

No. 689,527.

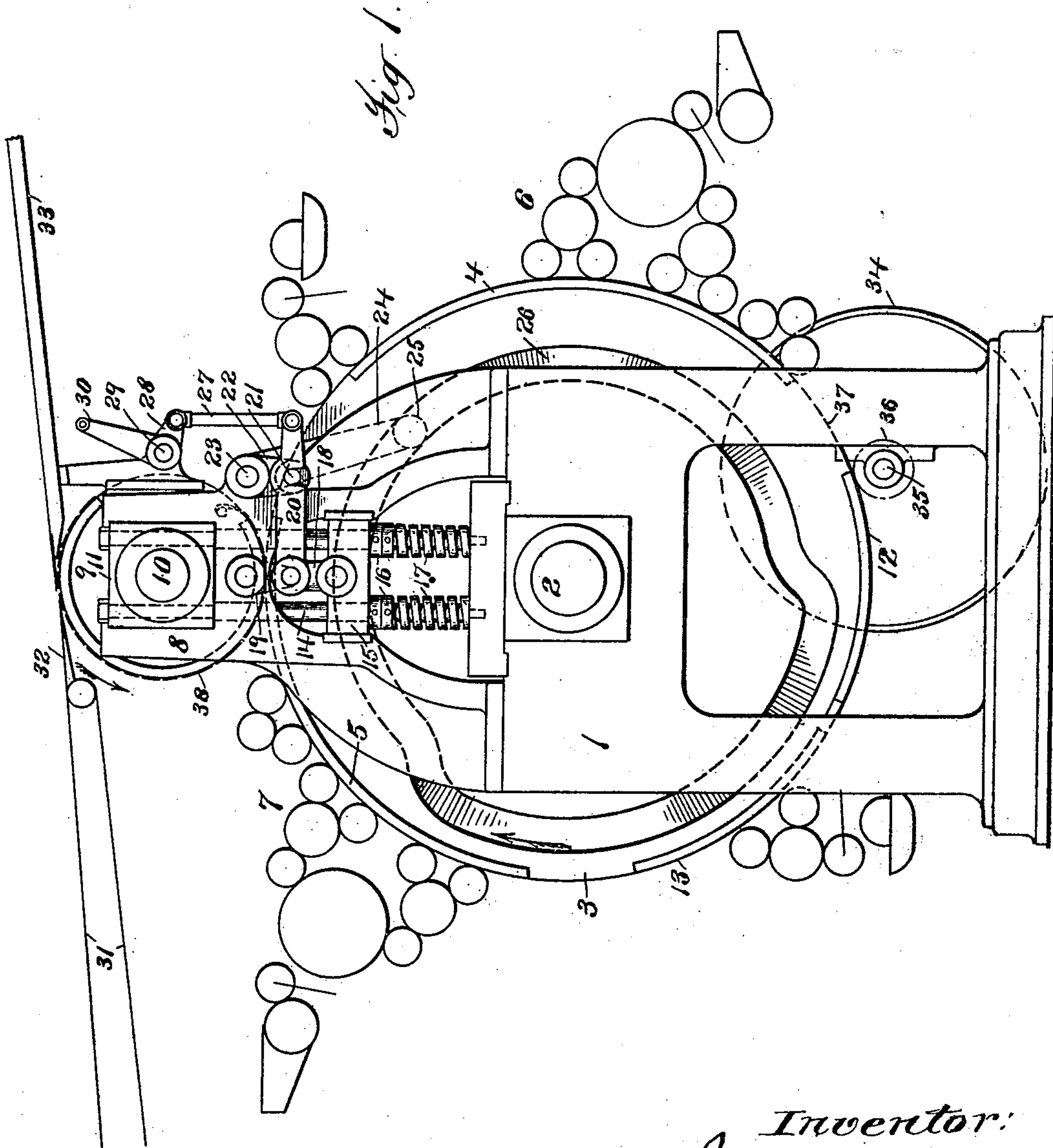
Patented Dec. 24, 1901.

J. WHITE.
MULTICOLOR PRINTING MACHINE.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Attest:
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H. A. Rafier

Inventor:
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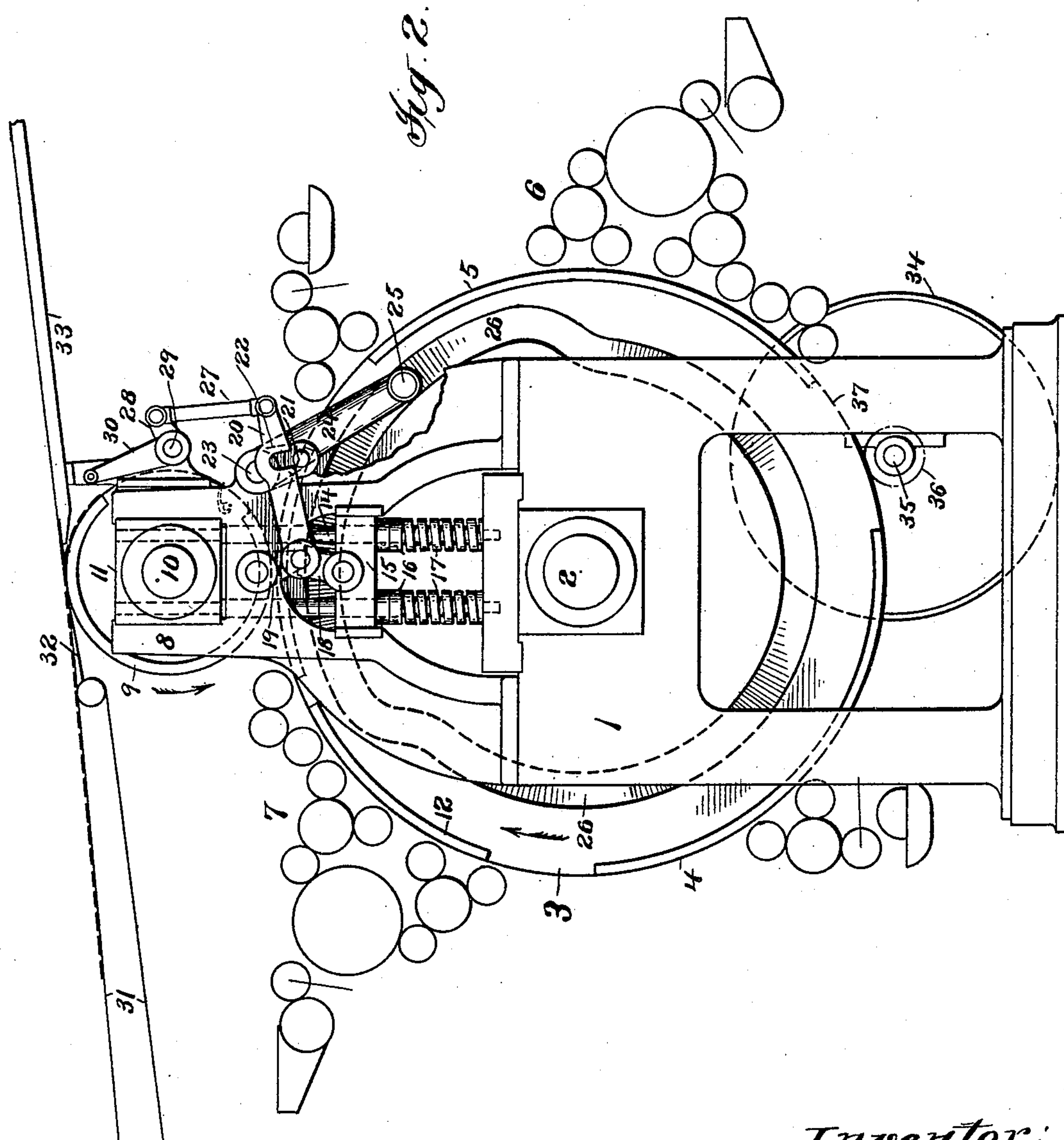
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MULTICOLOR PRINTING MACHINE.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

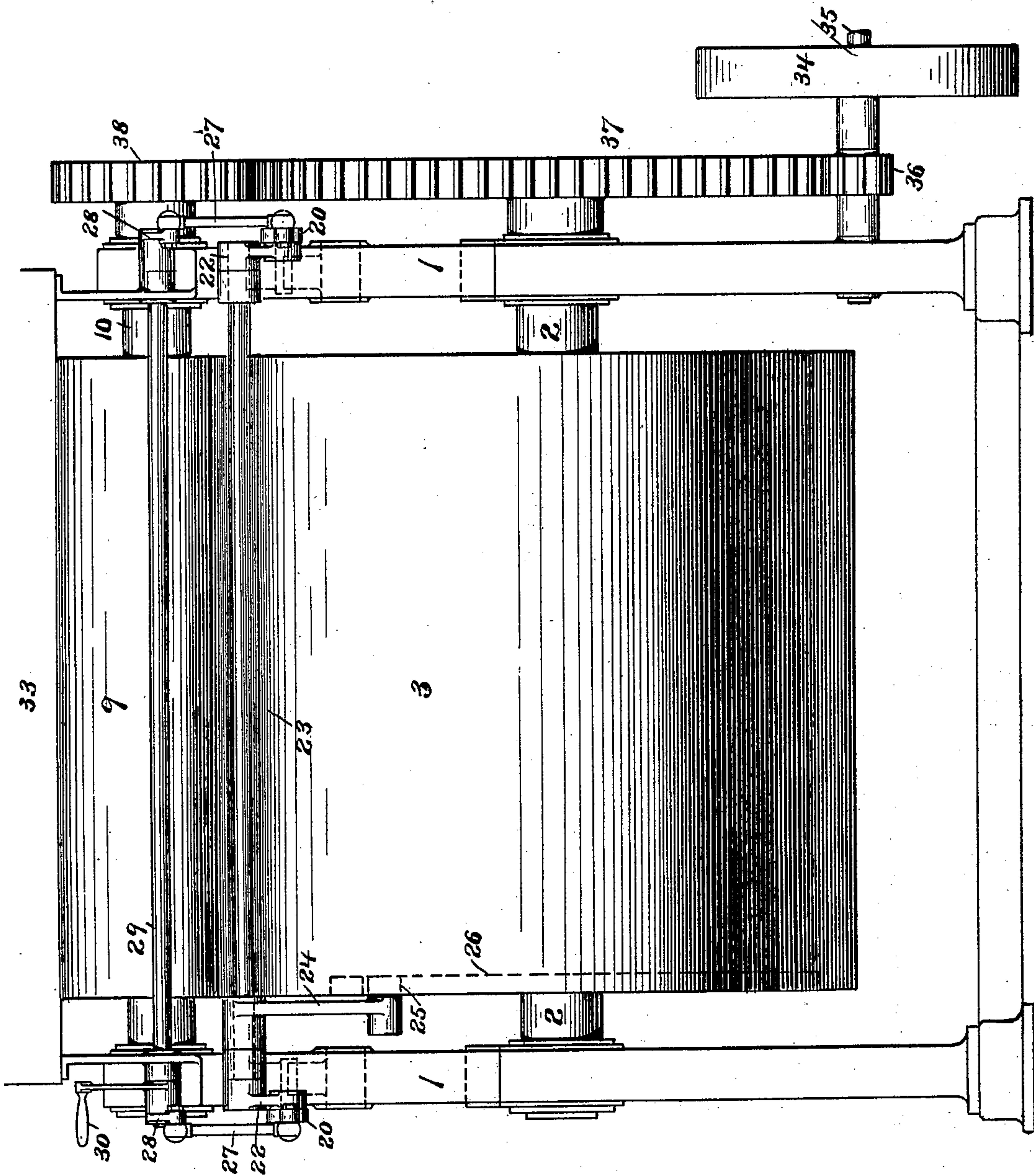


Fig. 3.

Attest:
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UNITED STATES PATENT OFFICE.

JOSEPH WHITE, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF
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MULTICOLOR-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 689,527, dated December 24, 1901.

Application filed April 12, 1901. Serial No. 55,579. (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 of New York, and State of New York, have invented certain new and useful Improvements in Multicolor-Printing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to certain improvements in multicolor-printing machines.

It has been proposed to construct multicolor-printing machines by providing the form-carrier with a plurality or set of form-surfaces, the impression member having a single surface which coöperates in turn with the form-carrying surfaces, the circumference of the form-carrier being made of sufficient length so that the impression member may make an idle revolution to deliver between the time it runs out of contact with the last form-surface of the set and the time when it runs in contact with the first form-surface of the set. The inking mechanisms intended for use with this proposed construction consisted of the usual form-rollers, which were supplied with ink by ductors for fountains of the ordinary description, said rollers being intended to break up the ink and then apply it to the forms. In the better classes of multicolor-printing, however, very thorough breaking up and distribution of the ink is necessary in order to produce the finer classes of work, and it has been found from practical experience that a set of rollers such as referred to do not effect such a distribution of the ink as is necessary for fine printing and that far better results are secured where the rollers which apply the ink to the form are caused before they meet the form to run in contact with an ink-distributing surface or table—such, for instance, as is ordinarily employed in a bed-and-cylinder machine. Furthermore, it has been particularly desirable in multicolor-machines to deliver the sheet with its last-printed side up, a result which is not accomplished by the proposed construction referred to, in which the sheets were delivered by means of a fly.

50 It is the object of this invention to produce

a printing-machine in which a rotating form-carrier having a plurality of form-surfaces is employed and an impression member which coöperates with said form-surfaces and in which a thorough distribution of the ink is obtained.

A further object of the invention is to produce a printing-machine employing a form-carrier having a plurality of form-surfaces and an impression member which coöperates with said form-surfaces in which a thorough distribution of the ink is attained and in which the printed sheet is delivered with its last or freshly printed side up.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a side elevation of a printing-machine constructed in accordance with the invention. Fig. 2 is a view similar to Fig. 1, but showing the parts in a different position. Fig. 3 is an end view.

Referring to the drawings, 1 indicates the frame of the machine, which may be of any desired construction or configuration. Mounted in the frame is a shaft 2, said shaft serving to support a rotating form-carrier 3, said form-carrier in the present construction being a cylinder. The form-carrier is provided with a plurality of form-surfaces, and any number of such surfaces may be employed.

In the present instance two such surfaces, which are marked 4 and 5, respectively, are employed. Suitable ink-applying mechanisms are provided for each surface, the ink-applying mechanism for the surface 4 consisting of sets of rolls marked 6 and the ink-applying mechanism for the surface 5 consisting of sets of rolls marked 7. The ink is supplied to the rolls from fountains by means of ductors in the ordinary manner. The frame is provided with uprights 8, in which the impression member, which coöperates with the printing-surfaces, is mounted.

In the present construction this impression member consists of a cylinder 9, mounted on a shaft 10. In the preferred form of the present invention the impression-cylinder will be
 5 lifted by a tripping mechanism, to be hereinafter described, and to this end the shaft 10, which supports said cylinder, is mounted in sliding boxes of ordinary construction.

In order to attain that thorough distribution of ink which is desirable, particularly in multicolor-printing, an ink-distributing surface is provided, over which the ink-applying rolls run before they come in contact with the forms. In the preferred construction
 10 each set of applying rolls will cooperate with such distributing-surface, and in order to effect this in the most advantageous manner the surfaces should be located on the form-carrier. In the construction shown the circumference of the form-carrying cylinder must be sufficiently long to permit the form-carrier to make an idle revolution in which to deliver its printed sheet, and this revolution must occur between the time when the
 15 impression-surface runs out of contact with the last form of the set and before it runs into contact with the first form of the set. While the inking-surfaces may be variously located in the machine, in the preferred construction they will be located on that part of the form-carrier which is running under the impression-cylinder at the time when the same is delivering its sheet. It has been
 20 heretofore stated that in the preferred construction there will be one ink-distributing surface for each set of ink-applying rollers, and in the present construction therefore, since there are two forms, two ink-distributing surfaces 12 and 13 are employed, the surface 12 cooperating with the applying-rollers
 25 6 and the surface 13 cooperating with the applying-rollers 7, and these surfaces will be located in the space between the head of the form-carrying surface 4 and the tail of the form-carrying surface 5. Suitable means are provided for controlling the applying-rollers so that they will touch only the distributing-surface with which they are intended to cooperate; but since these means are common
 30 and well known in the art they have been omitted from the drawings in the interest of clearness.

In constructions such as that shown, which, as before said, is a preferred form of the invention, since the impression-surface on the impression member or cylinder covers substantially the entire surface of the cylinder, it is necessary to move the impression member away from the form-carrier at a time
 35 when the ink-tables are passing beneath it, at which time said impression-cylinder is making its delivering revolution, in order to prevent the surface of said cylinder from touching the ink-distributing surface. A suitable tripping mechanism is accordingly provided, which may be operated to trip the cyl-

inder on each revolution of the form-carrier. Since, furthermore, it is desirable in the process of inking up or when a sheet is missed in feeding to keep the cylinder in its raised position, this tripping mechanism will preferably be constructed so that the impression member may be held tripped one or a number of revolutions of the form-carrier. The particular construction of the tripping mechanism may be varied within wide limits. As shown, however, there is provided a pair of lifting-rods 14 for each cylinder-box 11, said rods passing through the boxes and being provided with suitable shoulders on which the boxes rest. Each pair of rods carries a block 15, which rests on collars 16, suitably secured to the rods, and suitable springs 17 surround the rods, said rods resting at one end against the collars 16 and at the other end against the cap of the box which supports the form-carrying shaft, said cap also serving to support the rods. Each block 15 has pivoted thereto one member 18 of a pair of toggle-levers, the other member 19 of each pair being pivoted to a cross-web of the uprights 8. It is apparent that as the toggles are made and broken the cylinder-boxes 11 and the cylinder 9 will be raised and lowered. Any suitable construction may be employed for making and breaking the toggles. As shown, each toggle has connected thereto a gab-hook 20, said hook taking over a pin 21, mounted on an arm 22. The arms 22 extend from a rock-shaft 23, suitably journaled in the frame of the machine. The shaft 23 has mounted on it on one side thereof a cam-lever 24, provided with a bowl or roller 25, which engages a cam 26, preferably carried on form-carrier 3. This cam 26 is so formed as to make and break the toggles once for each revolution of the form-carrier, so that during each revolution the springs 17 act to lift the impression member, and the toggles act to bring it back into impression position, the cam being so timed as to break the toggles at the time just before the ink-distributing surfaces pass under the impression-cylinder.

In order to hold the cylinder raised during the inking-up process or in case a sheet is missed in feeding, suitable means are provided for disconnecting the connections between cam 26 and the toggles. While these means may be of any suitable description, they are preferably hand-operated. As shown, each gab-hook 20 is connected by a link 27 to an arm 28, said arms being mounted on a rock-shaft 29, which extends across the machine from side to side. This rock-shaft is provided with a handle 30, which extends up into a position where it can be easily grasped by the feeder.

The delivery mechanism employed may be of any suitable description, but preferably is arranged to deliver the sheets with the last-printed side up. For this purpose an ordinary front-delivery mechanism will be em-

ployed, said mechanism being indicated by tapes 31 and switch-fingers 32. This type of delivery mechanism is well known in the art, and a fuller description and illustration of it is therefore unnecessary. The sheets may be supplied to the impression-cylinder 9 in any suitable manner. Preferably, however, the machine will be provided with a feed-board 33 of the ordinary type.

The machine may be driven in any suitable manner. As shown, a belt-pulley 34 is provided mounted on a shaft 35, one end of which is suitably supported in the machine. This shaft carries a pinion 36, which meshes with a large gear 37, which is mounted on the shaft 2 of the form-carrier 3. Meshing with the gear 37 is another similar gear 38, which is mounted on the shaft 10 of the impression-cylinder.

While the mechanism which has been described is an effective one for carrying out the invention, it is to be understood that many changes and modifications may be made therein without departing from the invention. The invention is not, therefore, to be limited to the specific details of construction hereinbefore described.

What is claimed is—

1. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and a plurality of ink-distributing surfaces, one for each form-carrying surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.

2. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, and a tripping mechanism operating to lift the impression member on each revolution of the form-carrier, whereby the impression member is enabled to clear the ink-distributing surface, substantially as described.

3. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism operating to lift the impression member on each revolution of the form-carrier, whereby the impression member is enabled to clear the ink-distributing surface, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its

last-printed side up, substantially as described.

4. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, means for operating the tripping mechanism on each revolution of the form-carrier, and means for disconnecting the tripping mechanism from its operating means so as to permit the impression member to remain tripped during a number of revolutions of the form-carrier, substantially as described.

5. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, means for operating the tripping mechanism on each revolution of the form-carrier, means for disconnecting the tripping mechanism from its operating means so as to permit the impression member to remain tripped during a number of revolutions of the form-carrier, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.

6. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, means for operating the tripping mechanism on each revolution of the form-carrier, and hand-operated means for disconnecting the tripping mechanism from its operating means so as to permit the impression member to remain tripped during a number of revolutions of the form-carrier, substantially as described.

7. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, means for operating the tripping mechanism on each revolution of the form-carrier, hand-operated means for disconnecting the tripping mechanism from its operating means so as to permit the impression member to remain tripped during a number of revolutions of the form-carrier, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.

8. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, a cam rotating with the form-carrier, and means controlled by the cam for causing the operation of the tripping mechanism on each revolution of the form-carrier, substantially as described.
9. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, a cam rotating with the form-carrier, means controlled by the cam for causing the operation of the tripping mechanism on each revolution of the form-carrier, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.
10. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, a cam rotating with the form-carrier, connections between the cam and the tripping mechanism whereby the impression member may be caused to be tripped on each revolution of the form-carrier, and means for interrupting said connections whereby the cylinder may be permitted to remain tripped for a number of revolutions of the form-carrier, substantially as described.
11. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, a cam rotating with the form-carrier, connections between the cam and the tripping mechanism whereby the impression member may be caused to be tripped on each revolution of the form-carrier, means for interrupting said connections whereby the cylinder may be permitted to remain tripped for a number of revolutions of the form-carrier, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.
12. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism comprising suitable lifting means, a cam, connections controlled by the cam for throwing the lifting means into operation and for bringing the impression member back to impression position, and means for interrupting said connections, substantially as described.
13. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and an ink-distributing surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism comprising suitable lifting means, a cam, connections controlled by the cam for throwing the lifting means into operation and for bringing the impression member back to impression position, means for interrupting said connections, means for presenting a sheet to the impression member, and a delivery mechanism operating to take the sheet from said impression member with its last-printed side up, substantially as described.
14. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and a plurality of ink-distributing surfaces, one for each form-carrying surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism which operates to lift the impression member on each revolution of the form-carrier, whereby the impression member is enabled to clear the ink-distributing surfaces, substantially as described.
15. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and a plurality of ink-distributing surfaces, one for each form-carrying surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, said mechanism including suitable lifting-springs, a toggle mechanism for restoring the impression member to impression position and holding it there, a cam rotating with the form-carrier, a lever operated by said cam, connections between said lever and the toggle mechanism, and means for interrupting said connections, substantially as described.
16. In a multicolor-printing machine, the combination with a rotating form-carrier having a plurality of form-carrying surfaces and a plurality of ink-distributing surfaces, one for each form-carrying surface, of a rotating impression member having an impression-surface which coöperates with the forms on the form-carrier, a tripping mechanism, said

mechanism including suitable lifting-springs,
a toggle mechanism for restoring the impres-
sion member to impression position and hold-
ing it there, a cam rotating with the form-
5 carrier, a lever operated by said cam, connec-
tions between said lever and the toggle mech-
anism, means for interrupting said connec-
tions, means for presenting a sheet to the im-
pression member, and a delivery mechanism
10 operating to take the sheet from said impres-

sion member with its last-printed side up,
substantially as described.

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

JOSEPH WHITE.

Witnesses:

F. W. H. CRANE,
L. ROEHM.