

Sept. 20, 1971

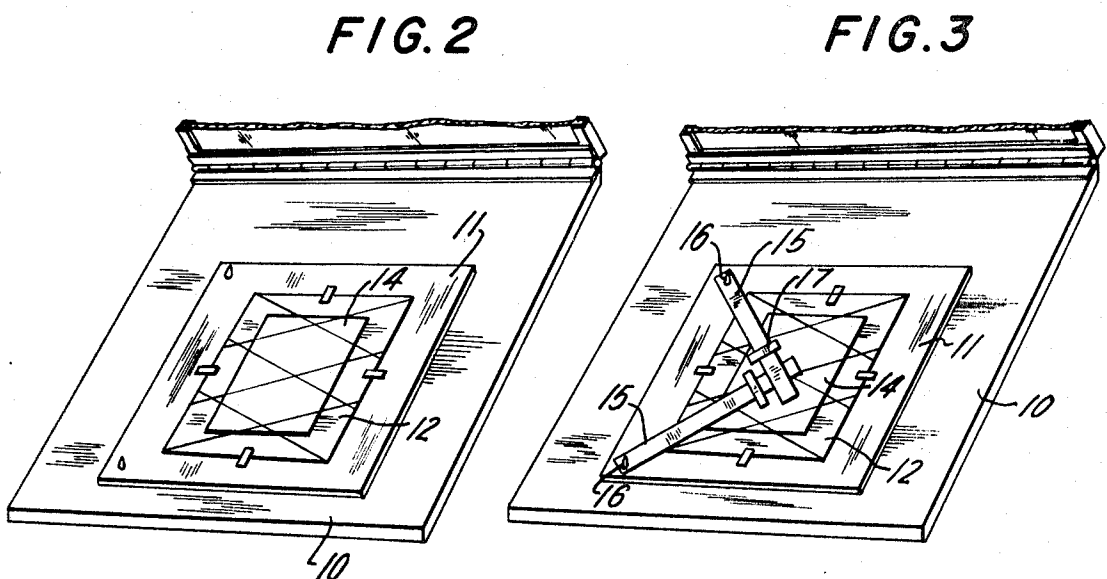
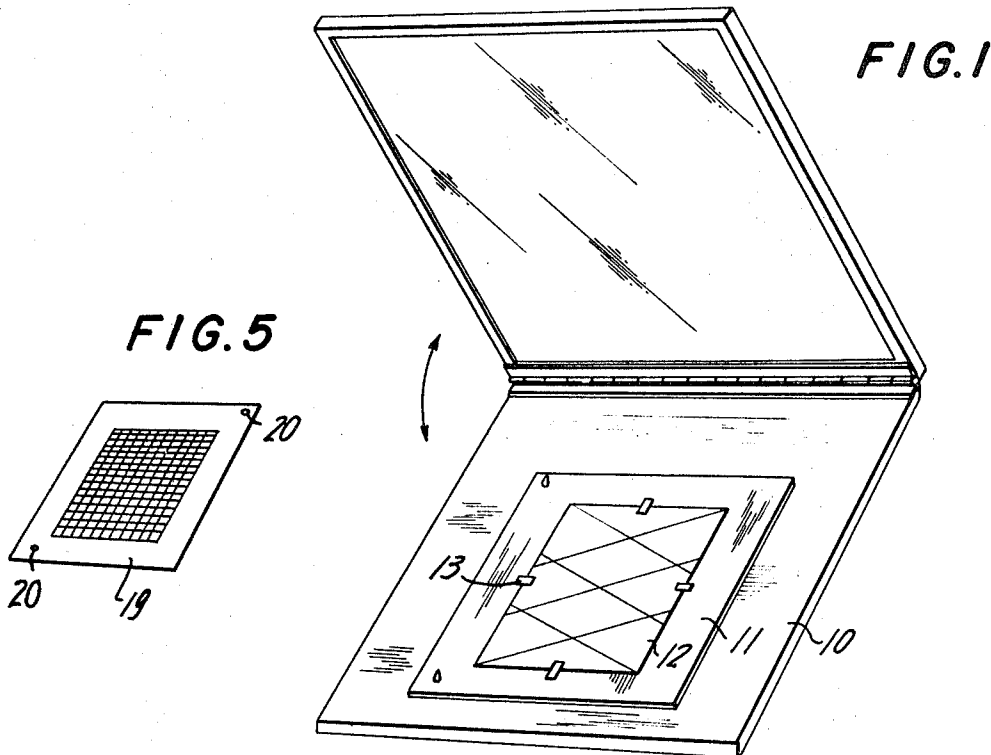
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3,605,622

ALIGNMENT METHOD FOR PLATE AND OFFSET DUPLICATION PROCESSES

Filed July 14, 1969

2 Sheets-Sheet 1



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FIG. 4

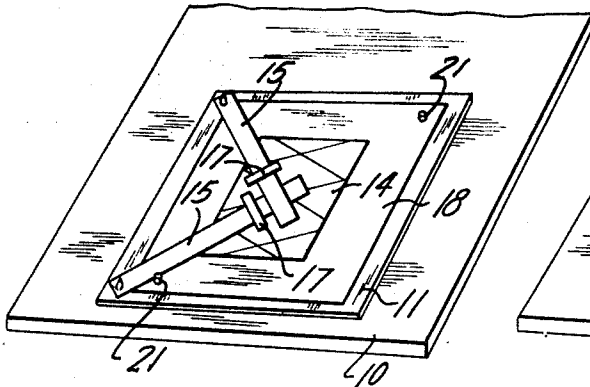


FIG. 6

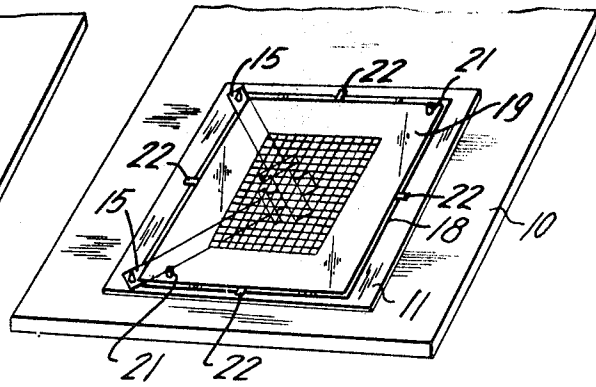


FIG. 7

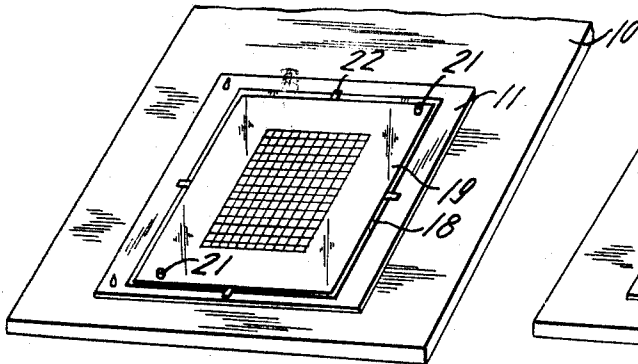


FIG. 8

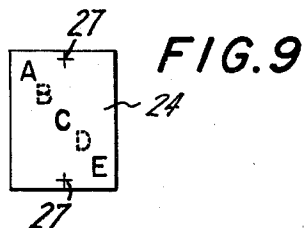
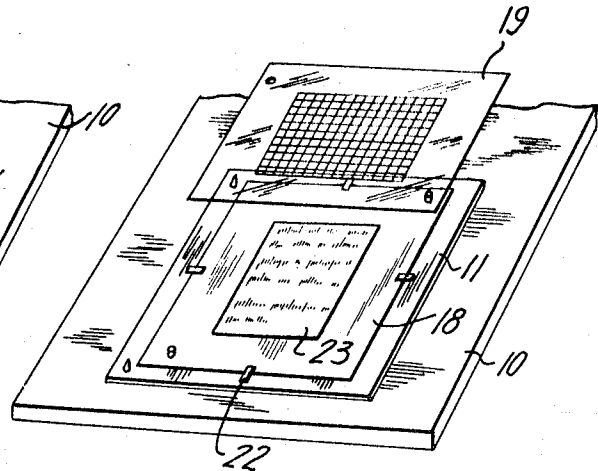


FIG. 9

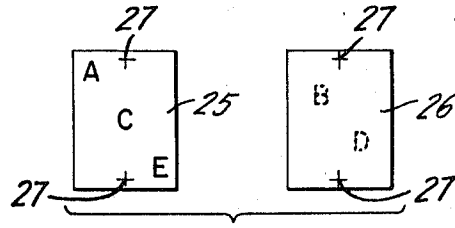


FIG. 10

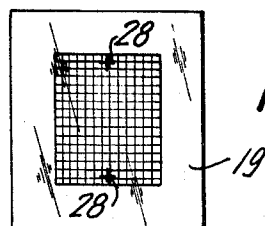


FIG. 11

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ALIGNMENT METHOD FOR PLATE AND OFFSET DUPLICATION PROCESSES

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3 Claims

ABSTRACT OF THE DISCLOSURE

A method for aligning a print in a photographic plate printing machine with respect to the edges of finished copy made in an offset duplicating machine is provided. This is achieved by fixing in place, photographing and making a printing plate of some arbitrary figure or art work, installing the plate in the offset duplicator and making at least one test print of smaller dimension than the original print. The test print is placed on the plate making machine and aligned with the original work. This represents the alignment of the edges of the copy paper with respect to the position of the work on the plate making machine. A transparent grid lined sheet is then placed over the test print to record the alignment and new plates and copy made therefrom will be in alignment with the copy paper edges.

This invention relates to a method for aligning a print, paper or art work with respect to the edges of copy paper and, in particular, to aligning the print, paper or art work at a photographic plate printing machine with respect to the edges of finished copy made in an offset duplicating machine.

In offset duplication, a plate is made by photographing the work to be reproduced. The plate is inserted into the duplicator and a feed system feeds copy paper into the duplicator and into contact with the plate. An elaborate inking system is used to ink the plate whereby the image is transferred from the plate to the copy. The printed copy is then moved out of the machine. There are many steps in the duplicating process in which the work may become misaligned with respect to edges of the copy such as at the plate making machine, at the paper feed system for the duplicator, or the plate may be somewhat misaligned in the duplicator. Any misalignment present at a particular station is a fixed misalignment which will be repeated on all copies made.

In accordance with the present invention, any misalignment in the system is corrected at the plate making machine. This is achieved by mounting the work on the bed of the plate making machine, making a plate therefrom, installing it in the duplicator to make at least one copy. Any misalignment of the work with respect to the edges of the copy paper will be immediately apparent.

Should misalignment be present, the copy, the size of which is made dimensionally smaller than the work by reduction at the plate making machine while the size of the work printed thereon remains the same, is brought back to the plate making machine, placed over the work, and the images on both visually aligned. For best results, the work should be a test work piece having a plurality of lines thereon whereby a copy made therefrom may easily be aligned with the test workpiece.

The alignment between the test workpiece and copy represents the alignment of the internal printing mechanism of the duplicator with respect to the edges of the copy as a function of the position of the test workpiece on the plate making machine. This position is then recorded by aligning a transparent grid lined sheet with the test copy and thereafter printing plates made from

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work sheets aligned with the grid lined sheet will print in excellent alignment with the copy paper edges.

The method of the present invention may be used to great advantage in the production of color copy on an offset duplicator. Color copy requires a plurality of overlays, one for each portion of the work to which a single color is to be applied. Each overlay is aligned with the other overlays as by means of a plurality of markings and a plate is made of each overlay after the alignment of the present invention has been carried out. Each plate is then separately installed in the duplicator, the same copy paper run through once for each overlay until all colors have been printed thereon. Also, a different duplicator may be used for each overlay, each duplicator being first aligned in accordance with the present invention. In this manner, an aligned color copy is achieved without the bothersome necessity of adjusting the duplicator internally for each overlay.

In the same manner, a conventional composite plate may also be made from a plurality of work pieces by aligning each workpiece with respect to the grid paper and successively photographing each individual workpiece until the composite is formed.

Referring now to the drawings in which a preferred embodiment of the invention is shown and in which like numerals refer to like parts:

FIGS. 1-8 show a step by step schematic representation of the alignment method of the present invention.

FIGS. 9-10 show how a simple two part color overlay is aligned in accordance with the present invention.

FIG. 11 shows a grid lined sheet for use with the color overlay of FIGS. 9 and 10.

Referring now to FIG. 1, there is seen a bed 10 on which is mounted a holding board 11. The bed 10 is part of a plate making machine (not shown) and is the portion of the machine on which the work from which copies are to be made is placed. A conventional plate (not shown) is made and inserted into an offset duplicator (not shown) and copies (not shown) made therefrom.

In accordance with the present invention, a diagonally lined test work piece 12 dimensionally larger than the copy to be made therefrom is mounted in fixed position on board 11 by tape 13. Any mounting means such as tacks or adhesive may also be used. A reduced size plate is made of the test work piece and inserted into the duplicator and at least one test work copy 14 made therefrom. The test copy is made on a smaller piece of paper than the test work piece 12 but the diagonal lines of the test workpiece 12 are the same size on the test work copy 14 as they are on the test workpiece 12. The test copy 14 is placed over the test workpiece 12 and visually aligned with it by matching the diagonal lines of the test copy 14 with the diagonal lines of the test workpiece 12. The test workpiece 12 may have any desired aligning indicia thereon of any design and art work may be used but, for ease of alignment, the diagonally lined test workpiece is preferred.

Once visual alignment of the diagonal lines has been done, a plurality of arms 15 are mounted on an equal number of studs 16 on holding board 11. The arms 15 are placed over test copy 14 and affixed thereto as by tape 17 whereby the position of the test copy 14 is positionally fixed. This fixed position represents the alignment of the edges of the test copy 12 with respect to the image on the test workpiece. Any other convenient means may be employed for fixing the position of the test copy relative to the workpiece.

The arms 15 are then carefully lifted to lift test copy 14 and then the test work piece is removed and an adjustment board 18 is inserted between the test copy 14 and holding board 11. A transparent, accurately lined grid sheet 19 which has a plurality of holes 20 is placed over

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arms 15 and mounted on studs 21 which are affixed to adjustment board 18 which is free to move relative to the fixed position of the test copy. Adjustment board 18 is then moved to bring the grid lines on grid lined sheet 19 into register with the edges of the test copy 14. When this has been done, the adjustment board 18 is held in fixed position as by tape 22 and the arms 15 and test copy 14 are removed. The remaining assembly is as shown in FIG. 7, the grid lines representing lines parallel to the test copy paper edges whereby any type of work which is to be reproduced on the duplicator may be easily and quickly aligned for accurate printing. The grid lined sheet 19 may have any number of lines thereon and may have these lines unequally spaced. It is particularly desirable to have a grid with outside lines that correspond to the edges of the test sheet, otherwise one or more of the edges of the test sheet are marked on the grid when it is larger than the test sheet. While a grid is preferred, it will be understood any other convenient indicia may be used on the transparent sheet 19 for locating the edges of the test copy 14 thereon and for thereafter aligning the work to be reproduced.

Alignment of work which is to be reproduced is achieved by lifting one end of grid lined sheet 19 off a stud 21 and swinging it out the way as shown in FIG. 8. The work 23 is then placed in position on adjustment board 18 and the grid lined sheet 19 is replaced over the work 23. The work is then moved into the desired position relative to the grid for printing information in that particular location on the duplicated copies. Thereafter the grid sheet is removed and a plate is made of the properly aligned work. All copies made from this plate in the duplicator will be automatically aligned with respect to the edges of the copy paper since the grid was previously aligned to the edges of the test copy. If the sheets of copy paper are larger or smaller than the test copy sheet, the work will still be aligned in the same position relative to the edges of the copy sheets. The work may be printed material, art work, or any information which is to be reproduced on the copy sheets.

Referring now to FIG. 9, there is seen a sheet of work 24 having five letters thereon, the letters A, C and E being of one color and the letters B and D being of a different color. To produce copy having all the letters in their respective colors thereon, separate overlays 25, 26 are each aligned by means of the transparent grid sheet 19 to bring the letters into the desired position on the duplicated copies and then plates are made of each overlay. One overlay has the letters A, C and E and the second overlay has the letters B and D thereon. Each of the plates is then installed separately in the duplicator and the duplicator is run to produce copy having the letters A, C and E thereon in one color and the same copy is re-run to print the letters B and D in a second color. An economically attractive alternate is achieved by making a plate for each of two separate duplicators. Each plate is aligned to the copy of the respective duplicator as described above. In this way copy paper can be run through both duplicators simultaneously and then the copy paper run through each duplicator is re-run in the other duplicator to complete the copy. As many duplicators as there are colors can be used in this system.

In an alternate method which ensures great accuracy, a plurality of guide marks 27 are placed on each overlay in identical position and, if the color copy is to be run on

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a single duplicator, corresponding marks 28 are placed on the grid lined sheet after the work of the first overlay is aligned to the grid sheet. Thereafter, the work of the second overlay is aligned by means of the guide marks on the grid sheet which thereby provides a perfect alignment of the two overlays and the colors in each run will be faithfully reproduced in the proper position on the copy. If more than one duplicator is to be used, then the marks 28 made on the grid lined sheet 19 for alignment of the work for the first duplicator are carefully measured from the copy edges as represented on the grid lined sheet 19 and relocated in the same relative position on the grid lined sheet with respect to the edges of the second test copy after it has been aligned for the second duplicator machine. This is done since the test copy for the second duplicator will most frequently be in a slightly different position relative to the grid. As a result, when the copy from the first duplicator is run in the second duplicator and vice versa, the printed information will be perfectly aligned.

It will be understood that it is intended to cover all changes and modifications of the preferred embodiments of the invention, herein chosen for the purpose of illustration, which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A method for aligning work for a plate making machine with respect to the edges of copy paper in an offset duplicating machine comprising the steps of: placing work with aligning indicia thereon on the bed of the plate making machine and making a first plate therefrom, installing the said first plate in said duplicating machine and making at least one copy therefrom, said copy being on a smaller piece of paper than said work and said aligning indicia being of the same size as on said work, removing the copy from the duplicating machine and, placing said copy over said work and visually aligning said copy to said work and recording the aligned position of said copy and said work, aligning any suitable work in the aligned position desired with respect to the recorded aligned position of said copy, and making a second plate of said suitable work.

2. A method as in claim 1 wherein said aligned position of said copy and said work is recorded by placing a transparent grid lined sheet over said aligned work and copy.

3. A method as in claim 1 wherein said work is a test work piece having a plurality of diagonal lines thereon.

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