

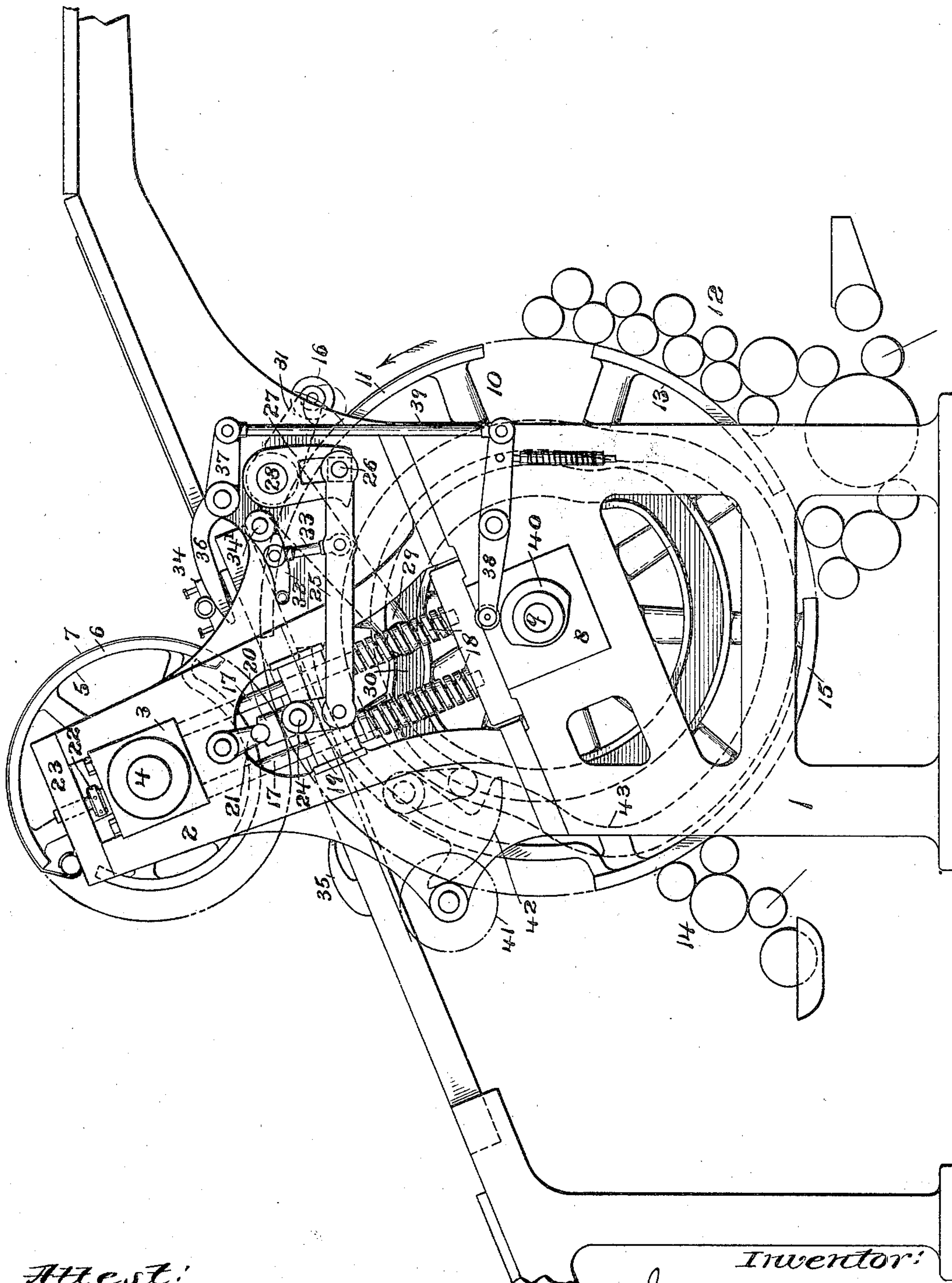
No. 705,180.

Patented July 22, 1902.

J. WHITE.
PRINTING MACHINE.

Application filed Sept. 26, 1901.)

(No Model.)



Attest:
A. White
J. A. Graves.

Inventor:
Joseph White
Philipp. Sawyn. Rice & Kennedy
Atty's

UNITED STATES PATENT OFFICE.

JOSEPH WHITE, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF
NEW YORK, N. Y.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 705,180, dated July 22, 1902.

Application filed September 26, 1901. Serial No. 76,600. (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 Printing-Machines, fully described and represented in the following specification and the accompanying drawing, forming a part of the same.

10 This invention relates to certain improvements in printing-machines, and has for one of its objects to produce a printing-machine which shall employ a printing-couple, one member of which is provided with the printing-surface and the other member of which is provided with an ink-applying surface and an impression-surface.

15 A further object of the invention is to produce a printing-machine in which the couple shall consist of a member carrying a printing-surface and a member carrying an ink-applying surface for said printing-surface and a planographic impression-surface.

20 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.

25 The accompanying drawing illustrates in side elevation so much of a printing-machine as is necessary to an understanding of the invention.

30 The machine which has been chosen to illustrate the invention is a machine of the rotary type, the printing-cylinder of which employs a yielding transfer-surface.

35 Referring to the drawing, 1 indicates the frame of the machine, which may be of any desired construction. When, as in the construction shown, the printing member of the couple is generally cylindrical in form, the frame is or may be provided with standards 2, in which the boxes 3, which support the printing-cylinder shaft 4, are mounted. The printing-cylinder 5 is provided with a segmental bed 6, on which the printing-surface 7 is supported. This printing-surface may be of any desired character. In the machine shown a yielding transfer-surface consisting of a rubber blanket is employed, said sur-

face being strained over and secured in position with respect to the bed in any suitable manner and by any of the agencies commonly employed for this purpose. As shown, the member 10 of the printing-couple, which co-operates with the printing member, is also cylindrical in form, the frame 1 serving to support boxes 8, in which the shaft 9 of this cylinder 10 is mounted. This cylinder is provided with a surface 11, by which the printing medium, such as color or ink, is applied to the transferring-surface 7 of the cylinder 5. This ink-applying surface will preferably deliver the ink to the surface 7 in the form of a design. While this ink-applying surface 11 may be of any suitable or desired material, it will preferably consist of a suitable planographic material—such, for instance, as aluminium. The color or ink may be applied to the surface 11 in any suitable manner and by any of the agencies ordinarily employed for this purpose. As shown, an inking mechanism 12 is employed for this purpose, this mechanism consisting of the usual fountain and rollers, and, as shown, the cylinder is provided with a table 13, which coöperates with the roller in breaking up and mixing the ink. When the ink-applying surface is of planographic material, suitable dampening mechanism (indicated at 14) will be employed. The cylinder 10 is further provided with an impression-surface, which may be of any suitable material. In the construction shown this surface, which is marked 15, will preferably consist of a material which when dampened will repel ink—such, for instance, as aluminium. By forming the impression-surface from such material it is unnecessary to move the rolls which apply the ink to the ink-applying surface toward and away from the cylinder in order to keep them out of contact with the impression-surface; but should it be desired to give the inking-rolls a movement any of the usual mechanisms may be employed for this purpose. When the impression-surface is of planographic material, the dampening mechanism 14 will be arranged to apply moisture to it before it runs under the inking-rollers, so that ink will not be deposited thereon. A suitable wiping mechanism will also prefer-

ably be employed when the impression-surface is planographic in character. This wiping mechanism, as shown, consists of a roll 16, which may be mounted or operated in any suitable or desired manner. The particular manner of mounting this roll will be hereinafter described.

When the members of the printing-couple consist of cylinders, the printing-cylinder will be arranged to make two revolutions to each revolution of the cooperating cylinder, the ink or design being applied to the printing-surface of the printing-cylinder on one revolution, during which time it runs in contact with the ink-applying surface 11, and the printing being effected on the next revolution of the cylinder, during which time it is in cooperative relation with the impression-surface 15.

The machine which has been chosen to illustrate the invention is more particularly designed for the purpose of printing on material other than paper—such, for instance, as sheets of tin or other metal. When such material is to be printed on in a machine of this character, it is obvious that since the material has a considerable thickness as compared with paper it is necessary to slightly separate the cylinders after the ink or design has been applied to the printing-surface of the printing-cylinder, so that the material to be printed may be passed between the two cylinders. The separation of the cylinders may be effected by any desired means. As shown, the boxes 3, which support the shaft 4 of the cylinder 5, are connected to rods 17, the lower ends of said rods being surrounded by springs 18, which tend to move the rods to separate the cylinders. The rods have securely connected to them blocks 19, each block serving to support one member 20 of a toggle, the other member 21 of each toggle being secured to a standard 2. When the toggles are made, the cylinder 5 is drawn downward against the springs and so positioned that its printing-surface will come in contact with the ink-applying surface 11 on the cylinder 10. When, however, the toggles are broken, the springs will move the rods 17 upward, thus separating the cylinders. Means are preferably provided to control the amount of separation between the cylinders, and these means may be of any suitable description. As shown, they consist of set-screws 22, which are journaled in the ordinary cylinder-caps 23. The toggles may be made and broken in any desired manner. As shown, the short shaft 24, to which the member 20 of each toggle is connected, has connected to it on each side of the machine a bar 25. Each bar 25 carries a stud 26, secured to a grooved arm 27. These arms 27 are connected to a shaft 28, which extends across the machine, said shaft having secured to it an arm 29, which carries a bowl which engages in a path-cam 30, mounted on

the shaft 9 of the cylinder 10. As this cylinder rotates, therefore, the shaft 28 will be rocked and the toggles made and broken at the proper time. The shaft 28 forms a convenient means for supporting the wiping-roller 16. It is accordingly provided with arms 31, in which said roller is journaled. These arms are arranged as shown so that when the toggles are broken the roller 16 is thrown downward and contacts with the impression-surface 15, so as to take up any surplus moisture which may be on it. As soon, however, as the impression and printing surfaces have passed out of cooperative relation the cylinders are brought together by the means described, and the movement of the shaft 28 raises the wiping-roller, so that it will not run in contact with the design or ink-applying surface 11. In the construction illustrated the printing-surface 7 is about to receive its ink from the applying-surface 11, and the toggles are therefore made and the wiping-roller 16 is raised. When, however, the ink-applying surface 11 has passed out of contact with the surface 7, the toggles will be broken and the wiping-roller thrown down.

Means are preferably provided for tripping the cylinder in case a sheet is missed in feeding or for any other reason. In the construction shown this is effected by means of a hand-lever 32, which is connected, by means of a link 33, to the bar 25 on one side of the machine. This hand-lever is mounted on a shaft 34', which extends across the machine and which is connected to the bar 25 on the opposite side of the machine. By forcing the hand-lever 32 downward the studs 26 are disengaged from the grooved arms 27, so that the same may move idly without operating the toggles.

A feeding mechanism is or may be employed for introducing the material to be printed between the cylinders. The particular mechanism herein illustrated comprises a pair of gripper-jaws 34, which reciprocate between the cylinders, the cylinders being cut away, as shown, to permit this movement. Stationary cams 35 and a movable cam 36 are provided to open the grippers at the proper time, the cam 36 being controlled by a system of levers 37 38 and a link 39, the lever 38 being operated by a cam 40 mounted on the shaft 9 of the cylinder 10. The gripper-bars are mounted on a suitable carriage which is provided with racks, (not shown,) said racks being driven by gears, one of which is indicated at 41. These gears are in turn driven by suitable connections having a segment 42, (shown in dotted lines,) which is controlled from a path-cam 43, also indicated in dotted lines. The particular feeding mechanism just described forms the subject-matter of an application filed at even date herewith and serially numbered 76,599. Reference is made to said application for a full descrip-

tion of the construction and operation of this mechanism, and a further description in this application is accordingly unnecessary.

The mechanism by which the cylinders are driven may be of any usual or desired form. Inasmuch as such driving mechanism and the necessary gearing may be supplied by any person skilled in the art, a description or illustration of it is unnecessary.

While the invention is shown as embodied in a rotary printing-machine employing a transfer printing-surface and a planographic ink-applying and impression surfaces, it is to be understood that it is by no means confined to such a machine. The members of the printing-couple need not be cylinders, but may be of any desired form, and the printing, ink-applying, and impression surfaces may be of any desired character. It is to be understood, furthermore, that certain features of the invention may be employed independently of other features and that such independent use is contemplated. The invention is not, therefore, to be limited to the specific mechanism which has been described and shown.

What is claimed is—

1. In a printing-machine, the combination with a printing-couple comprising a member arranged to carry a transfer-surface, and a cooperating member arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, substantially as described.

2. In a printing-machine, the combination with a printing-couple comprising a member arranged to carry a transfer-surface, and a cooperating member arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, and means for controlling the amount of such separation, substantially as described.

3. In a printing-machine, the combination with a printing-couple comprising a cylinder arranged to carry a transfer-surface, and a cooperating member arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, substantially as described.

4. In a printing-machine, the combination with a printing-couple comprising a cylinder arranged to carry a transfer-surface, and a

coöperating member arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, and means for controlling the amount of such separation, substantially as described.

5. In a printing-machine, the combination with a printing-couple comprising a member arranged to carry a transfer-surface, and a cooperating cylinder arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, substantially as described.

6. In a printing-machine, the combination with a printing-couple comprising a member arranged to carry a transfer-surface, and a cooperating cylinder arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, and means for controlling the amount of such separation, substantially as described.

7. In a printing-machine, the combination with a printing-couple comprising a cylinder arranged to carry a transfer-surface, and a cooperating cylinder arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, substantially as described.

8. In a printing-machine, the combination with a printing-couple comprising a cylinder arranged to carry a transfer-surface, and a cooperating cylinder arranged to carry a surface from which the transfer-surface receives its printing medium and an impression-surface, of means for separating the members of the couple after the surface has delivered the printing medium to the transfer-surface and before the transfer and impression surfaces come into coöperative relation, and means for controlling the amount of such separation, substantially as described.

9. A printing-couple comprising a member arranged to carry a printing-surface and a cooperating member carrying an ink-applying means and a planographic impression-surface, substantially as described.

10. A printing-couple comprising a cylinder arranged to carry a printing-surface and a co-

operating member carrying an ink-applying means and a planographic impression-surface, substantially as described.

11. A printing-couple comprising a member
5 arranged to carry a printing-surface and a co-operating cylinder carrying an ink-applying means and a planographic impression-surface, substantially as described.

12. A printing-couple comprising a cylinder
10 arranged to carry a printing-surface and a co-operating cylinder carrying an ink-applying means and a planographic impression-surface, substantially as described.

13. A printing-couple comprising a member
15 arranged to carry a flexible printing-surface and a coöperating member carrying an ink-applying means and a planographic impression-surface, substantially as described.

14. A printing-couple comprising a cylinder
20 arranged to carry a flexible printing-surface and a coöperating member carrying an ink-applying means and a planographic impression-surface, substantially as described.

15. A printing-couple comprising a member
25 arranged to carry a flexible printing-surface and a coöperating cylinder carrying an ink-applying means and a planographic impression-surface, substantially as described.

16. A printing-couple comprising a cylinder
30 arranged to carry a flexible printing-surface and a coöperating cylinder carrying an ink-applying means and a planographic impression-surface, substantially as described.

17. A printing-couple comprising a member
35 arranged to carry a flexible printing-surface and a coöperating member carrying an ink-applying means and a planographic impression-surface, and means for separating the members of the couple, substantially as described.
40

18. A printing-couple comprising a cylinder
45 arranged to carry a flexible printing-surface and a coöperating member carrying an ink-applying means and a planographic impression-surface, and means for separating the members of the couple, substantially as described.

19. A printing-couple comprising a member
50 arranged to carry a flexible printing-surface and a coöperating cylinder carrying an ink-applying means and a planographic impression-surface, and means for separating the members of the couple, substantially as described.

20. A printing-couple comprising a cylinder
55 arranged to carry a flexible printing-surface and a coöperating cylinder carrying an ink-applying means and a planographic impression-surface, and means for separating the cylinders, substantially as described.
60

21. The combination with a printing-couple comprising a member carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, substantially as described.
65

22. The combination with a printing-couple comprising a member carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, and a wiping mechanism for removing surplus moisture from the impression-surface, substantially as described. 70

23. The combination with a printing-couple 75 comprising a member carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, a wiping mechanism for removing surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the ink-applying surface, substantially as described. 80 85

24. The combination with a printing-couple comprising a cylinder carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, substantially as described. 90

25. The combination with a printing-couple comprising a cylinder carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, and a wiping mechanism for removing surplus moisture from the impression-surface, substantially as described. 95

26. The combination with a printing-couple 100 comprising a cylinder carrying a printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, a wiping mechanism for removing surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the ink-applying surface, substantially as described. 105 110

27. The combination with a printing-couple comprising a cylinder carrying a printing-surface and a cylinder carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, substantially as described. 115

28. The combination with a printing-couple comprising a cylinder carrying a printing-surface and a cylinder carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, and a wiping mechanism for removing surplus moisture from the impression-surface, substantially as described. 120

29. The combination with a printing-couple 125 comprising a cylinder carrying a printing-surface and a cylinder carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, a wiping mechanism for removing surplus moisture from the impression-surface, and means for manipulating the 130

wiping mechanism so as to keep it out of contact with the ink-applying surface, substantially as described.

30. The combination with a printing-couple comprising a member carrying a yielding printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, substantially as described.

31. The combination with a printing-couple comprising a member carrying a yielding printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, and a wiping mechanism for removing surplus moisture from the impression-surface, substantially as described.

32. The combination with a printing-couple comprising a member carrying a yielding printing-surface and a member carrying an ink-applying surface and a planographic impression-surface, of means for dampening the impression-surface, a wiping mechanism for removing surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the ink-applying surface, substantially as described.

33. The combination with a printing-couple comprising a member carrying a transfer printing-surface and a member carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, substantially as described.

34. The combination with a printing-couple comprising a member carrying a transfer printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, substantially as described.

35. The combination with a printing-couple comprising a cylinder carrying a transfer printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, substantially as described.

36. The combination with a printing-couple comprising a member carrying a transfer printing-surface and a member carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, a wiping mechanism operating to remove surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the planographic ink-applying surface, substantially as described.

37. The combination with a printing-couple comprising a member carrying a transfer

printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, a wiping mechanism operating to remove surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the planographic ink-applying surface, substantially as described.

38. The combination with a printing-couple comprising a cylinder carrying a transfer printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism cooperating with both planographic surfaces, a wiping mechanism operating to remove surplus moisture from the impression-surface, and means for manipulating the wiping mechanism so as to keep it out of contact with the planographic ink-applying surface, substantially as described.

39. The combination with a printing-couple comprising a cylinder having a printing-surface and a cylinder carrying an ink-applying surface and a planographic impression-surface, of means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing and impression surfaces come into cooperative relation, substantially as described.

40. The combination with a printing-couple comprising a cylinder having a yielding printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing and impression surfaces come into cooperative relation, and a dampening mechanism cooperating with both planographic surfaces, substantially as described.

41. The combination with a printing-couple comprising a cylinder having a yielding printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing and impression surfaces come into cooperative relation, a dampening mechanism cooperating with both planographic surfaces, and means for varying the amount of separation between the cylinders, substantially as described.

42. The combination with a printing-couple comprising a cylinder having a yielding printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing and impression surfaces come into cooperative relation, a dampening mechanism cooperating with both planographic surfaces, a wiping mechanism, and means for manipulating the wiping mechanism

ism so as to cause it to run in contact with the impression-surface and out of contact with the ink-applying surface, substantially as described.

5 43. The combination with a printing-couple comprising a cylinder having a yielding printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing and impression surfaces come into coöperative relation, a dampening mechanism coöperating with both planographic surfaces, a wiping mechanism, means for manipulating the wiping mechanism so as to cause it to run in contact with the impression-surface and out of contact with the ink-applying surface, and means for varying the amount of separation between the cylinders, substantially as described.

15 44. The combination with a printing-couple comprising a cylinder carrying a printing-surface and a cylinder carrying an ink-applying surface and a planographic impression-surface, means for dampening the impression-surface, means for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing-surface and planographic impression-surface have come into coöperative relation, and a

wiping mechanism controlled by the separating means whereby said mechanism is caused to run in contact with the impression-surface and out of contact with the ink-applying surface, substantially as described. 35

45. The combination with a printing-couple comprising a cylinder carrying a transfer printing-surface and a cylinder carrying a planographic ink-applying surface and a planographic impression-surface, of a dampening mechanism coöperating with both planographic surfaces, means including a toggle mechanism for separating the cylinders after the ink-applying surface has passed the printing-surface and before the printing-surface and planographic impression-surface have come into coöperative relation, means for varying the amount of separation between the cylinders, and a wiping-roller connected with and operated by said separating means, whereby said roller is caused to run in contact with the impression-surface and out of contact with the ink-applying surface, substantially as described. 45 50 55

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

JOSEPH WHITE.

Witnesses:

F. W. H. CRANE,
W. F. MORGAN.