Sept. 8, 1959 R. W. MULCAHY 2,902,770

REGISTERING MEANS FOR MULTICOLOR PRINTING

Filed Dec. 28, 1955 2 Sheets-Sheet 1

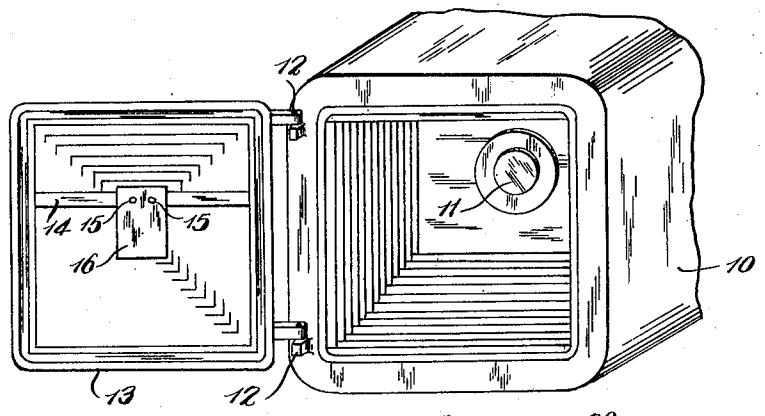


FIG. 1

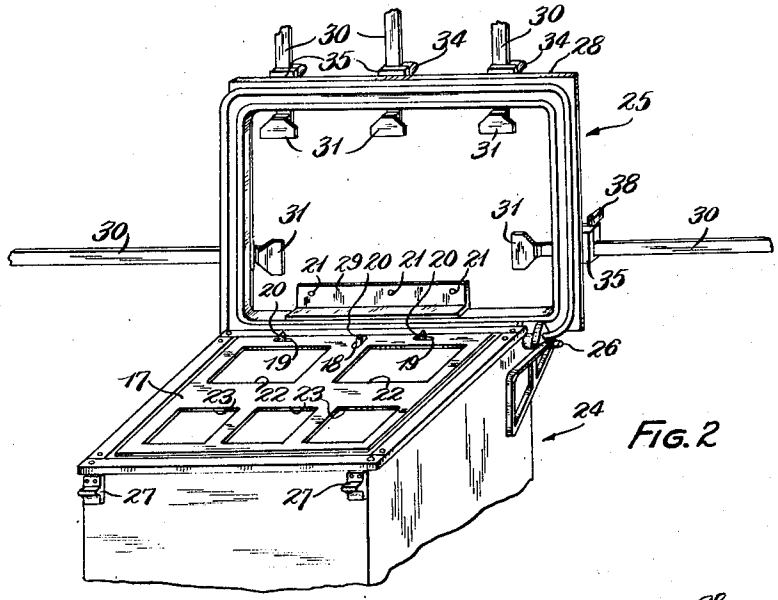


FIG. 2

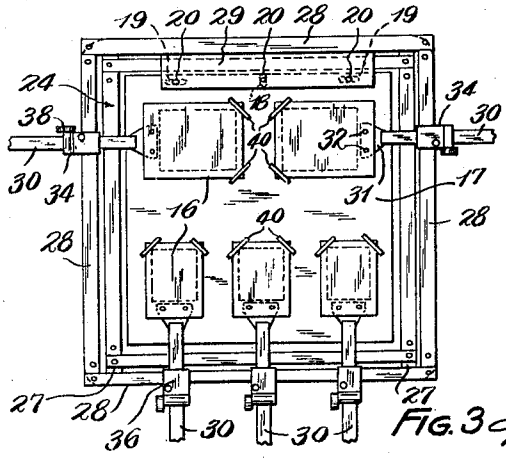


FIG. 3

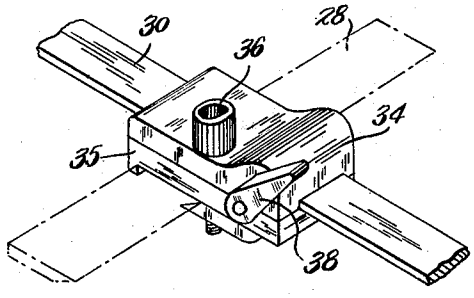


FIG. 4

INVENTOR.
RAYMOND W. MULCAHY
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

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REGISTERING MEANS FOR MULTICOLOR PRINTING

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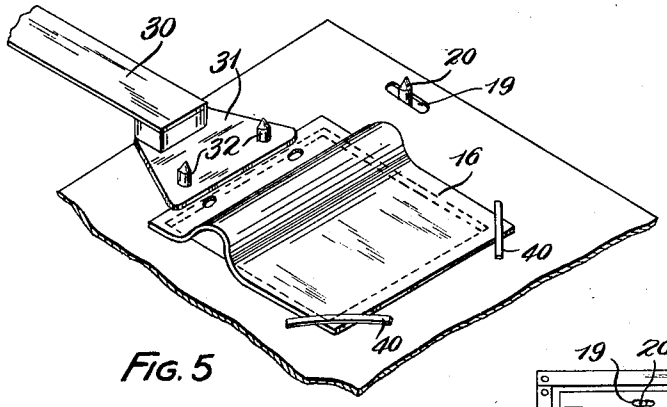


FIG. 5

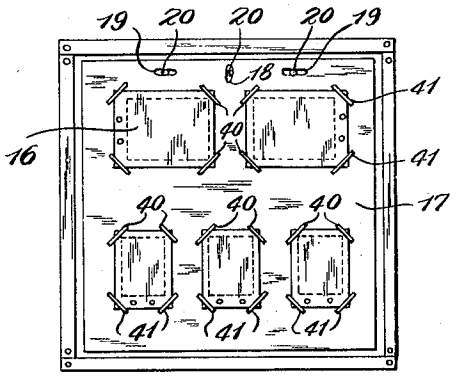


FIG. 7

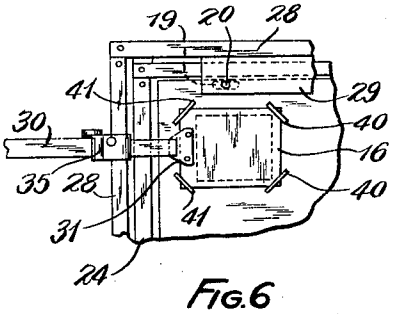


FIG. 6

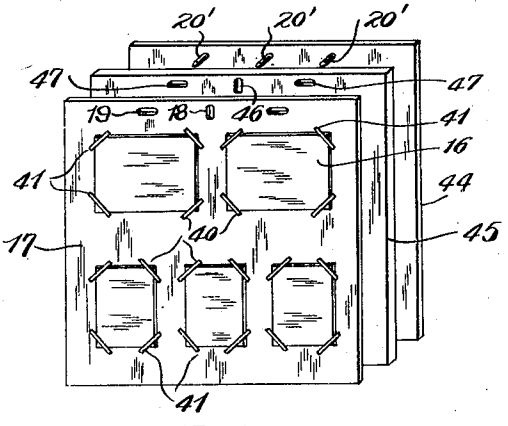


FIG. 8

INVENTOR.
RAYMOND W. MULCAHY
BY Hudson, Boughton, Williams, David & Hoffmann
ATTORNEYS

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REGISTERING MEANS FOR MULTICOLOR PRINTING

Raymond W. Mulcahy, Cleveland Heights, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio, a corporation of Delaware

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3 Claims. (Cl. 33—184.5)

This invention relates to improvements in a method and means for making and using plates for multicolor printing. It has to do particularly although not exclusively with the preparation of printing plates for making multicolor prints where each print comprises a plurality of different images, that is, reproductions of separate subjects on a single sheet. One example of work which may be done to advantage by the invention is the printing simultaneously of a considerable number of colored images, spaced irregularly in a lithographic plate layout.

One of the objects of the invention is the provision of a novel method and means including mechanical locating elements and the use thereof for positioning a series of negatives or positives for a given color upon a backing sheet by means of which a lithographic printing plate for that color may be made photographically in a contact printing frame.

Another object is the provision of a method and means for quickly registering the negatives for the second and other colors on further backing sheets by means of the same locating elements in precisely the same positions as on the first backing sheet, the backing sheets and the printing plates to be made therefrom having means for identical registration, which latter registering means will lend itself readily to registering the plates upon the plate cylinder or cylinders of a printing press.

Another object is the provision of a stripping table which takes the backing sheets in registered position and embodies adjustable negative locating bars which when set in registering position with the negatives for the first backing sheet may be locked in position and used to register the negatives for the succeeding backing sheets which carry the negatives for the remaining colors.

Still another object of the invention is to provide pin registration means for locating negatives in position over a backing sheet, which registration means is adjustable and adapted to accommodate various sizes and shapes of negatives.

A still further object is to provide means for interposing registering pins between a backing sheet and a negative to be mounted thereon, said negative having holes therein mating with said pins for holding the negative in registered position while it is being partially attached to said backing sheet, and the means carrying said pins being constructed and adapted to permit said negative to be removed from said pins and completely attached to said backing sheet.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which

Fig. 1 is a perspective view of the rear end of a camera in which the films for color separation negatives may be exposed photographically.

Fig. 2 is a fragmentary perspective view of a registering and stripping table which may be employed in connection with the invention, an opaque backing sheet with windows cut therein being shown in registered position on the table.

Fig. 3 is a plan view of the table with negatives positioned over the windows of the backing sheet and registered with negative locking bars locked to a frame that is hinged down into predetermined position on the table.

Fig. 4 is a fragmental perspective view on an enlarged scale of a locking means for holding a negative locating bar in position on the frame.

Fig. 5 is a perspective view also on a large scale illustrating a step in the method of mounting a negative on a backing sheet.

Fig. 6 is a fragmental plan view illustrating a further step in the method.

Fig. 7 is a plan view showing a plurality of negatives for one color mounted on a backing sheet, and

Fig. 8 is a perspective view of a lithographic plate and backing sheet having perforations adapted to register with locating pins in a contact printing frame, only the registering portion of which is shown.

In Fig. 1 of the drawing a camera is shown schematically at **10**. The camera lens is indicated at **11**. On the rear of the camera frame there is mounted, as by means of a pair of hinges **12**, a camera back **13** provided with a bar **14** that may be adjusted up and down and carries a pair of spaced pins **15**. The photographic films to be used in the camera are uniformly punched with perforations to fit these pins. Films of different size may be used, but a given film such as marked **16** in the drawing is preferably centered in line with the lens by adjusting the bar **14**. When that bar is once adjusted for making a set of color separation negatives from a given piece of copy it remains fixed until the different negatives for that set have been exposed.

If the print to be produced comprises a number of different images, for example five, as indicated herein, a set of color separation negatives is made for each image or piece of copy, and all of the negatives are developed. Next, an opaque backing sheet **17** punched with slots **18** and **19** is placed on a registering and stripping table **24** with the slots receiving pins **20** projecting upwardly from the table in fixed position, by which means the backing sheet is accurately disposed in a definite position on the table. Slots **19** are aligned and parallel to that edge of the sheet **17** along which they are provided. The slots are of the same width as the diameter of pins **20** and thus register the backing sheet in a direction perpendicular to the slots. Slot **18** is at right angles to slots **19** and is of the same width to provide registration in the direction perpendicular to that provided by slots **19**. A series of windows **22** and **23** are cut through the backing sheet in selected positions, this being done while the backing sheet is mounted upon the pins **20**. Each of these windows is sized somewhat smaller than the negative to be accommodated so that the negative will be masked by the backing sheet.

A rectangular frame **25** somewhat larger than the stripping table **24** is mounted at the rear of the table on hinges **26**, one of which is shown in Fig. 2. When the backing sheet **17** with its cutouts **22** and **23** therein is in position on the table the frame **25** may be swung down on its hinges so that holes **21** in a bracket **29** on the frame fit over pins **20** and serve to register the frame with the table. It is shown in this position in Fig. 3, the forward end of the frame being supported on stops **27**. Frame **25** comprises metal bars or straps **28** on its upper surface, one on each of the four sides of the frame. The upper surfaces of the straps **28** are preferably at the same level as table **24** when the frame is in its lowered position illustrated in Fig. 3.

Negative locating bars **30**, in any desired or necessary number, are supplied for use in connection with the

stripping table. The bars may be long enough to reach from one strap 28 approximately across the table, although as a rule they do not need to extend that far. At its inner end each bar carries a plate or shoe 31 wherein are mounted two pins 32 which are dimensioned and spaced to receive the perforations in the negatives. In other words the pins 32 correspond precisely in size and spacing with the pins 15 in the camera. For each bar there is a bracket formed in upper and lower halves 34 and 35 in one of which there is a groove to receive the bar. The lower half has a transverse groove which fits the strap 28. This bracket is adjustable along the strap 28 and may be locked in adjusted position thereon by means of a screw having an operating knob 36. The bar 30 is adjustable at right angles to the strap 28, clamping means for locking the bar to the bracket in adjusted position being provided and having operating means such as the handle 38 shown in the drawing.

When a negative is to be mounted on the backing sheet 17 it is first hooked over the pins 32 on one of the bars 30. The bar 30 and its bracket are then adjusted until the negative is located over one of the cutouts. These may be of various sizes to take various size negatives, only two different sizes being shown by way of example. Then the knob 36 and the handle 38 are turned to clamp the bracket 34, 35 to the strap 28 and the bar 30 to the bracket, thereby locking the locating bar to the frame 25. A similar procedure is followed with respect to each of the negatives, the negative locating bars 30 being positioned in each instance on the most conveniently disposed side strap 28 keeping in mind that it is preferable to leave room for an operator to work around the table. In actual practice, all this will be determined beforehand, requiring that some negatives will need holes punched in the top, others in the bottom, and still others in one of the sides. The shoe 31 in each case is beneath the corresponding negative with its pins extending upwardly through the perforations of the negative.

Next, the unperforated ends of each of the negatives is taped to the backing sheet 17 by corner tapes 40. The various negatives are thereby held in centered position, but in order to be satisfactorily fastened to the backing sheet the other corners must be taped down also. In order to accomplish this without disturbing the locked locating bars 30, the operator proceeds as follows. The pins 32 on the locating bar being quite short, the perforated end of the negative may be raised sufficiently to disengage the pins. Then the negative is flexed slightly in the manner indicated in Fig. 5 so as to withdraw its perforated end off the shoe 31, after which that end is permitted to slide beneath the shoe 31 removing the flexed portion. Now the perforated end is taped to the backing sheet by tapes 41 as indicated in Fig. 6. All of the negatives are manipulated in the same manner and their perforated ends taped down. This results in securely fastening all of the negatives to the backing sheet. The frame 25 may then be swung back upon its hinges to the inoperative position illustrated in Fig. 2 without disturbing the negative locating bars 30.

After the bars 30 have thus been raised out of the way, the backing sheet 17 may be lifted off its registering pins 20 and removed from the table. It may then be placed over a sensitized printing plate 45 mounted on register pins 20' in a contact printing frame, only a plate 44 of which is shown in Fig. 8. The registering pins 20' are identical to the pins 20 of the table 24 and receive both the plate 45 and the backing sheet 17. The plate with the negatives positioned over it by the backing sheet is then exposed to light, thereby forming latent positive images on the plate which may be developed in accordance with conventional procedures to constitute a lithographic printing plate. The perforations 46 and 47 in the plate may be used subsequently to accurately register the plate in a printing press, as will be obvious to those skilled in the art.

The lithographic plate for the first color of a multicolor set will now have been completed. The operator may then proceed to mount a second backing sheet provided with perforations 18 and 19 on the pins 20 of the stripping table so as to be registered in precisely the same position as the first backing sheet. The windows 22 and 23 for the second and following sheets are preferably cut at the same time the first backing sheet is prepared so as to be in identical positions with respect to perforations 18 and 19. The frame 25 may then be swung down into operative position so that the locked locating bars 30 are disposed just above the table. The negatives for the second color plate are quickly placed with their perforations over the pins of the various locating bars, after which the free ends of the negatives are taped down. The various negatives are now flexed and slid under the shoes 31 of the bars, and the perforated ends of the negatives taped down. The frame 25 is then again swung up out of the way, the second color backing sheet removed and placed in contact with a second printing plate and the latter photographically printed to produce the second color lithographic printing plate. The same procedure is followed for making any remaining color lithographic plates from the negatives previously prepared for those colors.

It is desired to be understood that while only one example has been given of the way in which the apparatus may be used, numerous other modifications of the invention are possible. For example, only one backing sheet need be prepared with windows 22 and 23, and a dimensionally stable transparent plastic sheet placed over the backing sheet before mounting the negatives. The negatives may be taped to the plastic sheet and both the backing sheet and plastic sheet placed over the printing plate for exposure to light. The plastic sheet may be used for each color and also be useful for later jobs since the sheet is not mutilated as is the backing sheet when windows are cut therein.

Also, whenever negatives are specified, it is to be understood that positives are also intended, depending on the particular process used.

It will be noted that at no time from the punching of the first piece of film 16 to the locating of the final printing plate in registered position on the printing press is visual registration employed, except in approximately locating the first color negatives over the windows of the backing sheet. All registration is accomplished mechanically from camera to press, thus minimizing the possibility of mis-register due to the incident of operator error in visual registration.

The process is thus not only more accurate but can be accomplished in considerably less time by less experienced operators. The present invention provides an extremely versatile system capable of accommodating various types of layouts without requiring expensive changes from one layout to the next.

Having thus described my invention, I claim:

1. A stripping table for visually locating and securing a first film piece on a backing sheet in a desired position and for positively locating and securing subsequent corresponding film pieces in identical positions on additional backing sheets, said table having a top surface for receiving the backing sheets one at a time, cooperating pin and hole registering means on said table and each of said backing sheets for registering each sheet in turn to said table, a rigid frame member removably mounted on the table, cooperating registering means on said table and said frame member for registering the frame member in a preselected position on the table, film carrying means adjustably supported on the frame member, said film carrying means including a thin, flat plate adapted to closely lie over a backing sheet when the frame member is in registered position on the table and also including locating pins projecting upwardly from said plate, said pins being adapted to register the film pieces to said film

carrying member by means of holes in each film piece corresponding to the pins on said plate, the holes in each film piece being in identical positions with respect to the subject thereon, and means for releasably locking the film carrying means to said frame member.

2. A stripping table according to claim 1 wherein the registering means on the table cooperating with the backing sheets also serves to register the frame member to the table.

3. A stripping table according to claim 1 wherein a plurality of film carrying members are provided, said carrying members being adapted to be located in various positions about the frame member.

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