

July 7, 1936.

G. A. FRIESS

2,046,508

REGISTERING DEVICE AND METHOD FOR USE IN MULTICOLOR PRINTING

Filed Aug. 6, 1935

3 Sheets-Sheet 1

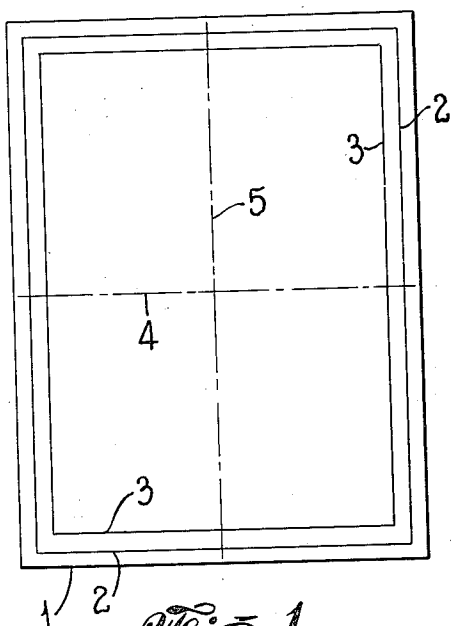


Fig. 1.

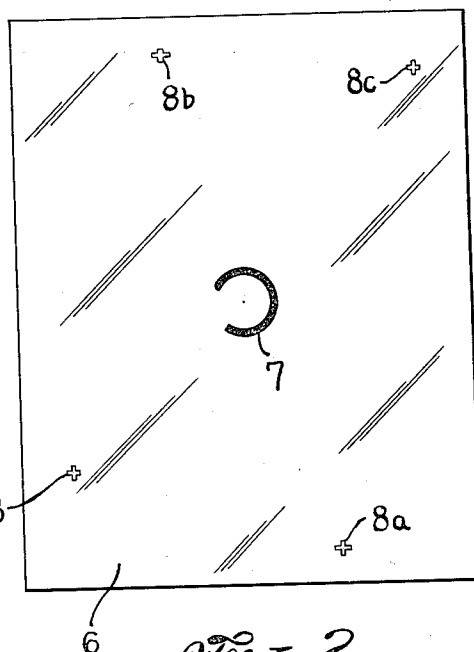


Fig. 2.

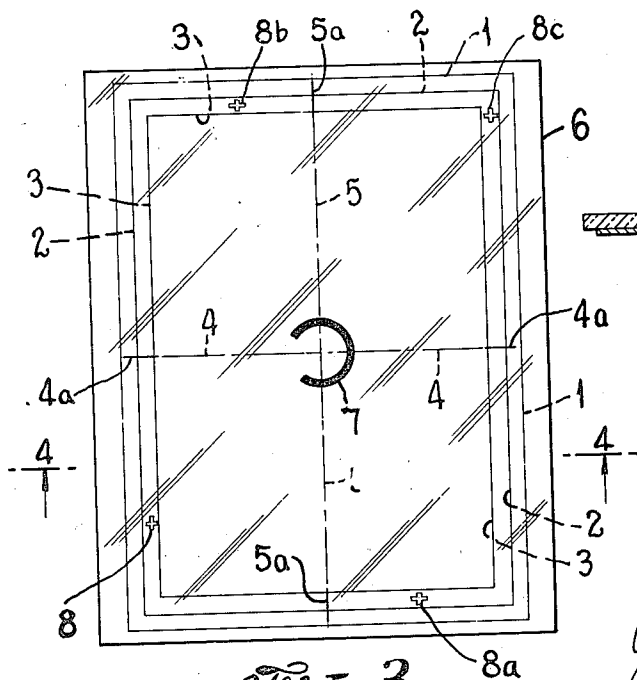


Fig. 3.

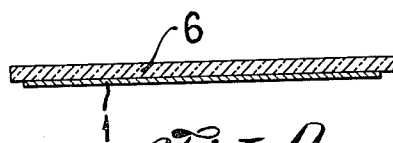


Fig. 4.

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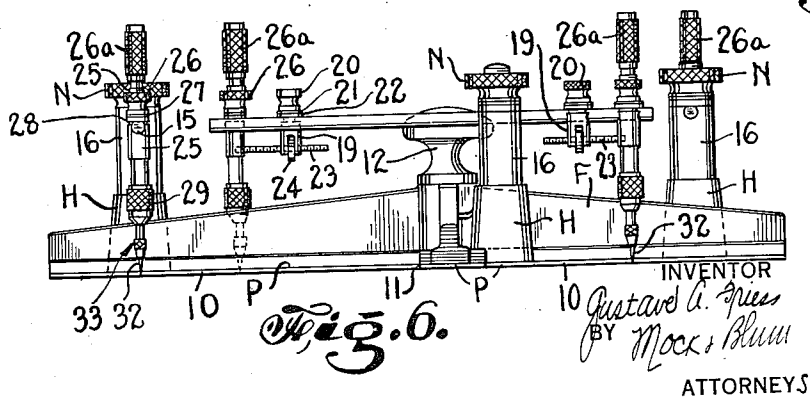
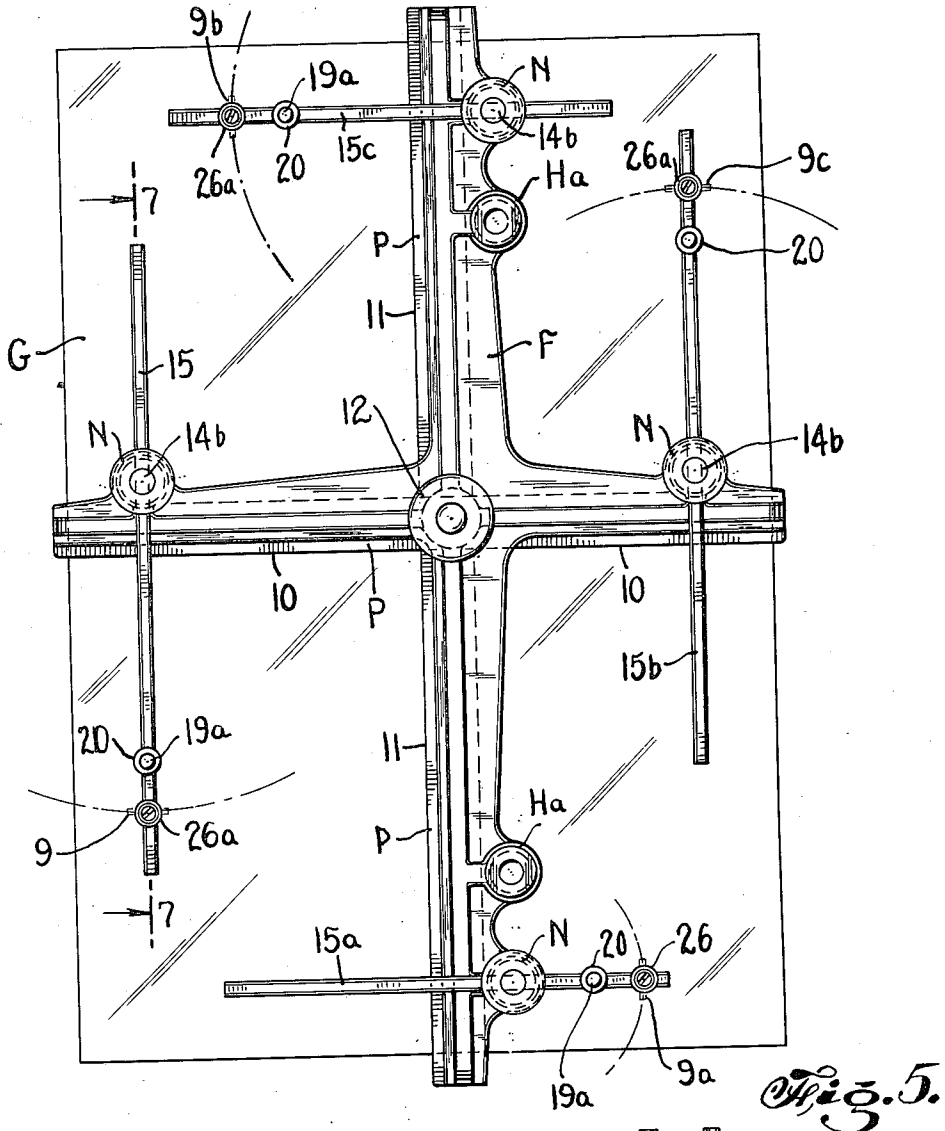
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3 Sheets-Sheet 2



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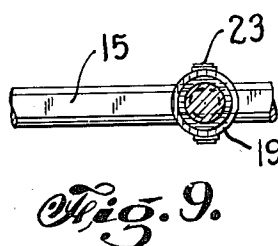
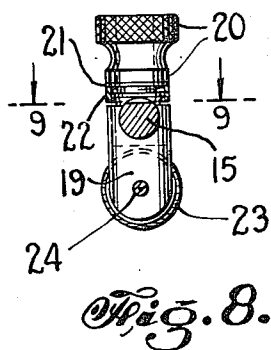
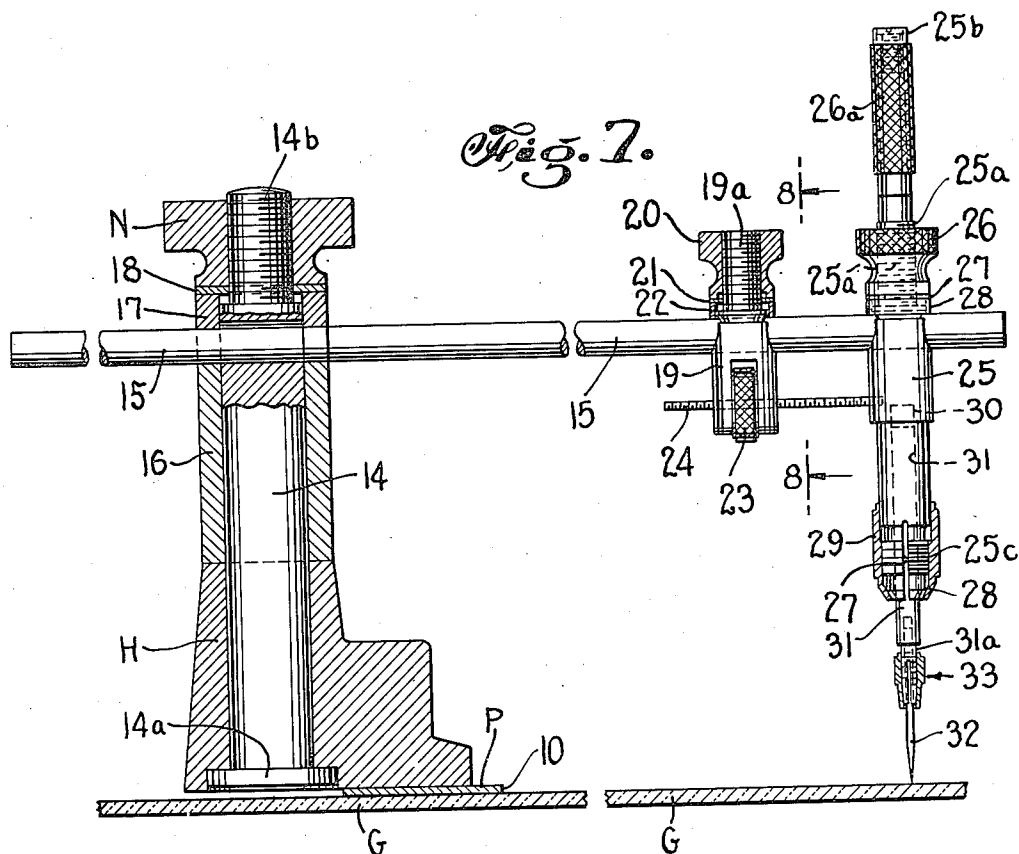
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REGISTERING DEVICE AND METHOD FOR USE IN MULTICOLOR PRINTING

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3 Sheets-Sheet 3



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REGISTERING DEVICE AND METHOD FOR
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Application August 6, 1935, Serial No. 34,869

4 Claims. (Cl. 33—32)

My invention relates to a new and improved registering device and method, for use in multi-color printing.

One of the objects of my invention is to provide a new and improved scribing tool guide, which can be used for making the correct cylinder locating marks on each separation print or positive, so that these marks can be correctly located or registered on the individual printing cylinders.

Another object of my invention is to provide means for locating the centre lines on each page which is to be printed.

Another object of my invention is to provide a very simple and efficient method and tool or device, for this purpose.

Other objects of my invention will be set forth in the following description and drawings which illustrate a preferred embodiment thereof, it being understood that the above statements of the objects of my invention are intended to generally explain the same without limiting it in any manner.

Fig. 1 is a top plan view of a sheet of paper or metal or the like, which is provided with registration lines. This sheet may be designated as a "master" sheet, and it serves the purpose of a reference standard, and it is used to locate the illustration, etc., properly on the page in the final printed result.

Fig. 2 is a top plan view of a sheet of separation negative made on transparent material, such as glass or celluloid or the like. This separation negative of the pictorial representation, corresponds to one of the colors of the multi-color matter which is to be printed. Fig. 2 illustrates the separation negative of an entire page which is to be printed.

Fig. 3 is a top plan view, showing how the light-permeable separation negative which is shown in Fig. 2, has been placed over the sheet of paper which is shown in Fig. 1.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a top plan view, showing the improved tool, located on top of a sheet of glass or other transparent or suitable material, which corresponds to another separation print.

Fig. 6 is an elevation of the tool shown in Fig. 5, taken at the bottom edge of Fig. 5.

Fig. 7 is a sectional view on the line 7—7 of Fig. 5.

Fig. 8 is a sectional view on the line 8—8 of Fig. 7.

Fig. 9 is a sectional view on the line 9—9 of Fig. 8.

In multi-color printing, and in particular in multi-color gravure printing, it is customary to place various register marks on the original color copy. These register marks are photographed in making the separation negatives and positives of the copy, each said separation corresponding to one of the primary colors. In gravure printing, it is customary to use carbon tissues in the process of etching the printing cylinder. The register marks which are available are those which indicate the page locations and the like, and it is necessary to have the register marks in correct and identical location relative to each other, on each of the successive printing cylinders, each of which prints a separate color.

In actual practice, it is customary to take four separation negatives of the copy, one separation corresponding to the black tone or color of the original copy, the other negatives being separations which correspond to the respective primary colors.

Referring to Fig. 1, this shows a master sheet of paper or metal 1, which corresponds in size and shape to the sheet of paper which is to be printed upon. Said sheet of paper is provided with margin lines 2 and 3. The area of the sheet 1 which is defined by the margin line 2, corresponds to the sheet of paper which is to be printed upon. The margin line 3 defines the area of the printed matter upon said sheet. For example, if the printing is to be done upon a newspaper, the size of the newspaper sheet is defined by the margin line 2.

Said master sheet 1 is provided with centre lines 4 and 5, which are perpendicular to each other.

Fig. 2 represents a sheet of glass or celluloid or other suitable light-permeable material 6, which carries a pictorial representation 7, said pictorial representation 7 being a negative separation which corresponds to one of the primary colors. Said light-permeable member 6 is provided with any suitable number of registration marks, which may be arranged in any suitable manner. For purposes of illustration, I have shown four registration marks 8, 8a, 8b, and 8c. These registration marks are photographic reproductions of registration marks which have been located upon the original copy, prior to taking the separation negatives thereof.

Hence the registration marks upon the light-permeable sheet 6 result from the photographic printing, when the separation is made.

As shown in Figs. 3 and 4, the negative transparency 6 is now placed over the master sheet with the registration marks 8, 8a, 8b, 8c, located in

the space between the margin lines 2 and 3, or in any other position, dependent upon the location of the separation negative on sheet 6.

Marks 4a and 5a are now made upon the back of transparency 6. These marks 4a and 5a are straight lines, which overlie the original lines 4 and 5, of the sheet of paper 1. These marks 4a and 5a may be located in any part of the separation member 6, depending upon the location of the negative in said member 6.

The tool which is used for securing the registration, consists substantially of a frame member F, made of any suitable metal. Said frame F is provided with two straight edges 10 and 11, which are perpendicular to each other. As shown in Fig. 7, said straight edges can be provided by means of separate plates P, which can be connected in any suitable manner to the underside of the frame F.

The frame F is provided with a suitable number of hubs H. In this embodiment I have shown four of said hubs, each of said hubs corresponding to one of the registration marks.

The general construction of the hubs and appurtenant parts is identical, and such general construction is illustrated in Fig. 7.

Fig. 7 shows a sleeve 16, which abuts the top of the hub H.

A stud 14 is located in each hub H and in the associated sleeve 16. Each said stud 14 is provided with an enlarged head 14a. Likewise, the top of each stud 14 is provided with an externally threaded extension 14b, whose diameter is less than the diameter of the stud 14.

A slide rod 15, having a flat and planar top face, fits slidably in suitable aligned bores which are provided in the sleeve 16 and in the stud 14.

The sleeve 16 and the stud 14 are turnable on the hub H, so that each slide rod 15 can be given a turning movement as well as a sliding movement. This turning movement is graphically represented by the arcs, in Fig. 5.

Each slide rod 15 can be clamped in adjusted position relative to its sleeve 16 and its stud 14.

A collar 17 has a planar annular surface, which abuts the top planar surface of the rod 15, as shown in Fig. 8.

A washer 18, made of a suitable compressible and resilient material, is located on top of the clamping collar 17. A nut N can be screwed down upon the threaded extension 14b, so as to compress the washer 18, and to clamp the rod 15 between the sleeve 16 and the collar 17. When the rod 15 is thus clamped, the cylindrical portion thereof is forced against the correspondingly shaped parts of the bores in the sleeve 16 and stud 14.

Slides 19 and 25 are mounted upon the rod 15. The rod 15 passes through a bore in the slide 19, and said slide 19 is provided with an externally threaded extension 19a. The slide 19 is adjustably clamped in position upon the rod 15, by means of a clamping collar 22, a washer 21, and a nut 20. This part of the construction is generally the same as that shown at the upper left-hand side of Fig. 7.

A knurled and internally threaded wheel 23 is turnably mounted in the slide 19, and the turning of said member 23 moves a screw 24 back and forth. The right hand side of the screw 24 is connected to the slide 25. This provides a fine adjustment for the slide 25.

The slide rod 15 passes through a bore in the slide 25, and said slide 25 is provided with an externally threaded extension 25a. The slide 25 is

adjustably clamped in position, by means of a clamping collar 28, a washer 27, and nut 26. The slide 25 has an unthreaded extension 25b which extends above nut 26, and extension 25b has a knurled sleeve 26a which may be turnable or fixed relative to 25b.

The lower part of the slide 25 is provided with a bore 30. Likewise the lower end portion of the slide 25 is provided with an external thread 25c and said slide 25 is provided with a tapered bottom end 28, which has a frusto-conical shape. The bottom of the slide 25 is provided with a suitable number of vertical slots 27, so that said bottom portion of the slide 25 is resilient and compressible. A shank 31 is located in the bore 30 of the slide 25. The pointer 32 is connected to said shank 31, by means of an assembly 33, which is connected to a stem 31a, which is located in a bore of the shank 31. Fig. 7 shows a sleeve 29, which can be screwed upon the thread 25c. The sleeve 29 has a tapered lip at its bottom end, so that when the sleeve 29 is screwed upwardly, it compresses the resilient and slotted lower end of the member 25, thus gripping the associated shank. The pointer 32 is held in like manner on said shank 31, by assembly 33.

The tool is provided with supplemental hubs Ha, which are provided with the same parts which have previously been described.

If the multi-color copy corresponds to a complete page, separations of the complete page are made, one of such separations being shown in Fig. 2. This separation is placed on top of the master sheet, and in this case the register marks will be located as shown in Fig. 3, in the areas between lines 2 and 3. The tool is now placed on the separation, with its straight edges aligned with the centre lines 4 and 5, and with the pointers 32 on the registration marks 8, 8a, 8b, and 8c. The straight edges of the tool are then used for making the location marks or lines 4a and 5a. The tool is now placed successively upon the other separations of the multi-color copy which correspond to said first-mentioned separation and with the pointers 32 touching said registration marks. The straight edges of the tool are used to scribe location marks upon the additional separations of each page, so that said location marks 4a and 5a are scribed upon each separation of said page in exactly the same position on each separation.

If a colored gravure supplement is printed for a newspaper, the cylinders print a plurality of sheets (such as eight or sixteen), each cylinder printing one color, and these sheets are cut subsequently to printing.

After the negatives have been provided with location marks, the negatives which correspond to each color can be assembled with great accuracy, in a group of eight or sixteen or the like, by aligning the centre lines of the respective transparencies. A single composite or assembly positive can now be made from each group of negative transparencies. Each assembly positive can now be used for making an assembly negative on a sheet of carbon tissue. The sheets of carbon tissue can be placed upon their respective cylinders in accurate position, by making suitable markings on the cylinders, or by using well-known devices. When the cylinders are etched, the corresponding etched portions will register accurately.

If the multi-colored sheets are separated from each other in a gravure supplement, or if the supplement has only a single multi-color gravure

sheet, the sheet or sheets of carbon tissue can be accurately located on the respective cylinders, by the use of the location markings 4a and 5a. For this purpose, markings can be made upon the

5 cylinders, by well-known apparatus, and said location markings are used in combination with the cylinder markings, so that the cylinders are etched accurately.

10 These location markings are preferably centre-page markings, but they may be markings of any type and in any location.

15 In many cases, the multi-color copy for a single page will consist of two or more separated multi-color pictures. In such a case, separate transparencies are made of each picture, these transparencies having the general size of the full page. The positions of the separations on the transparencies need not be the same as the position of the corresponding picture on the page, and the angle

20 between the edges of the respective transparencies and the negative separations thereof, need not be the same as the angle between the picture and the edges of the page copy.

25 A transparent separation negative of one picture of the page is now placed over the master sheet 1, with the separation in the proper location and angle on said master sheet 1. For example, if the picture is to occupy the lower right-hand corner of the page, the corresponding separation

30 is located in the lower right-hand corner of the master sheet. Before making the separations, the multi-color picture is provided with registration marks adjacent the edges of the picture, and in such case, the registration marks will not be

35 located between the lines 2 and 3, when the negative transparency is placed upon the master sheet.

The tool is now used upon one of the separations to make the first location marks 4a and 5a, and the tool is then used upon the successive separations of the same picture, in the manner previously stated, so as to produce location marks on each transparency, in the proper positions.

This is done with each picture which is on the same page.

45 The location marks on the positives which are made from said negative transparencies, are now used to assemble said positives in proper relative position, in order to prepare the carbon tissue resist which is used for etching the cylinder.

50 If the picture is in the lower right-hand corner of the page and center page location lines are used, said lines will appear in the upper left-hand section of the separation.

55 The cylinders can be provided with markings of any type, such as centre line markings, or any other type of marking, and the carbon tissue separations are provided with corresponding markings which coincide with the cylinder markings, during the etching of the cylinders.

60 If desired, the transparencies 6 may be positives instead of being negatives, and in such case the centre lines will be marked on the light-permeable positives by means of the method heretofore described.

65 The transparencies 6 may be smaller or larger, or of the same size as the sheet of paper on which the results are to be printed.

I have shown a preferred embodiment of my invention, but it is clear that numerous changes and omissions can be made without departing from its spirit.

I claim:

1. A method of securing registration in multi-color printing with the use of a plurality of separations of multi-color copy on light-permeable material, said separations having registration marks in the same relative position on each said separation which consists in providing location markings on one of said separations by using the straight edges of a scribing tool guide, while said straight edges are in alignment with the location markings of a master sheet and while reference points of said guide coincide with said registration marks, and then locating said guide upon the other separations of said copy with the reference points of said guide coincident with said registration marks on said separations and using said straight edges to make location markings on the other separations, so that the location markings will have the same relative positions on each of said separations.

2. For use in securing registration in a plurality of separations of multi-color copy on light-permeable material multi-color printing, a tool guide having straight edges which are perpendicular to each other, said tool having hubs, sleeves turnably mounted relative to said hubs, means for clamping said sleeves in adjusted position, rods slidably mounted in said hubs, pointer mounts slidably mounted on said rods, said rods also having fine-adjustment means mounted thereon and connected to said pointer mounts.

3. For use in securing registration in a plurality of separations of multi-color copy or light-permeable material multi-color printing, a tool guide having straight edges which are perpendicular to each other, said guide having first members turnably mounted thereon, means for clamping said first turnable members in position, said first turnable members having second turnable members slidably connected thereto, means for clamping said second slidable members in position relative to the first turnable member, said second slidable members having pointer mounts slidably mounted thereon, means for clamping said pointer mounts on said slidable members, said slidable members having additional slides on said slidable members, said additional slides carrying fine adjustment means which are connected to the pointer mounts.

4. A method of securing registration in multi-color printing with the use of separations of multi-color copy on separation members, which consists in providing each said member with corresponding registration marks from the original multi-color copy, forming location markings on one of said members and then forming corresponding location markings on the other members by using said registration markings as reference points, so that the location markings on each member will have the same position relative to said registration marks, irrespective of the location of the separation on the separation member.

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