May 11, 1926. 1,583,825

A. B. DAVIS

METHOD OF AND DEVICE FOR REGISTERING PRINTING PLATES

Filed August 28, 1924 2 Sheets-Sheet 1

Fig. 1

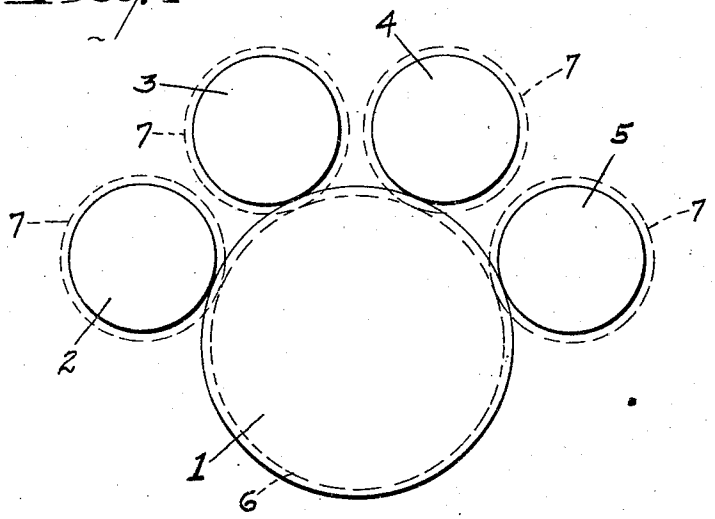


Fig. 2

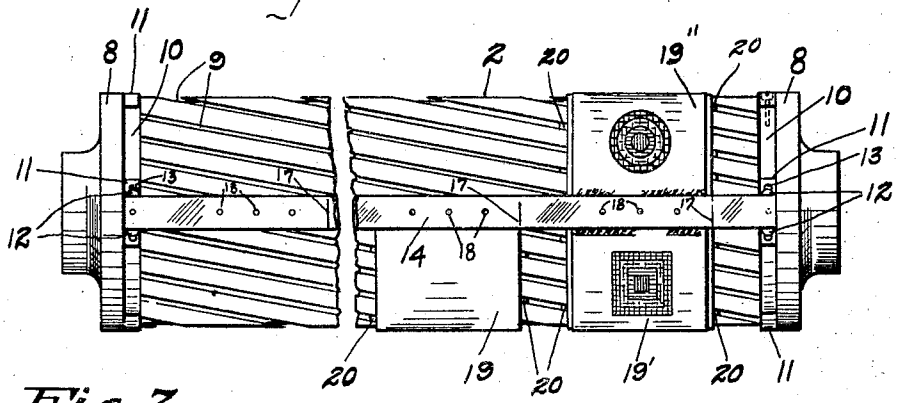
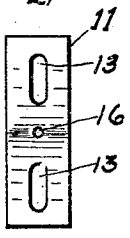


Fig. 7



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Fig. 3

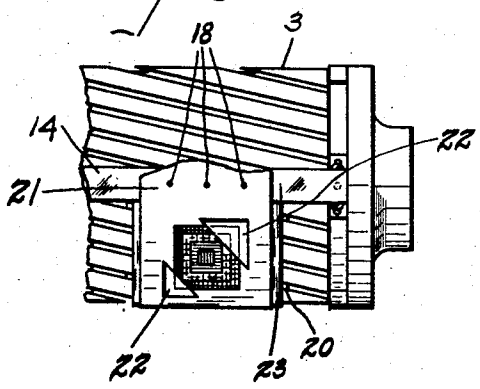


Fig. 4

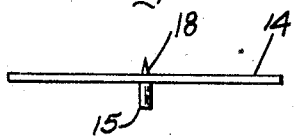


Fig. 5

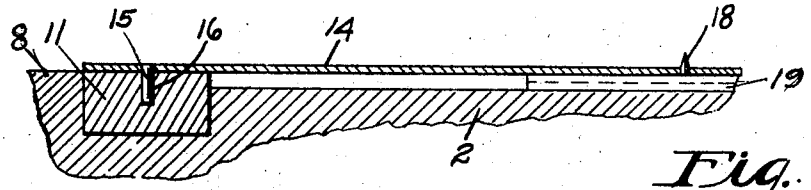
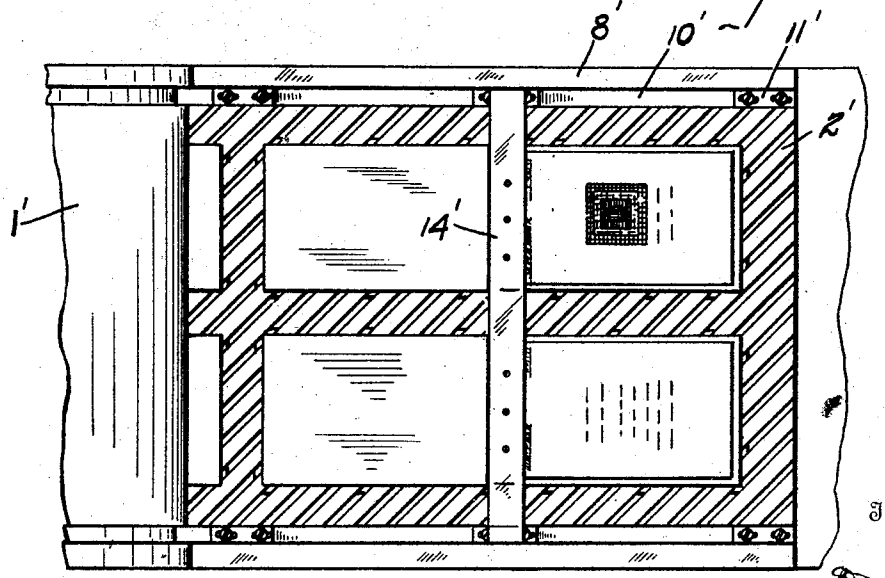


Fig. 6



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Patented May 11, 1926. 1,583,825

UNITED STATES PATENT OFFICE.

ARTHUR B. DAVIS, OF SPRINGFIELD, OHIO.

METHOD OF AND DEVICE FOR REGISTERING PRINTING PLATES.

Application filed August 28, 1924. Serial No. 734,555.

My invention relates to means for and the method of setting the printing plates on the plate holding bases of printing presses.

One of the objects of the invention is to provide a simple and effective method of setting the plates on the various bases of a multi-color press such that the various colors will accurately register.

Another object of the invention is to provide for quickly and easily setting the plates on the base such that the matter of the printed pages on one side of a printed sheet will accurately register with the margins of those pages on the opposite side of the sheet.

A further object is to provide devices for registering the plates in the manner referred to which will be of a simple and inexpensive character which can be readily manipulated without the necessity of calculation or any unusual skill upon the part of the pressman.

In the accompanying drawings:

Fig. 1 is a diagrammatic view of the packing cylinder and the various plate cylinders of a multi-color press.

Fig. 2 is a view of one of the plate cylinders showing my improved registering device applied thereto.

Fig. 3 is a view of a portion of another one of the plate cylinders illustrating further the manner of use of my method and devices.

Fig. 4 is an end view of the straight edge.

Fig. 5 is a longitudinal section of a portion of one of the plate cylinders, a portion of the straight edge and one of the position blocks for the same.

Fig. 6 is a plan view of a portion of a bed press showing my improvements applied thereto.

Fig. 7 is a detail of one of the blocks for holding the straight edge.

This invention is applicable to either a cylinder type of press or to the bed type.

In Fig. 1 there is shown a packing cylinder 1 and four plate bases in the form of cylinders 2, 3, 4 and 5 of a multi-color press. The plate cylinders are geared to a large gear connected with the packing cylinder so as to rotate at the same speed, the gears being shown in dotted lines at 6 and 7. In Fig. 2 there is shown one of the plate cylinders which will be considered the one marked 2, which makes the first impression. Each of these plate cylinders is of a conventional type, 8 representing the bearer rings, 9 spiral grooves in the periphery of the cylinder, and 10 annular grooves between the cylinder proper and the bearer rings.

In carrying out my invention, I place in the annular groove 10 a series of blocks 11, a block in one groove 10 being exactly in line with a block in the other groove and constituting with it a coacting pair of blocks. Each pair of blocks is so positioned with respect to the timing of the folder or cutting knife of the press that the space on the cylinder between the blocks represents the space which exists on the cylinder between the horizontal edges of the folio lines of the adjacent plates, such space being generally called the margin; a pair of blocks being located at each of said spaces. Each of the blocks is secured in position by screws 12 which pass through openings 13 in the blocks and are threaded in the bottom of the grooves 10; the openings 13 being preferably elongated to permit proper positioning of the blocks.

Cooperating with the blocks is a straight edge 14 formed of a strip of metal, each end of which has a pin 15, which pins register with openings 16 in the blocks. The blocks are so positioned that the openings 16 in the blocks of one cylinder are exactly timed with the openings of the blocks of the other cylinders. By this is meant that the space on a cylinder between any two opposite openings 16 will pass over the paper being printed at exactly the same point as the space between the openings of a certain pair of blocks on the next succeeding cylinder. The straight edge also has indicating lines 17 and a plurality of series of sharp pins 18 for a purpose to be explained, and the width of this straight edge represents the exact distance between the folio lines at the tops of adjacent pages with the pins 15 and holes 16 on the center line between the margins.

To assemble the plates on the key cylinder, which will be considered the one marked 2 in the present case, the straight edge is placed in position as shown in Fig. 2 with its pins 15 in the holes 16 of a pair of blocks, and using the edges thereof and the indications 17 as guides, the plates,

three of which are shown at 19, 19′ and 19″ may be readily positioned and locked in place by the usual lugs 20 in the spiral grooves. In positioning the plates the same are moved until the folio lines (date and page number) at the top of the plate, when the plates bear such folio lines, register with the edges of the straight edge and one side of the printed matter or other characters on the plate are in registry with the indication 17. It should be explained that the margins of printing plates are beveled from the outer edge to the type high part which enables the plates to be slid under the straight edge until the folio lines of the plates come in line with the straight edge. The straight edge is then removed to another pair of blocks and the same procedure followed until all of the plates on the key cylinder have been positioned. Thus, it will be seen that a simple method, requiring only simple and inexpensive apparatus, is provided for positioning the plates on the key color cylinder in a manner which will cause the printed pages on both sides of the sheet to exactly register, and this method applies not only to multi-color presses but also to presses in which but a single color and plate base are employed.

The plates on the key cylinder having been properly positioned, the method of positioning the plates on the next succeeding plate cylinder will now be explained. Before the plates have been placed on the first or key cylinder an offset proof is taken of each plate made on paper in a well known way; that is, a proof sheet having an impression of the plate on the back side. One of these proof sheets is indicated at 21 in Fig. 3, having been taken from the plate 19′ at the right in Fig. 2. The proof is cut away at least two points, shown by the triangular-shaped slits 22, so as to expose portions of a plate placed beneath it, and the proof is then placed upon and brought in registry with the plate 19 on the cylinder 2 and impaled in this position on the pins 17 of the straight edge. The straight edge and proof are then removed from cylinder 2 and placed on cylinder 3 (Fig. 3) and the plate 23 corresponding in matter to the plate 19′ is then positioned beneath the proof sheet until corresponding parts thereof come in registry with the proof which can easily be determined by observing parts of the plate exposed by the cut-away portions of the proof. It will be noticed that the inner side of one slit has been cut so as to register with the corner of one of the squares of the figure which appears on the plate and the inner side of the other slit registers with one side of one of the other squares, and in positioning the plate 23, the plate will be moved until the same points register with the proof. The selection of the points to be brought in registry is purely arbitrary, at least two prominent points on the plate 19 which appear on the plate 23 being chosen.

When positioning the plates upon the initial or key cylinder, in the event that a printing plate does not bear a folio line, as is the case with some plates, a somewhat different plan is pursued to position such a plate. A sheet of paper cut to the size of the matter of a fully occupied plate is in this case provided, such sheet of paper having an additional flap at the top for the purpose of enabling the sheet to be impaled upon the sharp pins of the straight edge, a crease separating the flap from the main body of the sheet at the folio line. This sheet of paper bears a properly positioned reproduction of the printing plate preferably by placing thereon an offset proof of the printed matter or design which appears on the plate. This sheet of paper at the place where the reproduction appears is cut away in the same manner previously described in connection with the proof 21 and the sheet of paper is then impaled upon the sharp pins of the straight edge with the crease or folio line in line with the side of the straight edge. The cut is then brought in registry with the reproduction thereof which appears on the sheet of paper and locked in position on the base. When such a method is employed of securing the key plate in position the same proof can be employed for positioning corresponding plates on the other bases.

While I have shown and described my method and apparatus as used with grooved bases, it is to be understood that the invention is equally applicable to bases of other types such as a base provided with fixed stops. In this connection it should be explained that with the latter type of base, the stops coact with the edges of the plates, requiring the edges of the plates to be either planed off or extended by soldering additional metal thereon and with this method it requires the taking of numerous press proofs until the required registration is secured. With my method, plates on any kind of a base may be accurately registered without the necessity of making test runs of the press during the installation of the plates.

In Fig. 6 my improved devices are shown applied to a base in the form of flat bed in which 1′ represents the packing cylinder, 2′ the bed, 8′ the bearer ring, 10′ the grooves in which the blocks 11′ are secured and 14′ the straight edge. The exact method of registering the plates is followed with the flat bed process as with the cylinder process as before described.

Having thus described my invention, I claim:

1. The method of placing printing plates upon a base consisting in providing a

straight edge of a width equal to the width of the margin between portions of adjacent plates corresponding to the folio lines, positioning said straight edge across the base in registry with the place thereon which corresponds with such margins, and then positioning the plates on said base by bringing the portions thereof corresponding to the folio lines in line with the edge or edges of said straight edge.

2. The method of registering printing plates consisting in properly positioning a plate upon a base, placing a reproduction, such as a proof sheet, of said plate upon a second base in position to register with the impression made by the plate on said first base, and positioning another plate on said second base in registry with said reproduction.

3. The method of registering printing plates consisting in properly positioning a plate upon a base, cutting away portions of a reproduction, such as a proof sheet, of said plate, placing such reproduction upon a second base in position to register with the impression made by the plate on said first base, and positioning a second plate on said second base in registry with said reproduction by exposing a part of said second plate by reason of the cut-away parts of such reproduction.

4. The method of registering printing plates consisting in temporarily securing a guide to a printing base, positioning a plate on said base as determined by said guide, securing a proof sheet of said plate to said guide in registry with said plate, transferring said guide and sheet to predetermined fixed points on a second printing base to position the sheet at a point to register with the impression made by said plate, and securing a second plate to said second base in registry with said proof sheet.

5. The method of registering printing plates consisting in cutting away parts of a reproduction, such as a proof sheet, of said plate, placing the reproduction on said plate and bringing it in registry therewith by the aid of the portions of said plate exposed by the cutaway portions of said reproductions, attaching the reproduction while still in registry with said plate to a removable member on the plate base which occupies a predetermined relation to said base, removing the said member and the attached proof to another base and applying the member thereto at a predetermined point to position the reproduction at a point to register with the impression made by the plate on the first base, and then adjusting another plate corresponding in matter to said first plate by causing said second plate to register with said reproduction by the aid of the portions of said second plate exposed by said cutaway portions of said reproduction.

6. In a matching device of the character described, a plurality of printing plate bases, a straight edge, a plurality of sets of holding devices on each base for positioning and holding the straight edge thereon, each set of holding devices being located at a known place on each of said bases to position the straight edge in predetermined relation thereto, and means associated with said straight edge arranged to be brought in registry with a printing plate on one base and carried with said straight edge to a second base for the purpose of positioning a printing plate on said second base by bringing said plate in registry therewith.

7. In a matching device of the character described, a plurality of printing plate bases, a straight edge, means on each base for positioning and holding the straight edge in predetermined relation with said base, said means being so located as to position the straight edge at a space on said base representing the cross margins of the pages, and means associated with said straight edge for enabling a plate on one base to be brought in registry with a properly adjusted plate on another base by matching said means with said adjusted plate and moving the other plate into registry therewith.

8. In a registering device of the character described, a plurality of printing plate bases, a plurality of blocks carried by said base in predetermined position thereon, said blocks being arranged in pairs with the blocks of each pair located on opposite sides of the base, a straight edge, and means for holding said straight edge associated with any pair of blocks, each pair of blocks being so located with respect to the base as to position said straight edge along the line of the cross margins of the pages.

9. In a device of the character described, the combination with a base provided with a plate bearing surface and grooves on each side thereof, of a plurality of blocks secured in said grooves, said blocks being arranged opposite each other so as to be in pairs, a straight edge, and interengaging means between the ends of said straight edge and said blocks whereby said straight edge may be positioned across the plate bearing surface of said base, said blocks being so located as to position the straight edge at the page margins.

10. In a matching device of the character described, the combination, with a plurality of printing plate bases, a straight edge, means for removably attaching said straight edge in predetermined positions on said bases, said straight edge being provided with a series of sharp pins, in connection with a proof sheet adapted to be impaled on said pins after being brought in registry with a printing plate which has been positioned on a base by the aid of said straight edge so that

the proof sheet and straight edge may be transferred to a second base and placed in position thereon in registry with the plate on said first base for the purpose of matching therewith another plate on said second base.

11. In a matching device of the character described, the combination with a plurality of printing plate bases, of a straight edge, means on each cylinder for positioning the straight edge in predetermined position thereon, in connection with a reproduction, such as a proof sheet, of a plate positioned on the initial cylinder, means for attaching the reproduction to the straight edge after it has been brought in registry with said plate, whereby the straight edge and reproduction may be transferred to another base and a second cut matched with the reproduction to properly position the same on said second base.

In testimony whereof, I have hereunto set my hand this 25th day of August, 1924.

ARTHUR B. DAVIS.