H. A. W. WOOD.

ROTARY PRINTING PRESS FOR PRINTING FROM INTAGLIO HALF TONE PRINTING PLATES.

APPLICATION FILED NOV. 15, 1901. RENEWED JULY 8, 1909.

952,060. Patented Mar. 15, 1910.

Fig. 1

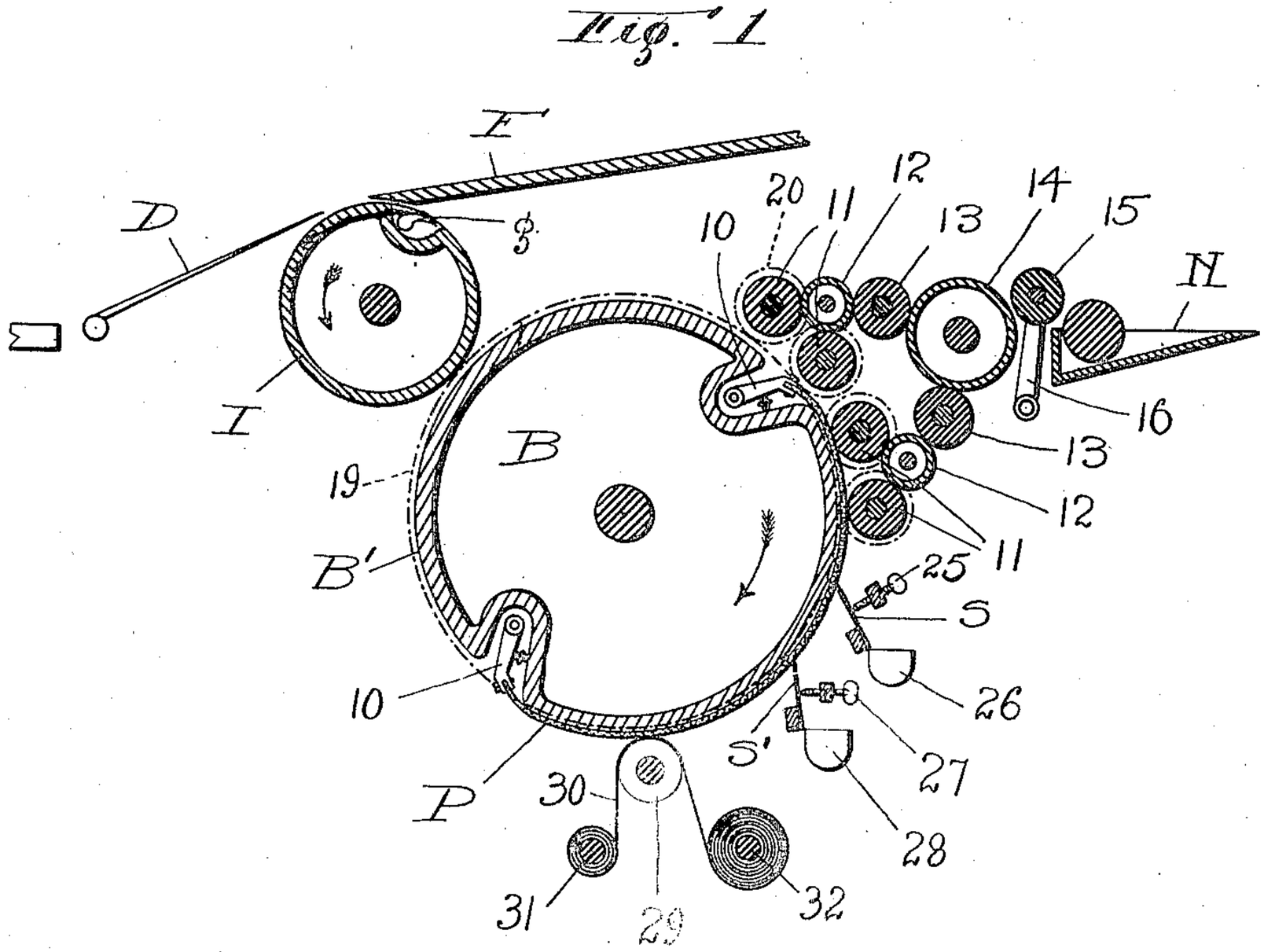
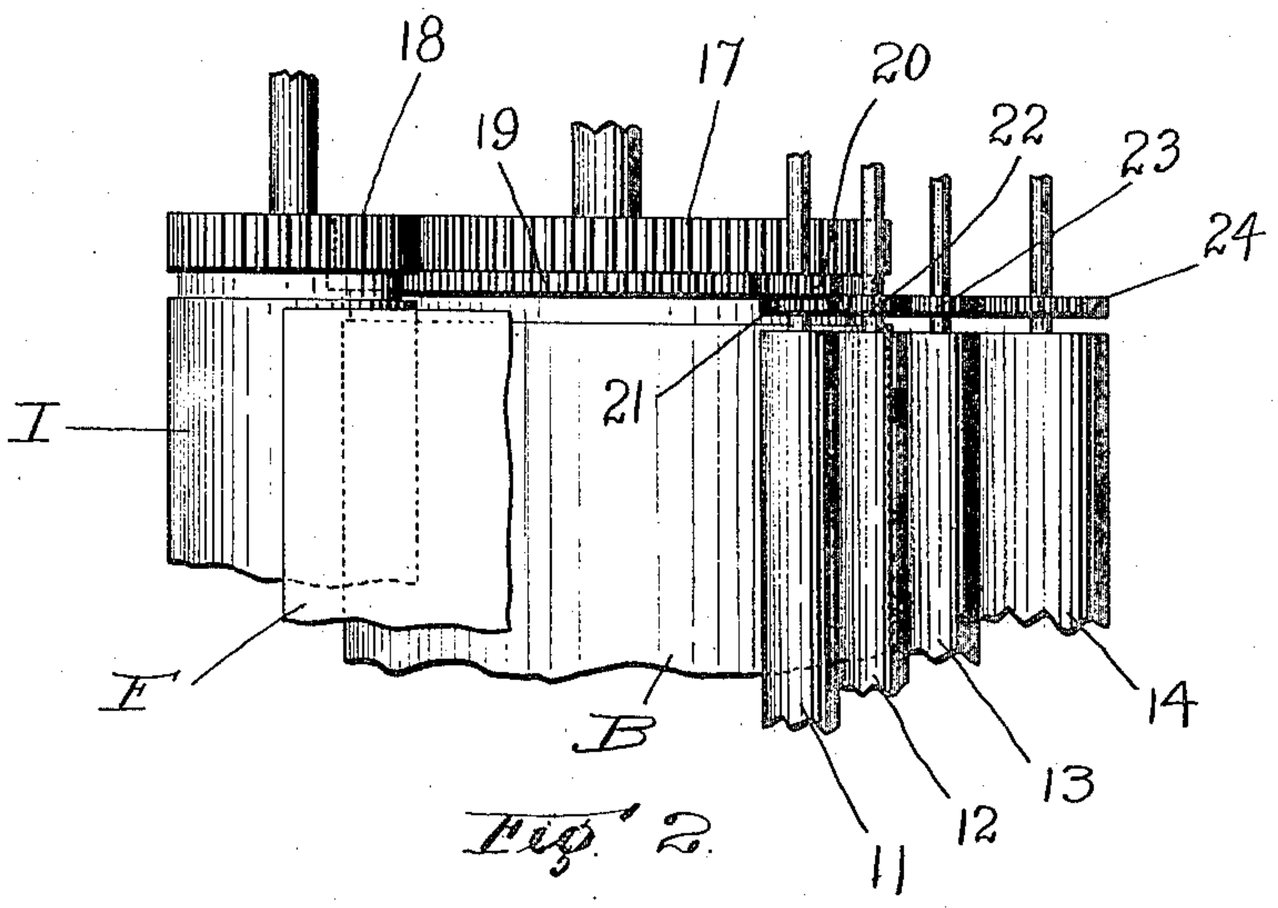


Fig. 2.



Witnesses.
C. F. Wesson.
M. E. Regan.

Inventor.
H. A. Wise Wood.
By
Southgate & Southgate
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ROTARY PRINTING-PRESS FOR PRINTING FROM INTAGLIO HALF-TONE PRINTING-PLATES.

952,060. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed November 15, 1901, Serial No. 82,436. Renewed July 8, 1909. Serial No. 506,616.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Rotary Printing-Press for Printing from Intaglio Half-Tone Printing-Plates, of which the following is a specification.

A new form of printing plate has recently come into use, which consists of a half-tone printing plate, cut or etched in intaglio. So far as I have been informed, all printing from a plate or plates of this character has previously been done with the plate in a flat condition. This method of printing is slow.

The object of my present invention is to provide a rotary printing press, adapted to print from a plate of the character referred to, at great speed.

To practice my invention, I curve the plate, and fasten it upon a cylindrical plate-carrier, and treat it in the following way:—The plate is inked by rubbing the ink into the intaglio portions thereof by inking rollers, which are preferably covered with leather, and which are geared to run faster or slower than the plate, and in the same or an opposite direction to slip thereon, so as to rub the ink into the plate. After the plate is inked, a blade, like a fountain-blade, is pressed against the same to scrape off all the surplus ink, and leave only the ink in intaglio lines. After this is done, the plate is moved into contact with a polisher, which removes the last traces of ink from the surface before it comes into contact with the paper. The plate is then brought into contact with an impression cylinder which carries the paper. By this way of printing great speed is obtained, and a better printing effect, because the printing surface will be curved, and therefore, the pressure of impression will be much greater. In most instances, I contemplate using an additional scraper, set at different pressure, and made of a different material. The first scraper is generally made hard, and is adjusted to take off the main body of the ink, while the second has a gutta-percha or indurated fiber edge.

Referring to the accompanying drawing forming part of this application, I have shown enough of the principal parts of the best form of apparatus now known to me for practicing my invention, to enable one skilled in the art to construct a machine embodying my present idea.

In said drawings, Figure 1 is a sectional elevation of the principal parts of the mechanism, and Fig. 2 is a partial plan view showing the gearing.

Referring to the drawing and in detail, I designates an impression cylinder, which has the usual grippers *g*. Sheets are fed to the same from the feed-board F carried around on the said cylinder, and delivered from the same by the fly D on to a suitable delivery board.

B represents the printing plate carrier, which preferably is made of twice the diameter of the impression cylinder.

P designates the intaglio printing plate.

The printing plate carrier preferably is cut away for about one-half of its surface, as at B′, and has its other surface made long enough to carry and support the printing-plate P.

By making the printing plate carrier B twice the size of the impression cylinder I, and by cutting away one-half of its surface, an efficient form of machine is provided. The impression cylinder will make two revolutions relatively to the printing plate carrier, one revolution to print the sheet, and the other revolution to deliver the sheet.

By the cut away arrangement of the printing plate carrier, the impression cylinder and printing plate carrier can be geared directly together, and coöperate properly without the application of any raising and lowering mechanisms to the impression cylinder.

The printing-plate P is bent in any suitable manner, and is applied to cylinder B and held thereon by straining devices 10—10 arranged in gaps or depressions formed in said printing-plate-carrier B. Each of these straining devices consists of an arm, or a series of arms arranged on a shaft supported in said carrier, each of said arms having jaws to grasp the end of the plate, and suitable screws to adjust said arms to hold the printing-plate P tightly on the printing cylinder.

11 designates the form inking rollers. Four are shown in the present instance as a

desirable number. These inking rollers are preferably covered with leather. The four inking rollers are arranged in two sets of two each, as shown. Co-acting with each is a distributing roller 12, and co-acting with each distributing roller is an ink carrying roller 13, which carrying rollers bear on an ink-drum 14.

15 designates a ductor roll which is mounted in suitable arms 16, and actuated by any of the usual mechanisms to take ink from the fountain N, and lay the same on the ink-drum 14.

The printing plate carrier B carries a gear 17 of a pitch radius equal to the pitch radius of the working surface of the printing plate P, which gear meshes with a gear 18 carried by the impression cylinder I. The gear 18 is of a pitch diameter equal to the diameter of the impression cylinder. By this arrangement the peripheral speed of the printing plate will equal the peripheral speed of the impression cylinder, and the impression cylinder I will make two revolutions for each revolution of the printing cylinder. The impression cylinder I will not contact with the printing plate carrier B, except through the printing plate, on account of the cut away portion B′ of said cylinder. A gear 19 is arranged on said printing plate carrier B just inside the gear 17. This gear is made considerably smaller than the gear 17. Arranged on the form inking rollers 11 are gears 20 which mesh with said gear 19. The gears 20 are considerably larger in diameter than the diameter of said form inking rollers 11, whereby said form inking rollers will have a peripheral speed considerably slower than the peripheral speed of the printing plate, so as to have a wiping action thereon to force the ink into the depressions of the printing plate. This wiping action may be obtained in other ways, as by driving the inking rollers in opposition to the movement of the plate, or in any way to obtain a peripheral slip between the plate and the form inking rollers. But the arrangement just described is the preferred one, as it gives about the proper degree of slip necessary for nice half-tone work. Moreover, I regard this arrangement as far superior to constructions in which the inking rollers are turned at greater speed than the printing plate, because if such a construction should be adopted the tail of the plate or any high place in the plate which is followed by a depression will receive a surplus amount of ink, which will be due to the more rapid surface travel of the inking rollers, and this surplus of ink which may be piled up, so to speak, on the tail of the plate or upon the high points of the plate will be wasted as it will be taken off by the scrapers with no chance of being rubbed or worked into the intaglio lines. Arranged on said inking rollers 11 are gears 21 of a pitch diameter equal to the diameter of said inking rollers, which are geared by gears 22—23—24 on the distributers 12, carriers 13, and ink drum 14, respectively, to drive the cluster of inking rolls at the same peripheral speed.

S designates a suitable scraper. The same is preferably made of a steel blade secured to a cross-bar. Bearing on this blade are a number of adjusting screws 25 by which said scraper can be adjusted to bear with any desired degree of pressure on the printing plate. 26 designates a pot or receptacle, arranged in position to catch the ink scraped off of the printing plate by said scraper S.

I generally employ a second scraper having adjusting screws 27 and a pot 28. This second scraper is generally made out of indurated fiber or hard rubber; the first scraper being used to take off the main body of the ink, and the second to go over the surface again with a more delicate pressure.

29 designates a roll arranged in such position that a blanket preferably made of cheese-cloth or similar material will bear on the plate. This blanket is given a slow movement, and is wound back and forth by suitable rollers 31 and 32, or any suitable mechanism. This blanket will act as a polisher, and will polish the plate, and will remove every trace of ink therefrom, except from the intaglio lines or depressions.

The operation is apparent from the foregoing description.

As the printing plate carrier revolves, the ink will be forced into the depressions of the plate by the slip of the inking rollers thereon, the surplus ink will be scraped off, the plate polished, and the sheet printed by contact of the plate with a sheet carried by the impression cylinder.

Great speed can be obtained with this apparatus, and very fine printing effects, due to the nicety of the inking, and a heavy impression obtainable from a curved plate.

Many other forms of apparatus may be devised by a skilled mechanic without departing from the scope of my invention, as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a device for printing from an intaglio printing plate, the combination of an impression cylinder, a cylindrical plate-carrier coöperating therewith, devices for inking the plate, and two scrapers for removing the surplus ink, one scraper being made of hard material, and the other being made of soft material.

2. In a device for printing from an intaglio printing plate, the combination of an impression cylinder, a cylindrical plate-

carrier coöperating therewith, an inking apparatus for inking the plate, two scrapers, one having a hard bearing blade, and the other a soft bearing blade for removing the surplus ink, and a polisher for polishing the plate before impression.

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

H. A. WISE WOOD.

Witnesses:
SEYMOUR CONOVER,
JAS. H. CRAFT.