Dec. 27, 1949 W. C. HUEBNER 2,492,528

METHOD AND MEANS FOR REGISTERING PRINTS FROM PRINTING ELEMENTS

Filed Sept. 27, 1944 2 Sheets-Sheet 1

Fig. 1.

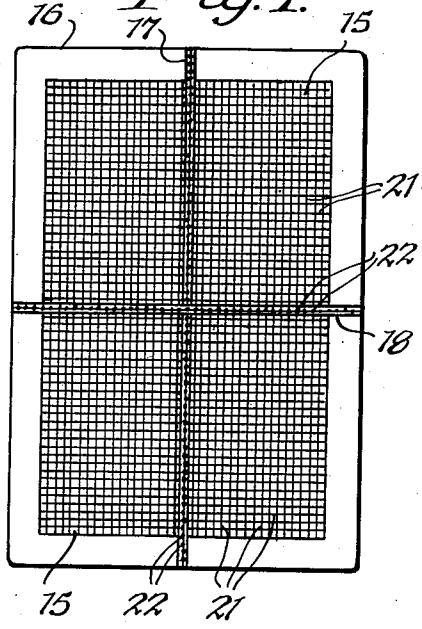
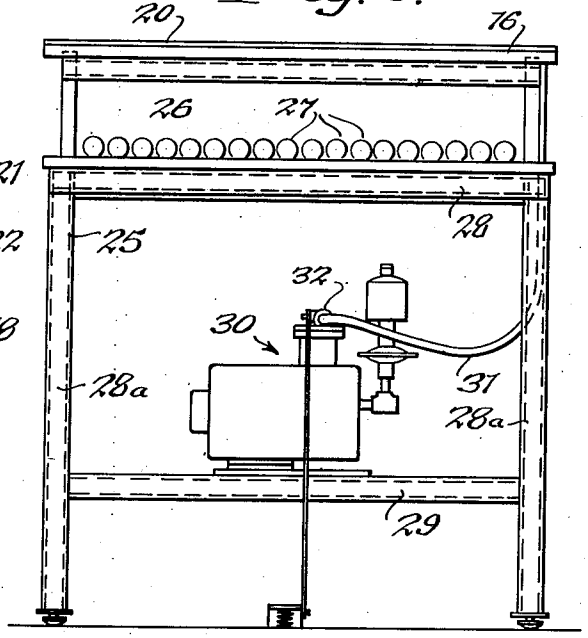
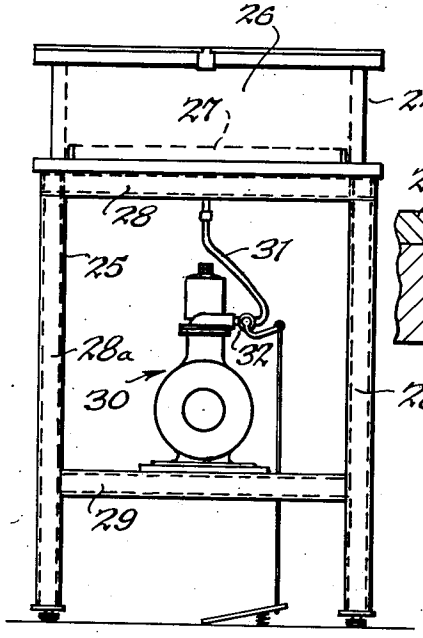


Fig. 3.





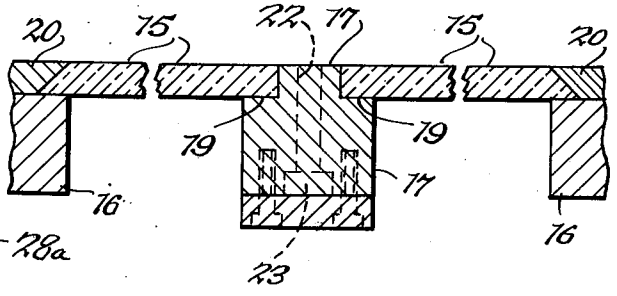


Fig. 4.

Fig. 2.

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METHOD AND MEANS FOR REGISTERING PRINTS FROM PRINTING ELEMENTS

Filed Sept. 27, 1944 2 Sheets-Sheet 2

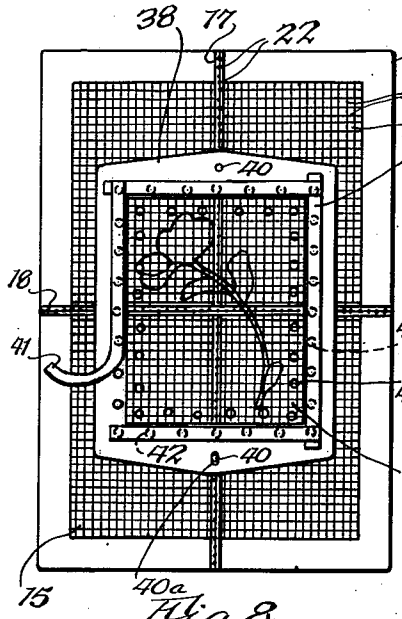


Fig. 8.

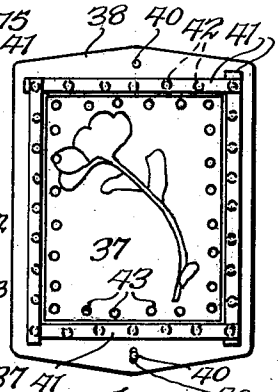


Fig. 9.

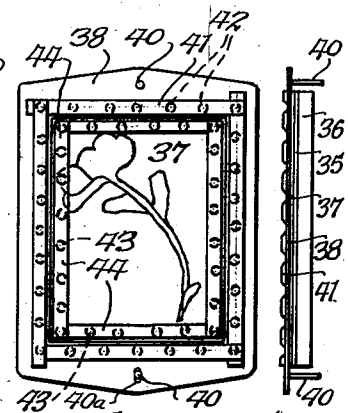


Fig. 10.

Fig. 10B.



Fig. 9A.



Fig. 10A.

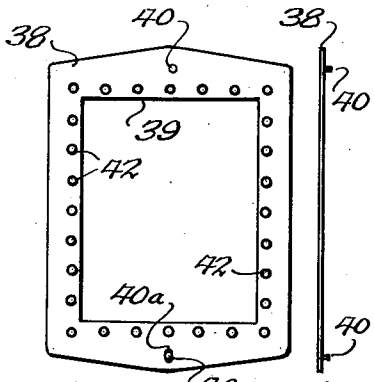


Fig. 5.

Fig. 5B.

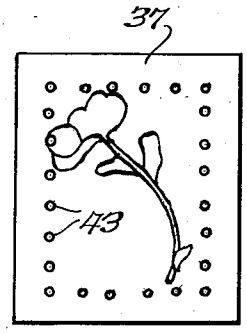


Fig. 7.

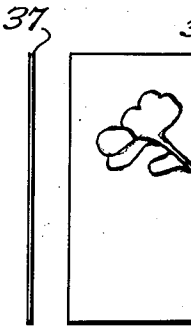


Fig. 7B.

Fig. 6.



Fig. 6B.

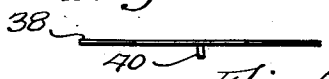


Fig. 5A.



Fig. 7A.

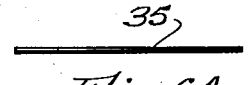


Fig. 6A.

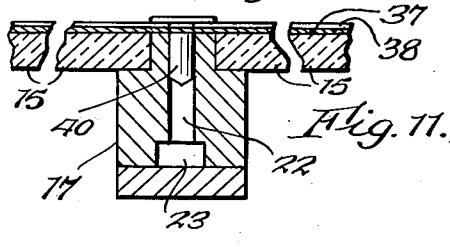


Fig. 11.

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Patented Dec. 27, 1949

2,492,528

UNITED STATES PATENT OFFICE

2,492,528

METHOD AND MEANS FOR REGISTERING PRINTS FROM PRINTING ELEMENTS

William C. Huebner, New York, N. Y.

Application September 27, 1944, Serial No. 555,929

9 Claims. (Cl. 33—184.5)

1

This invention relates to a method and means for accurately predetermining the positions of prints made from printing elements, as for effecting registration of the impressions from a set of coordinated printing plates or elements, such for instance, as printing plates having the component images of a multi-color set for producing multi-color prints, and which plates have to be registered, or predetermined as to position, in order that prints made from their several images will register or coincide precisely one with the other in the finished multi-colored print.

In multi-color letterpress printing as practiced today in printing newspapers or magazines for example, the advertisers' color copies or plates are usually produced in photo-engraving shops and sold directly to the customer, and the original plates are sent by the customer to the printer for use in printing the newspaper or magazine pages, or for other advertising purposes. As is generally known, photoengravers' plates do not carry register marks or means whereby the printer can obtain quick register of the successive plates of a multi-color set with the first impression, and it is only by trial and error that exact registration is obtained and, as is recognized by those skilled in the art, this is a time-consuming, wasteful and expensive procedure. It is a purpose of this invention to provide a method and means whereby such labor and loss of time can be obviated and the printings of the images from successive color-plates of a set can be readily made to accurately register one with the other on the printed sheet or page, and whereby also the images can be positioned accurately in predetermined, required relation to register indicia, such as vertical and horizontal register lines crossing each other at the center of the image, or with relation to the rectangularly disposed marginal lines of the sheet or the work area in which the images appear on the final printed form.

Another purpose of the invention is to provide a method and means for holding printing elements from which impressions are to be made, in exact predetermined relation to registering means, whereby a set of color printing plates or elements can be accurately located and held in true, registered relation one with the other, so that correspondingly positioned registering indicia, as central cross lines, can be scribed on the surface or margins of each printing plate or element, or rectangularly disposed marginal lines can be scribed or cut along the outer margins of the plates or elements for guides for trimming the plates or elements to exact rectangular form.

2

Either the central cross lines or the rectangularly related marginal lines can be used for registration of the images, since they would have direct, predetermined register relation one with the other.

Other objects of the invention are to provide a practical, novel method and means enabling the accomplishment of such results; also to provide a registering support table or surface and cooperating means for registering the printing elements with films printed therefrom in predetermined registered relation with each other and with a portable holder for the film and/or printing element, and which registering support is also equipped with means, such for example, as vacuum means, for releasably holding the printed film and printing element from shifting out of registered position while attaching the film or printing element in the registered position to said holder.

Further objects and advantages of the invention will appear from the following specification of the preferred embodiment of the invention shown in the accompanying drawings, and the novel features of the invention are set forth in the appended claims.

In said drawings:

Fig. 1 is a plan view of a stand or table provided with a registering top or surface and constituting part of registering means embodying my invention.

Fig. 2 is an end elevation thereof.

Fig. 3 is a side elevation thereof.

Fig. 4 is a fragmentary, transverse, sectional elevation, on a larger scale, of the registering top.

Fig. 5 is a plan or face view of the portable or coordinator holder for the printing element and printed film.

Fig. 5A is an end edge elevation thereof.

Fig. 5B is a side, edge elevation thereof.

Fig. 6 is a face view of the printing plate or element.

Fig. 6A is an end edge elevation thereof.

Fig. 6B is a side edge elevation thereof showing the printing plate mounted on the orthodox wooden block to which the printing plate may be attached for holding the printing surface of the plate type high in an ordinary typographic chase.

Fig. 7 is a face view of a transparent film with an image printed thereon from the printing plate.

Figs. 7A and 7B are respectively an end and a side edge elevation of the printed film.

Fig. 8 is a plan view of the registering table top or surface with the printed film in registered posi-

tion thereon and attached to the film holder, which is held in predetermined position on the table top and attached to the printed film.

Fig. 9 is a face view of the film holder with the printed film attached thereto, removed from the registering table or surface.

Fig. 9A is a longitudinal, sectional elevation thereof.

Fig. 10 is a view similar to Fig. 9, showing both the printing plate and the printed film taped or attached to the film holder.

Fig. 10A is an end edge elevation thereof.

Fig. 10B is a longitudinal, sectional elevation of the same parts but showing the printing plate mounted on a wooden block.

Fig. 11 is an enlarged, fragmentary, sectional elevation of the registering table top showing the printed film and film holder in place thereon with one of the dowels of the holder in one of the registering holes of the table top.

In the embodiment of the invention illustrated in the drawings, the registering device comprises a suitable table having a horizontal top, preferably formed by plates 15 of glass or other suitable transparent material set in an open, rectangular top frame 16 which, as shown, has vertical and horizontal, or longitudinal and transverse cross bars 17 and 18 disposed perpendicularly to each other accurately on the longitudinal and transverse center lines of the top. These transparent top plates 15 cover the four rectangular spaces or openings formed between the cross bars 17 and 18 and the marginal bars of the frame 16, being supported at their inner edges in rabbets 19 in the cross bars and held in place by bevelled retaining members 20 secured along the margins of the frame 16 against the bevelled edges of the glass plates. The top surfaces of the glass plates, the cross bars and retaining members are flush with each other so as to provide a flat or plane supporting and registering surface for the printing plates and films. The top faces of the top plates 15 are preferably scribed with uniformly spaced, fine, longitudinal and transverse registering grid lines 21 respectively parallel with the longitudinal and transverse center lines of the top, and the cross bars 17 and 18 are each preferably provided with spaced, vertical dowel holes 22 which are open at their upper ends and communicate with air passages 23 extending lengthwise in the cross bars. These dowel holes, which are uniformly spaced as, for instance, one-half inch apart, and preferably are consecutively numbered outwardly from the center or intersection of cross bars and alined centrally with the cross grid lines 21 of the top plates, are for the purpose of receiving dowel pins projecting from a portable coordinator film holder 38 presently described, for locating it in centered position over the registering top surface, and in cooperation with the communicating passages 23 of the cross bars, they serve for the exhaustion of air for holding the film or printing plate by suction or vacuum on the registering surface.

As shown, the table top surmounts a box-like frame 24 which, in turn, by preference, is stationarily but removably mounted on a supporting stand 25 and forms beneath the table a light chamber 26 which may be illuminated, as by light tubes or lamps 27, suitably mounted in brackets or sockets in the lower portion of the chamber 26. One side of the light chamber may be hinged or removable to afford access to the

light bulbs, for removing or replacing them, and suitable diffusing means may be provided in the light chamber for evenly distributing the light to uniformly illuminate the whole area of the transparent table top. The supporting stand 25 may be of any suitable construction. As shown, it comprises a horizontal, rectangular top frame 28 in which the box frame of the table top is removably seated and to which are rigidly secured upright corner posts or legs 28a rigidly connected at their lower portions by horizontal cross braces 29 which form a support for a vacuum pump and operating motor unit represented conventionally at 30. The vacuum pump is suitably connected by a suction pipe or tube 31 with the air passage 23 of one of the cross bars 17—18 of the table top. These air passages communicate with each other at their intersection and are closed at their outer ends so that by means of the pump or other suction means, air may be exhausted from the passages and dowel holes 22 to thereby create a vacuum or suction between the top surface of the table and a film or printing plate lying thereon over the holes, whereby the plate or film will be held firmly on the surface against shifting out of the position to which it has been adjusted on the surface. In the event that the film or plate being used is not of sufficient area to cover all of the dowel holes 22, those holes, which are left uncovered beyond the edges of the film or plate, can be closed, as by applying adhesive tape over them, to thereby prevent the entrance of air through them interfering with the proper holding suction on the film or plate. The pump suction may be controlled for thus holding and releasing the film or plate in any convenient manner, such as by means of a treadle-actuated valve 32 in the suction pipe, or by starting and stopping the pump motor by means of a suitable control switch or device.

In Fig. 6 is shown a printing plate or element 35, which may be one of a set of multi-color printing plates, the printed images from which are to be registered. This element may be a copper plate having the image or copy etched thereon, or it may be a printing plate or element of any suitable character from which prints can be made and, when necessary, it may be mounted on the orthodox wooden block 36, as shown in Fig. 6B, for supporting the plate type-high in the ordinary printers' chase. A print or impression of the image of the printing plate or element is made from the printing plate on a transparent film 37, the printed film being shown in Fig. 7.

38, Figs. 5, 5A and 5B, represents a portable or coordinator film holder for the printed film 37. This holder is preferably in the form of a thin plate or sheet of metal or other suitable material having a central opening 39 large enough for the image on the printed film to be exposed through the opening when the film holder is placed on the upper face of the printed film, and the film holder is preferably provided on its longitudinal center line, at its opposite ends, with two dowel pins 40 which project from the rear or underface of the holder. These dowel pins are so positioned or spaced that when the holder is placed over the table top or registering surface, with the pins inserted in two dowel holes 22 of the longitudinal cross bar 17, which are spaced equally at opposite sides of the transverse center line of the top, the film holder will be located in a predetermined centered and squared position over the top or

registering surface. Since the dowel pins have a close sliding fit in the dowel holes, they will locate the film holder with great accuracy. The holders are made of different sizes appropriate for use with films of different dimensions, and the dowel pins of each holder are so located thereon that when inserted in the appropriate dowel holes of the registering surface, the film holder, whatever its size, will be accurately centered and alined longitudinally and transversely with reference to the registering surface. The before mentioned numbering or identification of the different dowel holes 22 facilitates the ready centering of different sized film holders on the registering surface. Preferably one of the dowels 40 is fixed but the other is permitted slight longitudinal movement, as in a slot 40a in the holder. This enables easier insertion of the dowels in the dowel holes 22, and since there is no side movement, the registration is exact with the holder flat or straight.

In the use of the registering device, a print of the image of a printing plate 35 is made on a transparent film 37, Fig. 7. This film is then laid on the registering table top or surface and shifted as may be necessary with reference to the registering grid lines 21 of the registering surface to position the image of the film in approximately the required centered and alined position with regard to the margin or work area of the page to be printed, and when the film has been thus centered or registered, the vacuum control device is operated to cause suction through the dowel holes beneath the printed film to thereby firmly hold the film down flat on the registering surface against shifting out of its registered position. A film holder 38 is then placed on the upper face of the registered film, as shown in Fig. 8, with its dowel pins 40 engaged in the appropriate dowel holes 22 to center or register the holder relatively to the registering surface, as before explained. The holder is then attached or caused to adhere to the film as, for instance, by applying strips 41 of adhesive tape, drafting tape or the like, on the film holder over holes 42 passing through the film holder around its central opening, and pressing the tape through the holes 42 into contact with the face of the underlying printed film, the film thus being attached in its registered position to the registered or centered holder, as represented in Figs. 8 and 9. Then the vacuum or suction is broken to release the printed film from the registering surface and the film holder 38 with attached film is removed or lifted off of the registering surface, and the printing plate placed on the registering surface under the film and shifted, as may be necessary, to cause the image of the printing plate to register or coincide with the printed image on the film 37. The printing plate can be thus shifted beneath the printed film, as necessary, for registering the images of the plate and film in any suitable manner, as for instance, by means of pointed implements passed through holes 43 in the film. The vacuum control is then again operated to create suction on the printing plate for holding it from shifting out of its registered position on the registering surface.

While thus held in position on the registering surface, the printed film, affixed in the registered position on the film holder, may be pressed against the face of the printing plate and affixed thereto, as by applying strips 44 of adhesive tape

or the like on the printing film 37, and pressing the tape down through the holes 43 in the film into adhering contact with the face of the printing plate. Both the printing plate and printed film will then be attached in like, predetermined positions, to the film holder, and the latter can be removed by withdrawing its dowel pins from the dowel holes of the registering surface, and the holder with the attached printing plate and film transferred to a scribing table or device having dowel holes therein located correspondingly to the dowel holes 23 of the registering surface, and preferably similarly connected to suction or vacuum-creating means. By engaging the dowels of the film holder in the corresponding dowel holes of the scribing table, the printing plate will be located in precisely the same position relatively to the scribing table in which it was registered on the registering surface 15, and by operating the suction control of the scribing device, the printing plate can be held firmly in place on the scribing table. Then the tapes 44 can be removed to free the film from the printing plate, and the holder 38 with the printing film removed from over the scribing table, leaving the printing plate held in the predetermined registered position on the scribing table. While the printing plate is held thus in the predetermined position, the scribing instruments of the scribing device can be actuated to scribe register lines or marks on the printing plate.

In like manner, each of the color printing plates of the multi-color set can be registered with the printed film 37, or with a film printed from any of the different color plates, and register lines or marks scribed on the plate. Thus, since the scribing instruments are correlated with the scribing table so as to make the scribed lines or marks always in the same positional relation to the scribing table, the register marks or lines can be scribed in exactly corresponding positions or relations on the several color plates of the set to serve as accurate guides for registering the plates in the press for making successive impressions from the several plates in exact coincidence or register, one with the other on the final printed sheet or page.

Instead of transferring the film holder with the attached registered printing plate and printed film to a separate scribing table, in the manner just described, the printing plate 35, after being registered in the predetermined position on the registering surface 15, as before explained, can be retained in place on the registering surface by continuing the suction or vacuum. While the printing plate, film and holder are so assembled, the film can be cut through, using the inner edges of the film holder as a guide, and by means of a scriber corner marks can be scribed in the printing element while it is held firmly in registered position on the registering surface. Additional registering lines or marks can then be scribed in predetermined positions on the printing plate in predetermined relation to the registering surface, as for instance, in coincidence with the center lines of the longitudinal and transverse cross bars 17 and 18, by suitable scribing means. Registering marks or lines similarly scribed on the other color plates of the multi-color set would occupy precisely corresponding positions on the several plates and serve as registration guides for properly registering the plates in the printing press.

I claim as my invention:

1. A registering device of the character described comprising a registering surface forming a support for a printed film placeable face to face thereon and having fixed portions cooperable with said film to locate the film in a definite registered position on said surface, said surface having spaced dowel holes arranged in the longitudinal central line of said surface in a plurality of differently spaced pairs with the holes of each pair equidistant from the central transverse line of said surface, a movable holder for said film placeable face to face upon said positioned film and exposing to view therethrough the film image, a pair of dowels projecting from said holder in its longitudinal central line equidistant from the center of the holder and engageable in one or another pair of said dowel holes depending upon the size of said holder for removably holding said holder in a predetermined centered relation to said registering surface, suction means for exhausting air from beneath said film through said dowel holes for releasably securing said film in said registered position on said surface, means for attaching said holder in said centered relation face to face to said film while retaining the latter in said registered position, said holder being movable to lift the attached film off of said registering surface after first releasing said film from said surface to enable a printing element having an image corresponding with the image of said nim to be placed between said film on said holder and said registering surface with its image registered with that of said film.

2. The hereindescribed method of accurately predetermining the position of prints from the image of a printing element comprising the following steps: making a print from said element on a transparent film, placing and adjusting said print film in a definite registered position on a registering support which is provided with registering indicia cooperating with said printed film for locating the film in said registered position thereon, releasably securing the film on said support in said registered position while manually retaining the film in said registered position, placing a film holder over said film in a definite position relative to said registering support predetermined by cooperating parts on said support and holder, said holder exposing therethrough the image of said film, attaching said film to the under face of said holder while the holder is retained in said predetermined position and said film remains secured on said support, and then releasing said film from the registering support leaving it attached to said holder, placing said printing element on the registering support beneath said transparent printed film and registering the image of the printing element with that of the film while the film is retained by said holder in its registered relation to said registering support, securing said printing element to said support in its said registered position, and then making registering indicia on said printing element in predetermined positions relative to said support while the printing element is retained on said support in said registered position.

3. The herein described method of accurately predetermining the position of prints from the image of a printing element of undetermined dimensions and having no registering indicia thereon, comprising the following steps: printing on a transparent film an image corresponding with the image on the printing element, placing and adjusting said film in a definite registered position on a registering support having relatively fixed registering indicia that cooperate with the image on the film to locate the film in said registered position, releasably securing said film in said registered position on said support while retaining the film in said registered position, placing a movable film holder over said film in a particular relation to said registering support predetermined by cooperating parts on said support and said holder, said holder exposing therethrough the image of said film, attaching said film to the under face of said holder while the holder is retained in said predetermined position and said film remains secured on said support, then releasing said film from the registering support leaving it attached to said holder, placing said printing element on the registering support beneath said transparent printed film and registering the image of the printing element with that of the film while the film is retained by said holder in its registered relation to said registering support, securing said printing element to said support in its said registered position, and then making registering indicia on said printing element in predetermined positions relative to said support while the printing element is retained on said support in said registered position.

4. The hereindescribed method of effecting accurate registration of prints from the images of a coordinated set of different printing elements comprising the following steps: making a print from one of said elements on a transparent film, placing and adjusting said printed film in a definite registered position on a registering support which is provided with registering indicia cooperating with said printed film for locating the film in said registered position, releasably securing the film on said support in said registered position while manually retaining the film in said registered position, placing a movable film holder over said film in a particular position relative to said registering support predetermined by cooperating parts on said support and holder, said holder exposing therethrough the image of said film, attaching said registered film to the under face of said holder while the holder is retained in said predetermined position and said film remains secured on said support and without disturbing said holder or film, releasing said film from said registering support, placing each of said printing elements in succession on the registering support beneath said transparent printed film and registering the image of the printing element with that of the printed film while the film is retained by said holder in its registered relation to said registering support, releasably securing the printing element to said support in its said registered position, and then making registering indicia on each of said printing elements in like predetermined positions relative to said support while the printing element is retained on said support in said registered position.

5. The hereindescribed method of effecting accurate registration of prints from the images of a coordinated set of different printing elements comprising the following steps: making a print from one of said elements on a transparent film, placing said printed film in a definite registered position on a registering support having means cooperating with the film for locating the film thereon in said registered position, exhausting the air from between said film and the support for re-

leasably securing the film in said registered position on said registering support, placing a film holder on the face of said film in a definite position relative to said registering support predetermined by cooperating parts on said support and holder, said holder exposing therethrough the image of said film, causing said printed film to releasably adhere to the under face of said holder while the holder and said film are retained in said predetermined positions, interrupting the exhaustion of the air to release said film from said registering support, placing said printing elements in succession between said film and said registering support and registering the image of each printing element with that of the film while the film is retained by said holder in its said registered relation on said registering support, and then making registering indicia on said printing element in predetermined positions relative to said support while the printing element is retained on said support in said registered position.

6. The hereindescribed method of effecting accurate registration of prints from the images of a coordinated set of different color printing elements comprising the following steps: making a print from one of said elements on a transparent film, placing and adjusting said printed film in a definite registered position on a registering support provided with means cooperating with the image of the film for locating the film thereon in said registered position, releasably securing said film on said support in said registered position, placing a film holder over said film in a definite position relative to said registering support predetermined by cooperating parts on said support and holder, said holder exposing therethrough the printed image of said film, attaching said registered film to the under face of said holder while the holder and said film are retained in said predetermined positions, releasing said film from said registering support, placing said printing elements in succession on the registering support beneath said film and registering the image of each printing element with that of the printed film while the film is retained by said holder in its registered relation to said registering support, releasably securing the printing element in said registered position on said registering support, attaching said registered printing element to the under face of said film on said film holder while the printing element is still secured in place on the registering support, then releasing the printing element from said support, and removing and placing said holder with the attached registered printing element in corresponding predetermined position in a device having means arranged to make registering indicia in corresponding predetermined positions on each printing element while it is retained in said registered position in said device.

7. In a registering device of the character described, the combination of a table top comprising longitudinally channeled cross bars located on the longitudinal and transverse central lines of said top, and transparent plates cooperating with said cross bars to form a substantially continuous plane registering surface for a transparent printed film placeable face to face on said surface, said transparent plates having uniformly spaced cross grid lines respectively parallel with said cross bars cooperable with the printed image of said film for locating said film in a definite registered position on said surface, uniformly spaced dowel holes in at least one of said cross bars disposed in a plurality of differently spaced pairs with the holes of each pair equidistant from the intersection of said cross bars, suction means communicating through said bar channels with said dowel holes for releasably retaining said film in said registered position on said registering surface, a movable holder for said film placeable face to face upon the upper face of said registered film, said holder exposing therethrough the image of said film, and having dowels projecting therefrom on a central line of said holder equidistant from the center of the holder and engageable in one or another pair of said dowel holes depending upon the side of said holder for holding said holder in a predetermined centered relation to said registering surface, means appliable from above said holder for attaching said holder while retained in said centered relation to said film while the latter is retained in its said registered position on said registering surface, said holder being movable to lift the attached film off of said registering surface after releasing the film from said surface to enable a printing element having an image correlated with the image of said film to be placed between said film on said holder and said surface with its image registered with that of said film.

8. In a registering device of the character described, a table top comprising longitudinally channelled cross bars located on the longitudinal and transverse central lines of said top, and transparent plates cooperating with said cross bars to form a substantially continuous plane registering surface for a transparent printed film placeable face to face on said surface, said transparent plates having uniformly spaced cross grid lines respectively parallel with said cross bars cooperable with the printed image of said film for locating said film in a definite registered position on said surface, uniformly spaced dowel holes in at least one of said cross bars disposed in a plurality of differently spaced pairs with the holes of each pair equidistant from the intersection of said cross bars, said dowel holes and a connecting bar channel enabling the exhaustion of air from beneath said film for releasably securing said film in said registered position on said registering surface, a movable holder for said film being placeable face to face upon the upper face of said registered film, said holder exposing throughout the image of said film, and having dowels projecting therefrom on a central line of the holder equidistant from the center of the holder and engageable in one or another pair of said dowel holes depending upon the size of said holder for holding said holder in a predetermined centered relation to said registering surface, said holder being attachable in its said centered position to the upper face of said film while the latter remains secured on said registering surface, and said holder being movable to lift the attached film off of said registering surface after releasing the film from said surface to enable a printing element to be placed beneath said film on said registering surface for registering the image of the printing element with that of said film.

9. In a registering device for the purpose described, a registering surface forming a support for a printed film placeable face to face thereon and having fixed portions cooperable with the printed image of said film to locate the film in a definite registered position on said surface, said surface having spaced dowel holes arranged in a longitudinal central line of said surface in a plurality of differently spaced pairs with the

holes of each pair equidistant from and at opposite sides of the center of said surface, a movable holder for said film being placeable face to face upon said registered film and exposing therethrough the film image and having a pair of dowels projecting from said holder in its longitudinal central line equidistant from the center of the holder and engageable in one or another pair of said dowel holes, depending upon the size of said holder, for holding the holder in a predetermined centered relation to said registering surface, said dowel holes enabling the exhaustion of air from beneath said film for releasably securing the film in said registered position on said surface, said holder being attachable to said film while retaining the latter in said registered position, and said holder being movable to lift the attached film off of said registering surface after releasing the film from said surface to enable a printing element having an image correlated with the image of said film to be placed between said film and said registering

surface with its image registered with that of said film.

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