H. A. W. WOOD.

INTAGLIO PRINTING CYLINDER.

APPLICATION FILED NOV. 4, 1907.

1,123,055. Patented Dec. 29, 1914.

Fig. 1.

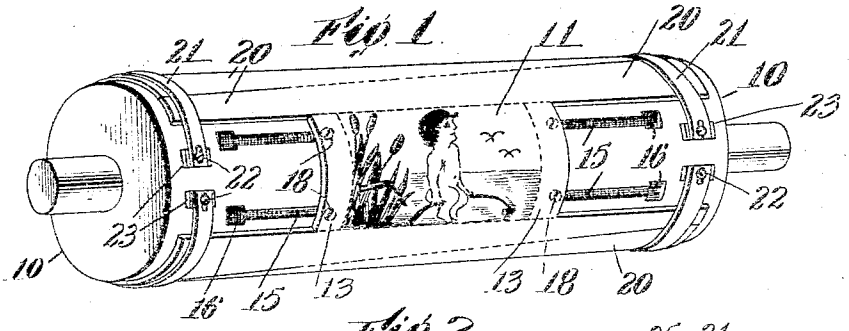
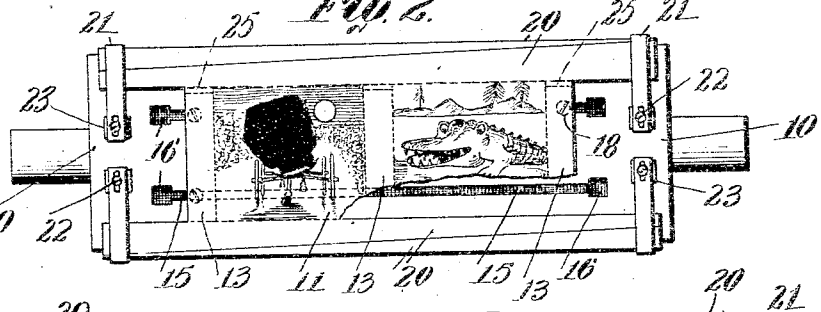


Fig. 2.



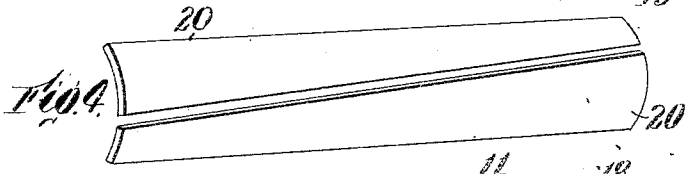


Fig. 4.

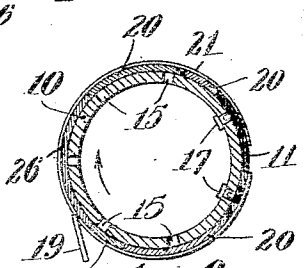


Fig. 6.



Fig. 3.

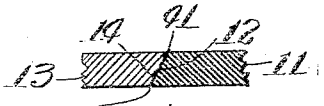


Fig. 7.

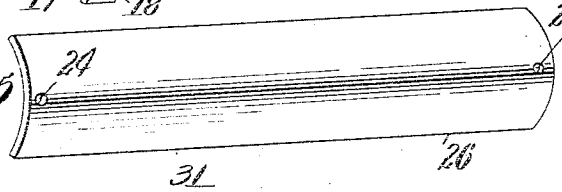


Fig. 5.



Fig. 8.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO WOOD & NATHAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INTAGLIO-PRINTING CYLINDER.

1,123,055. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed November 4, 1907. Serial No. 400,488.

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 Intaglio-Printing Cylinder, of which the following is a specification.

Intaglio printing on rotary presses is now done from continuous cylindrical copper shells secured upon a mandrel. The design, whether etched or cut, is endless so that the shell may produce repeated impressions upon a long length or web of material. To apply this system of printing to typography, such as the printing of paper for books, illustrations or periodicals, involves considerable expense and it is exceedingly cumbersome as compared with relief printing, because the whole shell must be photographed or etched at one time even when it has a large number of illustrations. As the shell is of considerable weight, it is a cumbersome element to handle in this way, especially when different kinds of illustrations are used, located perhaps in an irregular manner about the cylinder. Furthermore, should one of the illustrations become damaged upon the press, it would be necesary to clean off and reëtch the entire cylinder; also where the cylinders are made by one concern and used by another sometimes at considerable distance, the shipment of the whole shell would add considerably to the expense, and the shells being of copper, are exceedingly costly.

The principal object of the present invention is to provide practicable and efficient means whereby this class of work may be done from printing cylinders and other plate carriers provided with one or more intaglio plates which are independently removable. Although certain advantages of securing this result will be obvious from what has been stated, the practical application of the principle involves several difficulties which are overcome by this invention; for example, if separate intaglio plates were put upon a cylinder according to the usual manner of relief plate printing, the refuse ink which the cleaning blade must remove in intaglio printing would soon accumulate between the plates and make unsightly marks upon the paper. Furthermore, the doctor or cleaning blade would snap off the back end of each plate and be suddenly brought up to tension by the front edge of the next plate one or more times during each revolution. As the doctor blade is an exceedingly delicate element of the machine, it is necessary that such treatment of it be avoided. In order to avoid this disadvantage according to this invention, means is provided whereby the doctor blade will run continually against a continuous, uninterrupted, complete, cylindrical or flat surface so that it will not run on surfaces at different elevations during different portions of the revolution, or at least not until after cleaning all the intaglio plates, and so that there will be no cavities except the design in which ink may accumulate. This is done by providing plate-high furniture. In this way clean printing may be done from a plurality of intaglio printing plates and a proper edge be retained on the doctor blade.

Another object of this invention is to provide means whereby the lines between the intaglio plates and the furniture and between the different parts of the furniture, which cannot be entirely avoided by any closeness of fit of the parts will be prevented from inking up and printing, as they would otherwise do.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying sheet of drawings which show certain preferred forms of the invention and in which,

Figure 1 is a perspective view of a printing cylinder having but one intaglio plate secured thereon in accordance with this invention. Fig. 2 is an elevation of the same showing how a plurality of plates may be secured thereto. Fig. 3 is a perspective view of a segmental intaglio plate and two clamps therefor. Fig. 4 is a similar view of a pair of filling pieces used on both sides of the plate. Fig. 5 is a similar view of a back piece. Fig. 6 is a central transverse sectional view of the construction shown in Fig. 1. Fig. 7 is a sectional view on an enlarged scale showing a joint between the plate and clamp, and Fig. 8 is an elevation of a cylinder showing another way in which the invention may be applied showing several spaces, in part of which plates are indicated.

Although the invention is capable of general use Figs. 1 and 2 illustrate it as applied

to printing cylinder 10 upon which one or more segmental intaglio printing plates 11, are to be placed. When applied to a cylinder or mandrel, these plates are of curved segmental form so as to fit the cylinder and are intended to be held thereon in any desired position so as to form the impression of the design or designs in any desired location on the paper. For this purpose, the intaglio printing plate 11 is provided with beveled end surfaces 12 and clamps 13 are employed of the same general segmental shape as the plate and of the same length as the plate. These clamps are provided with inwardly slanting edge surfaces 14 adapted to fit over the corresponding surfaces 12, as indicated in Fig. 7, to hold the intaglio printing plate in position.

The form of the invention shown in the first six figures represents a cylinder adapted to take plates of varying sizes. It is practicable to arrange to have the printing plates of definite or standard dimensions, as for example, ten, twelve, fourteen and sixteen inches long, it being understood that the width of the plate longitudinally of the cylinder may be varied, either in standard dimensions or otherwise, as desired. Accordingly, clamps preferably are kept in stock of the different standard widths which the printing plates are likely to have. These clamps may be held on the cylinder in any desired way. The drawings illustrate a preferred construction for this purpose consisting of parallel longitudinal T-shaped slots 15 extending along the cylinder and having enlarged openings 16 at their ends. These slots are located at intervals around the cylinder and are adapted to receive heads 17 with which the clamps are provided. These heads may be secured rigidly to the clamps so that they may be put into the openings 16 to guide the clamps properly up to the plate, or they may be removable. In the latter case, the clamps are fixed in position by means of screws 18 which screw into the heads 17 and tighten them against the under sides of the T-slots 15. When the heads are integral the screws are employed for securing the clamps in adjusted position.

In order that the doctor blade 19 may pass over the intaglio plate in the usual manner and clean the furniture, preferably without passing from a surface of one height to a surface of another height, the clamps are made exactly plate high; that is, the clamps and printing plates form one continuous cylindrical surface. In the same way, wedge-shaped filling pieces 20 which are provided at both ends of each printing plate and secured in position in any usual way, (as for instance by means of bands 21) are exactly plate high. The ends of the bands may be secured in any way, as by flat headed screws 22 passing through slots into blocks 23 on the cylinder. When the cylinder is used in this way for a small plate on a large cylinder, a straight segmental back piece 26 is employed also exactly of plate height. This piece is securely fixed in position by screws entering counter-sunk openings 24 in the back piece or in any other convenient manner. These parts are made up so as to entirely surround the cylinder and form a complete cylindrical surface so that the doctor blade will engage a perfect, smooth, uniform, continuous surface throughout its travel from which it may remove all ink, and by which it will not be subject to any of the changes of tension above mentioned. It will be seen that this result is obtained simply by the use of uniform plate-high furniture surrounding the printing plate or plates and surrounding the printing cylinder. Thus a continuous bearing surface for the doctor blade is secured although each one of the independent printing plates may be removed from among the furniture and replaced at will. In order to use one or more small plates upon a large cylinder in this way, it is necessary only to have the clamps of the same length as the plates or if they are shorter to fill in with other full height pieces 25, and to have the filling strips as long as the plate may happen to be wide. Whatever may be the width of the plate to be run, the opening of the fountain is usually made a trifle shorter so that no ink shall be supplied much beyond the edges of the plates. In this way, there is no excess of ink at any of the sides to cause smudging.

The description so far given relates chiefly to a cylinder for a press adapted to take plates of varying size for use in job printing. In order to take plates of a standard uniform size for use by the newspaper, book or periodical printer, a slightly different construction is preferred, although the same invention applies to it. In this case, reference being had to Fig. 8, straight filling pieces 30 are employed corresponding to the margins which run transversely to the web. These are secured to the cylinder. Laterally adjustable clamps 31 are employed in connection with them. These may be adjustable along T-slots 32 by means of heads and screws 33 in the same manner as above or in any other desired way. For the center longitudinal margin, clamps 35 are preferably used fixed to the cylinder in any convenient way. These clamps have beveled edges like the clamps 13 and all the clamps and filling pieces are so arranged as to permit cleaning by the doctor blade, preferably being plate high, as described above. By this arrangement, if the plates are made of a given length so that they fit between the straight filling pieces, the clamps 31 can

be brought up to hold them in position. Thus, the entire surface of the cylinder is smooth and continuous as in the other case, as if it were actually made of a continuous shell and thus it is possible to print successfully from a plurality of intaglio plates associated together upon a single printing member.

The only difficulty with constructions made as above described, is that there may be thin cracks or interstices between the plates which can not be entirely removed by any accuracy of fitting. These under some circumstances will print fine hair like lines, which upon fine work may be objectionable as the doctor blade will leave ink in them. In order to overcome this difficulty these cracks are filled with properly prepared cement, wax, or similar preparation after the plates are in position and then are quickly rubbed smooth so that as soon as the cement hardens, which will require but an instant, no interstices except those of the designs, will remain to accumulate ink. This is indicated in Fig. 7 where the minute space 40 between the plate 11 and the clamp 13 is filled with the cement 41. The screw heads may be treated in the same way.

It will be seen that this invention whether carried out in the particular ways set forth or in any other way within the scope of the claims, provides means whereby one or more intaglio plates may be mounted upon a plate cylinder or carrier in such a way that intaglio printing may be accomplished with facility equal to that with which relief printing is now done and the fine results of intaglio printing obtained in newspaper and periodical work, as well as on job presses by convenient and inexpensive means.

When the invention, or any part of it, is applied to flat plates, which may easily be done in substantially the manner described, they are held on a support in a similar manner and the furniture is arranged in substantially the same way, preferably being smooth and plate high.

While I have illustrated and described certain preferred forms of the invention, I am aware that many modifications may be made therein by any person skilled in the art without departing from the scope thereof as expressed in the claims. Therefore, I do not wish to be limited to the particular forms shown, but

What I do claim is:—

1. The combination with a printing plate cylinder, of means thereon for clamping a segmental intaglio printing plate thereto, said means comprising a pair of segmental clamps having cylindrical outer surfaces of the height of the plate to be clamped.

2. The combination of a printing plate cylinder having longitudinal slots therein, transverse clamps for segmental intaglio printing plates adapted to be held adjustably in said slots, longitudinal filling pieces adapted to be supported on the cylinder adjacent to said clamps, and means for holding the filling pieces, said clamps and filling pieces having curved surfaces constituting a portion of the same cylindrical surface.

3. The combination with a printing plate cylinder, of clamps for segmental intaglio printing plates, filling pieces, means for holding the filling pieces on the cylinder, and a back piece secured to the cylinder, said clamps, filling pieces and back piece having curved outer surfaces constituting portions of the same cylindrical surface, the clamps being in contact with the filling pieces.

4. The combination with a printing plate cylinder having longitudinal T-shaped slots therein, of clamps having headed guiding pieces engaging in said slots, and means for securing said clamps in adjusted positions along the slots, said clamps having inwardly beveled edges for engaging the beveled edges of the segmental intaglio printing plates to be held thereby, the outer surfaces of the clamps being flush with the corresponding outer surfaces of the plates when fixed in position on the cylinder.

5. The combination with a printing plate cylinder having longitudinal T-shaped slots therein, of clamps having headed guiding pieces engaging in said slots, and means for securing said clamps in adjusted positions along the slots, said clamps having inwardly beveled edges for engaging the beveled edges of the segmental intaglio printing plates to be held thereby, the outer surfaces of the clamps being flush with the corresponding outer surface of the plate, and means for filling up the interstices between the clamps and plate and bringing the same to the level thereof, whereby said clamps and plate will present a complete unbroken cylindrical surface.

6. The combination with a printing plate cylinder, of clamps for segmental intaglio printing plates, filling pieces, means for holding the filling pieces on the cylinder, a back piece secured to the cylinder, said clamps, filling pieces and back piece having curved outer surfaces constituting portions of the same cylindrical surface, and a filling of cement in the interstices between the plate and furniture and between the several pieces of furniture smoothed off to the level thereof, whereby the plate and furniture constitutes a continuous unbroken cylindrical surface.

7. The combination of an intaglio printing plate, plate high furniture surrounding the plate, and a filling preparation in the interstices between the plate and the pieces of furniture whereby the plate and furniture will constitute a continuous unbroken surface.

8. A printing cylinder having furniture

secured thereto, the outer surfaces of all the furniture registering with each other and constituting a cylindrical surface, the interstices between the pieces of furniture being filled with cement or the like brought to the level of the furniture, whereby said cylindrical surface is complete, unbroken and continuous.

9. The combination with a printing plate cylinder having T-shaped slots therein, of clamps having headed guiding pieces engaging in said slots, and means for securing said clamps in adjusted positions along the slots, the outer surfaces of the clamps being flush with the corresponding outer surface of the plate, and means for filling up the interstices between the clamps and plate and bringing the filling to the level thereof, whereby said clamps and plate will present a complete unbroken cylindrical surface.

10. The combination with a printing plate cylinder having T-shaped slots therein, of clamps having headed guiding pieces engaging in said slots, and means for securing said clamps in adjusted positions along the slots, the outer surfaces of the clamps being flush with the corresponding outer surfaces of the plate when fixed in position on the cylinder.

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

H. A. WISE WOOD.

Witnesses:
HARRIET LINDSAY,
ANNIE B. WALTERS.