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COLOR SEPARATION PROCESS FOR MULTICOLOR PRINTING

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6 Claims. (Cl. 95—2)

This invention relates to photographic reproduction in color, and, more particularly, to improvements in color reproduction by a photomechanical process whereby more accurate results can be obtained than with processes at present known.

In photomechanical process work, the sketch to be reproduced is photographed through appropriate filters upon a series of sensitive plates to provide a like number of color separation images from which the printing plates are prepared in any well-known manner.

Although it is theoretically possible to print reproductions to match all colors in the original by means of three printing plates corresponding to three primary colors, it is well known by all practical workers that the limitations of the photographic process and the available printing inks make it desirable if not absolutely necessary to employ a black printing plate for reproducing the blacks in the original and for restoring the shadow densities reduced by the corrections in the monochrome negatives used to prepare the color printing plates.

A large number of methods have been proposed for making black printing plates but, although they produce fairly satisfactory results, they are without exception complicated and tedious, usually involving a number of steps such as the giving of a series of partial exposures to the negative, the employment of overlays or masks and a considerable amount of hand work.

It is an object of my invention to provide a method for the direct preparation of a black printing plate in multicolor work.

Another object of my invention is to provide a method whereby color separation images and their corresponding printing plates may be made with the fewest possible steps inherent in the process and with a minimum of hand work.

Other objects and advantages of my invention will appear from the following description and its novel features are pointed out in the appended claims.

Multicolor reproduction such as four-color magazine work is usually printed in red, yellow, blue and black. The details of this process which involve the making of separation negatives used in preparing printing plates are well known and need not be specifically described herein.

To make a corrected black printing negative it is necessary that all (subjectively) saturated colors should photograph as white. This is not the same as making a correct monochrome rendering of colors in which the colors are represented as various values of gray having the same relative densities that human vision gives them and has heretofore been considered impossible to obtain by simple photography.

In practicing my improved process, a plate having a layer sensitized to the infra-red is employed in conjunction with a filter which transmits only the infra-red region of the spectrum to make the black separation negative. With this process a negative is obtained having variations in density corresponding to the infra-red reflecting power of the original and it has been found that all of the colors photograph like white and only the actual light and shade gradations appear in the negative.

In this process the saturated colors photograph like white due to the fact that all natural colors and most artificial colors reflect infra-red radiations strongly. The most notable exception is the iron double cyanide pigments frequently employed in iron blues and greens of which the more common are known as Prussian, Bronze, Chinese, Milori, Antwerp and Berlin blues, and pigments of this type should be used sparingly if at all in preparing originals to be reproduced by my present process when a black printing plate is to be used.

The fact that most colors reflect infra-red while dark blues made with iron double cyanide pigments absorb infra-red makes it possible by means of my process to separate photographically the dark blues and the light blues appearing in the original. Such separation is often desirable and has always necessitated considerable hand work in preparing the light and dark blue printing plates.

According to the present process, the original is prepared with dark blues which strongly absorb infra-red radiations and the separation negative for the dark blue printing plate is made by exposing an infra-red sensitive emulsion through an infra-red filter such as a Wratten filter No. 88A. The separation negative for the light blue printing plate is made under well-known conditions employing a red filter and the yellow and red separation negatives are made in any desired manner through blue-violet and green filters, respectively, as is well-known. It will be understood that when a dark blue printing plate is used it performs most of the functions of a black printing plate and that no black printing plate will be necessary or used.

It is thus seen that in the practice of my invention the densities in one of the color separation negatives and the printing surface in

one of the printing plates will correspond to the reflection and absorption of infra-red radiation by the original.

It is to be understood that my invention is not to be limited by the foregoing description which is illustrative rather than restrictive but is to be given the scope indicated by the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In the art of producing polytone prints corresponding visually to the colors appearing in an original, the method of obtaining printing plates to correspond to the process inks to be used which comprises creating the camera copy therefor with paints, for all but one of the colors, which strongly reflect infra-red radiations and with paints, for one of the colors, which strongly absorb infra-red radiations, photographically making ordinary color separation records from said copy, photographically making one color separation record with infra-red radiations reflected by said copy, preparing a printing plate from each of said separation records, and printing in superimposed relation from said plates, using the corresponding subtractively colored inks for the color separation plates, and a dark blue to black ink for the infra-red plate.

2. In a process of making color separation records from a multi-colored original the method of separating photographically the dark blues and the light blues which comprises creating the original with a dark blue paint which strongly absorbs infra-red radiations and a light blue paint which strongly reflects infra-red radiations, exposing a sensitive layer to visible light reflected by the original to obtain the light blue record and exposing an infra-red sensitive layer to infra-red radiations reflected by the original to obtain the dark blue record.

3. In a process of making color printing plates for reproducing the colors appearing in an original, the method of directly preparing the color separation negatives and a black separation negative which comprises creating the multicolor original with coloring materials which reflect a high percentage of infra-red radiation, separately exposing sensitized layers, respectively, to the primary colors reflected by the original, exposing an infra-red sensitized layer to an image formed entirely by infra-red rays reflected by the original, and developing each of said layers.

4. In the art of producing multi-color prints corresponding visually to the colors appearing in an original, the process comprising photographically producing separation records of the colors reflected by the original, photographically producing a separation record of infra-red reflected by the original, preparing a printing plate from each of said separation records, and printing in superimposed relation from said plates, using the corresponding subtractively colored inks for the color separation plates, and a dark blue to black ink for the infra-red plate.

5. The method of producing multi-color prints corresponding visually to the colors appearing in an original the colors of which strongly reflect infra-red comprising photographically producing separation records of the colors reflected by the original, photographically producing a separation record of infra-red reflected by the original, preparing a printing plate from each of said separation records, and printing in superimposed relation with correspondingly colored inks from the color separation plates, and with black ink from the infra-red plate.

6. The method of photomechanically reproducing in its original colors a multi-colored original having dark blue colors which are strongly absorptive of infra-red which comprises producing photographic records of exposures through red, blue-violet, green and infra-red filters, preparing a printing plate from each of said records, and printing in superimposed registered relation with each of said plates using light blue, yellow, red and dark blue inks, respectively.

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