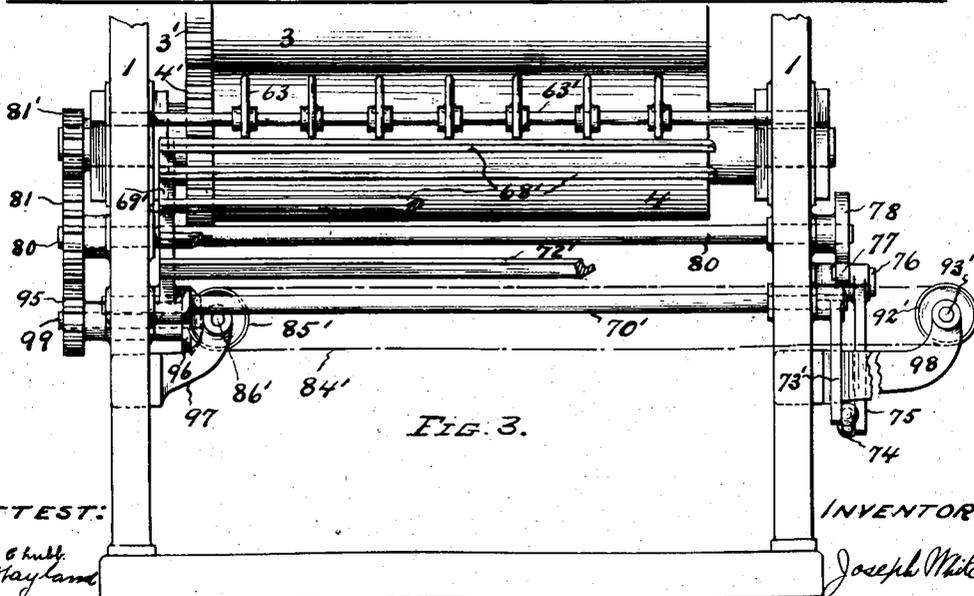


FIG. 3.

ATTEST:

*G. W. G. Hubb.
J. Mayland*

INVENTOR

Joseph White

UNITED STATES PATENT OFFICE.

JOSEPH WHITE, OF NEW YORK, N. Y.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 770,486, dated September 20, 1904.

Application filed February 11, 1903. Serial No. 142,972. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WHITE, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to construct a printing-machine in which the printing members and the delivery mechanism are so arranged that the parts of the machine are easily accessible and in which the delivery of the sheets is simple and efficient, and also a machine in which the product can be under the observation of the operator from a position in front of the machine, from which position the operator can also watch and manipulate the printing members without being interfered with by the delivery or in turn interfering with the removal of the product.

In the accompanying drawings, Figure 1 is a side elevation of a machine which illustrates the features of my invention, such parts being shown as are necessary to an understanding of the invention. Fig. 2 is a side elevation of a similar machine where the delivery is to the side instead of the rear of the machine. Fig. 3 is a front elevation of Fig. 2.

The type of machine illustrated is one in which the product receives the design indirectly from the form through the agency of a transfer-surface. Such a machine is usually employed for printing on metal or other hard unyielding material; but I do not limit myself to this type of machine, for other styles fall within the scope of the invention.

Referring to the drawings, 1 represents the side frames of the machine, in which are mounted the printing members of the machine. These are the form-cylinder 2, the transfer-cylinder 3, and the impression-cylinder 4. A detailed description of the operation of these cylinders is given in my application, Serial No. 142,973, filed at even date herewith, so it will here be briefly stated that the aluminium plate 5, which constitutes the form-surface of this machine, which is stretched on the cylinder 1, is first dampened by the water-rollers at 8, then inked by the ink-rollers at 7, and

then in the continued movement of the cylinder imparts its design at *a* to the rubber blanket which is stretched on the cylinder 3 and which forms the transfer-surface. This design in turn is at *b* imparted to the sheet 4, which is shown as passing between the ink-applying cylinder (in this case the transfer-cylinder 3) and the impression-cylinder 4.

The feeding mechanism, which may be of any suitable or usual character, does not form part of this invention; but the feed-board or sheet-support from which the sheet is fed between the cylinders is shown at 66 mounted on the standards 67, and at 28 is shown a stop against which the sheet is fed.

The means for driving the cylinders of this machine are of the usual type and are omitted from the drawings for the purpose of simplifying it. These means consist of belt-driven pulleys and a compound gear-train meshing with a gear 4', fastened to the impression-cylinder 4, this gear being of equal pitch diameter with its cylinder and meshing with and driving a gear 3' of equal pitch diameter with the transfer-cylinder to which it is fastened, and this gear in turn meshes with and drives a gear of equal pitch diameter with the form-cylinder to which it is fastened.

The delivery mechanism of the machine shown may be varied in form and construction from those shown in Figs. 1 and 2 and fall within the scope of the invention; but the particular means shown are the preferred forms, and their operation and construction are as follows: Referring to Fig. 1, the sheet receives its design from the upper cylinder of the couple and passes out between the cylinders over the guides 63 (which are supported on the rod 63) and to the receiving-frame 64, which, moving in the arc indicated by dotted line 82 to the position shown by dotted line 83, deposits the sheet on the carrier 65, which carries the sheet under the impression-cylinder 4 and to the rear of the machine under the feed-board, where it can be removed and piled either manually or mechanically in any desired manner. In the form of machine shown in Fig. 2 the method of sheet-delivery is similar. Here the sheet also passes over guides 63, which are supported on the rod 63', and to a

receiving-frame consisting of a bracket 69', fastened to a rod 70', said bracket having a series of sticks 68', which in this case are parallel to the cylinders and which move in the arc indicated by dotted lines 82' to a position shown by dotted lines 83', depositing the sheet on a carrier consisting in this case of a bed of tapes 84', which instead of carrying the sheet to the rear of the cylinder, as in Fig. 1, cause the sheet to be delivered to the side of the press, as shown, where it can be removed without interfering with the pressman.

The ink-applying cylinder 3 and the impression-cylinder 4 are preferably arranged at an angle to the perpendicular, so that a sheet may be fed between them onto the receiving-frame 64, which is preferably in line with the feed-board at an angle to the horizontal. It will be seen that by this arrangement of cylinders and delivery the ink-applying cylinders, in this case the form-cylinder 2 and transfer-cylinder 3, are unobstructed and readily accessible from the front of the machine and from this position can be readily manipulated during the operation of the machine; that the printed sheets are in view as they pass to the receiving-frame and carrier and can be watched by the operator from his position in front of the machine; that the sheets are received by the receiving-frame and given to the carrier printed side up, so that nothing comes in contact with the freshly-printed side of the sheets during their delivery, and the sheets are thus delivered without the necessity of bending them around cylinders, as is usual, or of overturning the sheets, and that the delivery-point is in a position where the sheets can be received and handled without interfering with the machine operator or he in turn interfering with the removal of the sheets.

The receiving-frame 64 is preferably employed to place the sheet on the carrier 65; but it is not in all cases a necessary feature, for the guides 63 might be longer and the sheet be allowed to run out on them and on the carrier without any intermediate conveyer, or the guides might be dispensed with; but the receiving-frame and guides will be preferably employed. The receiving-frame may be of any suitable construction; but, as shown, it is the usual type of "fly-frame," consisting of a row of sticks 68, which are fastened to the brackets 69, which in turn are fastened to the rock-shaft 70, which finds its bearing in the standard 71 of the frame. This receiving-frame is also provided with stops 72, formed on the end of the sticks 68. These stops serve to arrest the forward movement of the printed sheet and are preferably placed as shown; but they might otherwise be placed—as, for instance, they might be projected from the standard 71. The manner in which the plane of the receiving-frame is altered so as to place the sheet upon the

carrier may be accomplished in many ways; but as the methods shown are simple and efficient they are preferred. Referring to Figs. 1 and 2, the rock-shaft 70, to which it is pivoted, has fast on its end a lever 73, to the end of which is jointed the connection 74, which is moved by the lever 75, one end of which is jointed to the other end of the connection 74. This lever 75 is pivoted at 76 and has on its upper end a bowl 77, which runs on the face of the cam 78, which cam through the agency of the aforementioned parts controls the movement of the receiving-frame 64 on its pivoted shaft 70. The spring 79 serves to hold the bowl 77 steadily against the cam 78. The cam 78 is mounted on the shaft 80, which finds its bearing on the frame of the machine. On the other end of this shaft and inside the frame is the gear 81, which receives its motion from the pinion 81', which is fast to the impression-cylinder 4. As this cylinder makes three revolutions to each impression, the ratio of the gears 81 and 81' is three to one. This will cause the cam to make one turn to each sheet delivered, and so the receiving-frame makes one oscillation to receive and deposit each sheet. In order that the printed sheet may be under the eye of the operator as long as possible, the high part of cam 78 is so timed and of such a length as to allow the frame to dwell in its upward position after it receives the sheet and before it moves to deliver the sheet to the carrier.

The construction of the carrier may be of any suitable or usual form and will be varied to suit different conditions, and its method of operation may be and will be varied to suit the particular carrier that may be used. In the machine shown in Fig. 1 the carrier consists of two sets of continuously-moving endless tapes which pass around the roller 87, one set, 84, passing toward the front of the machine and around a set of pulleys 85, which rotate with the shaft 86, to which they are fastened, and the other set, 91, toward the rear of the machine and around the pulley 92, which rotates with the shaft 93. The roller 87, which imparts motion to the tapes, receives its motion from the pulley 89 of equal diameter to said roller, said pulley being fast to its shaft. This pulley in turn receives its motion from the crossed belt 90, which is driven by the pulley 94, fast on the end of the shaft of the cylinder 4. When the frame 64 after receiving the printed sheet moves to the dotted position 83, the sticks of which it is composed pass between the tapes 84 of the carrier, and so place the sheet upon these tapes, whose movement causes the sheet to pass along toward the rear of the machine and onto the tapes 91, which continue the movement over the roller 92, where the sheet is taken off in any desired manner.

In Fig. 2, in which form the delivery is to the side of the machine instead of to the rear,

as in Fig. 1, the carrier consists of a set of continuously-moving endless tapes which pass around the pulleys 85' and 92'. The manner of driving this carrier is as follows: Meshing with the gear 81 is the pinion 95, which is fastened on one end of the short shaft 99, on the other end of which and inside of the frame 1 is the miter-gear 96, which in turn meshes with its mate, which is fast on the pulley-shaft 86'. This shaft is supported by a pair of brackets 97, fastened to the inside of the frame, and supports the pulleys 85', giving them their motion. The other end of the carrier consists of a set of pulleys 92', fast to the shaft 93', which shaft is supported by a pair of brackets 98, mounted on side frames 1. When the receiving-frame 64 receives the printed sheet from between the cylinders in the position shown, it moves to the dotted position 83', placing its sticks between the tapes of the carrier and slightly below them. This, it will be seen, causes the sheet to be placed on the bed of tapes, the side motion of which carries the sheet away from in front of the printing-cylinders to the side of the machine, where it can readily be handled without interfering in any way with the operator.

I have shown two methods of disposing of the sheet after being printed upon by the printing-cylinders in which the primary object in view is to so dispose of the product that it can be under the eye of the operator who is stationed in front of the machine where he can manipulate the inking and plate cylinders when necessary, and at the same time the removal of the sheets is effected without interfering in any way with him. It is to be understood, however, that other forms of construction in which the same result can be accomplished are possible, and I therefore do not limit myself to the constructions shown.

While the carrier is illustrated in this position and the sheets are moved to the rear of the machine in the manner described, it is to be understood that the primary object of this arrangement is to so dispose of the product that it can be under the eye of the operator who is stationed in front of the machine and at the same time be readily removed without interfering with the operator. If the carrier were arranged so as to deliver the sheet to the right or left of the machine, which could readily be done instead of the rear, as shown, the same result would be accomplished. Such an arrangement, therefore, falls within the scope of the invention, and the use of such an arrangement is contemplated.

What I claim is—

1. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, and means for receiving the sheet from between said cylinders and removing said sheet from before the cylinders; said means giving the sheet a motion in a different direction to that imparted to it when under

the control of said cylinders, the sheet remaining the same side up throughout the operation, substantially as described.

2. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, and means for receiving the sheet from between the cylinders and for giving said sheet a movement in a reverse direction to that imparted to it by the printing-cylinders to remove it from before said cylinders, said sheet remaining same side up throughout the operation, substantially as described.

3. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, and means for receiving the sheet from between the cylinders and for giving said sheet a movement in a reverse direction to that imparted to it by the printing-cylinders and for returning said sheet to the feeding side of the couple, said sheet remaining same side up throughout the operation, substantially as described.

4. In a printing-machine having a form, a transfer and an impression member, means for receiving the sheet from between the transfer and impression member, and for giving said sheet a movement in a different direction from that imparted to it by the printing members to remove it from in front of said members, said sheet remaining same side up throughout the operation, substantially as described.

5. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders, means for stopping said sheet, and means for giving said sheet a movement in a different direction from that imparted by the printing-cylinders to remove it from in front of said cylinders, said sheet remaining same side up throughout the operation, substantially as described.

6. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders, means for stopping said sheet, and means for giving said sheet a movement in a reverse direction from that imparted by the printing-cylinders, said sheet remaining same side up throughout the operation, substantially as described.

7. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving a sheet from between the cylinders, means for stopping said sheet, and means for giving it a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to the feeding side of the couple, said sheet remaining same side up throughout the operation, substantially as described.

8. The combination of a printing-couple having a design-applying cylinder and an im-

pression-cylinder, a sheet-support from which the sheet is fed, means for receiving a sheet from between the cylinders, means for stopping said sheet, and means for giving it a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to a position below the sheet-support, said sheet remaining same side up throughout the operation, substantially as described.

9. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders and for changing the plane of said sheet, and means for giving said sheet a movement in a different direction from that imparted to it by the printing-cylinders to remove it from in front of said cylinders, said sheet remaining same side up throughout the operation, substantially as described.

10. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders and for changing the plane of said sheet, and means for giving said sheet a movement in a reverse direction from that imparted to it by the printing-cylinders, said sheet remaining same side up throughout the operation, substantially as described.

11. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders and for changing the plane of said sheet and means for giving it a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to the feeding side of the couple, said sheet remaining same side up throughout the operation, substantially as described.

12. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a sheet-support from which the sheet is fed, means for receiving the sheet from between the cylinders and for changing the plane of said sheet, and means for giving it a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to a position below the sheet-support, said sheet remaining same side up throughout the operation, substantially as described.

13. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders, for stopping the sheet and for changing the plane of said sheet, and means for giving said sheet a movement in a different direction from that imparted to it by the printing-couple, said sheet remaining same side up throughout the operation, substantially as described.

14. The combination of a printing-couple

having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders, for stopping the sheet and for changing the plane of said sheet, and means for giving said sheet a movement in a reverse direction from that imparted to it by the printing-couple, said sheet remaining same side up throughout the operation, substantially as described.

15. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, means for receiving the sheet from between the cylinders, for stopping the sheet, and for changing the plane of said sheet, and means for giving said sheet a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to the feeding side of the couple, said sheet remaining same side up through the operation, substantially as described.

16. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a sheet-support from which the sheet is fed, means for receiving the sheet from between the cylinders, for stopping the sheet and for changing the plane of said sheet, and means for giving said sheet a movement in a reverse direction from that imparted to it by the printing-cylinders and for returning said sheet to a position below the sheet-support, said sheet remaining same side up throughout the operation, substantially as described.

17. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a frame upon which the sheet is placed by the motion given said sheet by these cylinders, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and giving the sheet a movement in a different direction from that imparted to it by the printing-cylinders, said sheet remaining same side up throughout the operation, substantially as described.

18. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a frame upon which the sheet is placed by the motion given said sheet by the cylinders, a stop attached to said frame, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and for giving the sheet a movement in a different direction from that imparted to it by the printing-couple, said sheet remaining same side up throughout the operation, substantially as described.

19. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a frame upon which the sheet is placed by the motion given said sheet by these cylinders, a stop attached to said frame, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and for giving the sheet a movement in a different direction from that

imparted to it by the printing-couple and for returning the sheet under the impression-cylinder, the same side of the sheet remaining up throughout the operation, substantially as described.

20. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by the cylinders, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and for giving the sheet a movement in a different direction from that imparted to it by the printing-cylinders, said sheet remaining same side up throughout the operation, substantially as described.

21. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by these cylinders, a stop attached to said frame, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and for giving the sheet a movement in a direction different from that imparted to it by the printing-cylinders, said sheet remaining same side up throughout the operation, substantially as described.

22. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by these cylinders, a stop attached to said frame, means for changing the plane of said frame, and a carrier for receiving the sheet from the frame and for giving the sheet a movement in a different direction from that imparted to it by the printing-couple and for returning the sheet under the impression-cylinder with the same side up, substantially as described.

23. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by the cylinders, a stop on said frame, a shaft on which the frame is pivoted, a carrier to receive the sheet from the frame, and a cam for actuating said frame so as to receive the sheet from between the cylinders, change its plane, and give the sheet to the carrier, said sheet remaining same side up

throughout the operation, substantially as described.

24. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by the cylinders, a stop on said frame, a shaft on which the frame is pivoted, a carrier to receive the sheet from the frame, and a cam for actuating said frame so as to receive the sheet from between the cylinders, change its plane, and give the sheet to the carrier, said carrier reversing the direction of the sheet and returning it under the impression-cylinder, said sheet remaining same side up throughout the operation, substantially as described.

25. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by the cylinders, a stop on said frame, a shaft on which the frame is pivoted, a carrier to receive the sheet from the frame, and a cam for actuating said frame so as to receive the sheet from between the cylinders, allow it to dwell in this position, then change its plane and give the sheet to the carrier, said sheet remaining same side up throughout the operation, substantially as described.

26. The combination of a printing-couple having a design-applying cylinder and an impression-cylinder, a pivoted frame upon which the sheet is placed by the motion given said sheet by these cylinders, a stop on said frame, a shaft on which the frame is pivoted, a carrier to receive the sheet from the frame, and a cam for actuating said frame so as to receive the sheet from between the cylinders, allow it to dwell in this position, then change its plane and give the sheet to the carrier, said carrier reversing the direction of the sheet and returning it under the impression-cylinder, said sheet remaining same side up throughout the operation.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH WHITE.

Witnesses:

PERCIVAL METCALF,
HIRAM S. WILLIAMS.