

Feb. 1, 1944.

B. GASPÁR

2,340,656

PROCESS FOR THE PRODUCTION OF PARTIAL COLOR SELECTION PICTURES

OUT OF SUBTRACTIVE MULTICOLOR IMAGES

Filed March 23, 1937

2 Sheets-Sheet 1

FIG. 1.

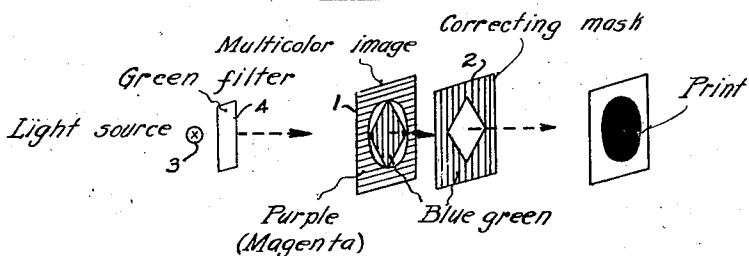
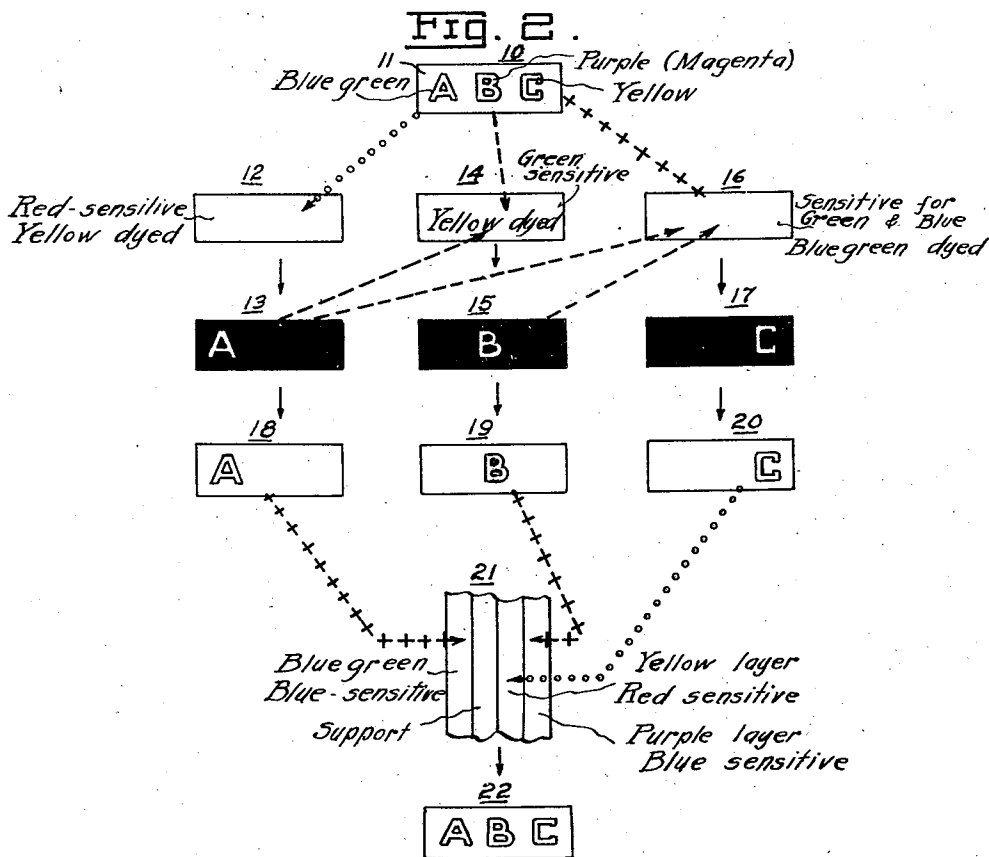


FIG. 2.



..... = Red printing light.

--- = Green " "

++++ = Blue " "

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2 Sheets-Sheet 2

FIG. 3

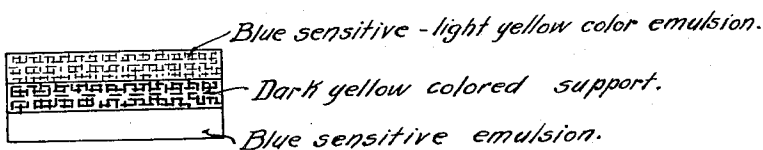


FIG. 4

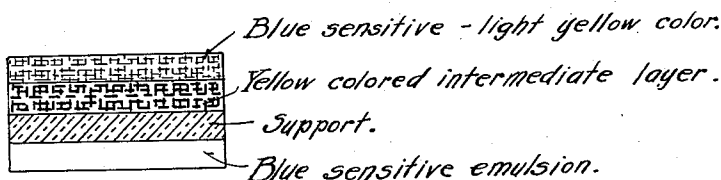


FIG. 5

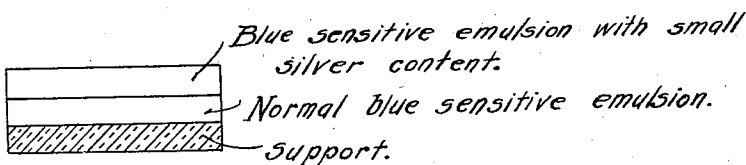


FIG. 6

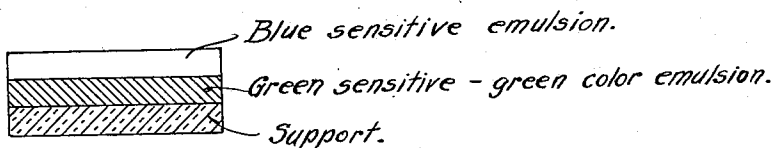


FIG. 7

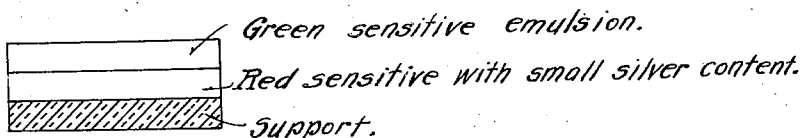
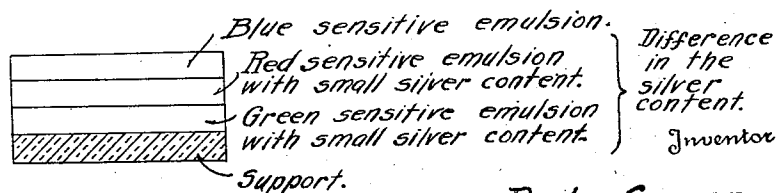


FIG. 8



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PROCESS FOR THE PRODUCTION OF PARTIAL COLOR SELECTION PICTURES OUT OF SUBTRACTIVE MULTICOLOR IMAGES

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Application March 23, 1937, Serial No. 132,611
In Germany March 24, 1936

25 Claims. (Cl. 95—2)

The subject of the present invention is a process for the production of partial color selection pictures out of subtractive multicolor images, more particularly multicolor transparencies or translucent master images. Such a multicolor image contains colored monochromatic partial images covering and completing each other subtractively to a colored image. The necessity of producing the individual partial selections of such multicolored images arises in various circumstances. For instance, the multicolor image may have been obtained directly in the camera and the individual partial selections may be required in order to serve as intermediary elements for the printing-process. In other cases, it might be necessary to reobtain from a multicolor print, such as a transparent multicolor cinema print, the various individual color selection images out of which the multicolor print has been produced. This may not only be the case if these single master images themselves are no longer available, but also if in the course of time they have changed to such an extent by unequal shrinking that they can no longer be brought into exact register. A multicolor picture, however, is modified uniformly by such shrinking and the single partial color selections produced from it are in exact register, thereby permitting the production of a print of the multicolor image even if the original photograph or the partial color selection images are no longer utilisable.

It is understood that the following examples involve the use of some of my earlier processes and materials such as those described and claimed in my patents, 1,956,122 and 1,956,017 of April 24, 1934; Patent 1,985,344 of Dec. 25, 1934; Patent 2,183,393 of Dec. 12, 1939; Patent 2,020,775 of Nov. 12, 1935; 2,071,688 of Feb. 23, 1937 and Patent 2,183,394 of Dec. 12, 1939; and Patent 2,137,336 of Nov. 22, 1938.

It is known that the individual partial color selections of a multicolor image may be obtained by printing with a printing light which is absorbed by the color of the desired partial selection picture and by using as printing material a layer which is sensitive to this particular light. In the case of a threecolor image, the three partial selections are thus produced by way of three printing steps.

It has, however, been found that, even if the work is performed in a most exact manner, it is not possible to print partial selections of such a multicolor image in the above mentioned way which are a satisfactory reproduction of those color-selection-pictures by means of which the

multicolor image was originally produced. It is therefore not possible to reobtain the single color selection images used for the production of this complete image, without introducing the difficulty of departing from the complete multicolor print and therefore the prints produced later on do not sufficiently resemble the multi-color image, the duplication of which is intended.

Exact photographic printing cannot be performed unless the printing light acts on the master image to be printed with uniform intensity throughout the whole area. In passing through the master image, the intensity of this light is diminished in proportion to the graduation of opacity of the master image and thereafter acts on the printing layer with the graduation of intensity produced by the master image. For the same reason the print of a color selection in an individual layer is bound to be incorrect if the printing light, even though originally of uniform intensity, is subjected to a regional diminution of its intensity before reaching the selection image which is actually to be printed. A diminution of intensity of this sort arises if an image of different color must be traversed by the printing light as most colors have the quality of absorbing to a certain extent even the light which they ought to transmit. For instance, a purple-red dyestuff diminishes the intensity of blue printing-light although it theoretically ought to transmit this light without diminution. A blue-green dyestuff which ought to be transmittent for blue and green is in reality not absolutely transmittent for these colors. Yellow and red dyestuffs show the most satisfactory attitude towards red light, which is almost completely transmitted by them. As a result of the above described phenomena, the blue light, for example, which is to be used for the printing of a yellow master-image does not penetrate to the printing-layer with uniform intensity if it previously is led through a layer lying in front and containing a blue-green or a purple-red dyestuff in an image-like distribution. A colored image lying behind the colored master-image has the same effect, as in this case a certain portion of the light which is to fall on the printing-layer is absorbed by this image, and therefore the correct photographic reproduction of the desired image on the printing-material is made impossible.

In accordance with this invention, the described image-like diminution in intensity of the printing-light is supplemented by an equal diminution of intensity graduated in the opposite sense. That is to say, if blue printing light, used

in printing for example the desired yellow part image, as mentioned above, is to a certain extent undesirably diminished in intensity by a disturbing blue-green image, the printing light is in addition intentionally filtered by a compensation-mask. This mask is absorbent in those regions in which the disturbing blue-green image is more or less transparent and therefore has not weakened the printing light, whereas it is transparent at those places at which the disturbing blue-green image exerts the most intense absorption. The compensation mask has therefore the character of a negative as compared with the blue-green image, if this image is assumed to be positive, and vice versa. In the simplest case, the compensation mask is of the same color as the image by which the intensity of the printing light is undesirably weakened, and in this case the distribution of color in the mask completes the image causing the undesirable effect to a homogeneously colored area, when both are superimposed. The compensation mask may also be represented by a black and white image or an image in any other color which to a certain extent absorbs the printing light. By means of the compensation mask, the local diminution of the intensity of the printing light is completed to a uniform diminution of this light, whereby the correct printing of the partial images is made possible. Another way of carrying out the idea of the invention in practice is to make up for the undesirable deficit in the printing light by means of an additional illuminating of the print behind a compensation mask which represents a colored or black and white negative of the disturbing part image. In this case the intensity of the additional printing light at all points of the image must be equal to the diminution of intensity caused by the disturbing part images. In each case, the compensation applied is adjusted in such a manner as to equalize, either by addition or subtraction, the disturbing absorption of light by the other partial images.

Example 1

A multi-color image 1 shown in Figure 1, consisting of a purple-red colored positive part image and a blue-green colored positive part image is used. From this a negative 2 of the blue-green colored part image is produced by use of red printing light. This negative is dyed blue-green at the exposed points and is then superposed with respect to the two color-film which is to be printed. Thereafter, the purple-red partial-image is printed by green light coming from light source 3 through filter 4. The blue-green areas of the multi-color image absorb a part of this green printing light, which absorption is, however, supplemented by the absorption of light by the likewise blue-green colored compensation mask, so that a uniform diminution of the intensity of the printing light is attained. Therefore the presence of the blue-green partial image no longer has a detrimental effect on the printing process, except that the printing must be slightly intensified. As shown at 5, a print is obtained of purple-red partial image.

In case three-color images in blue-green, magenta and yellow are printed, a blue-green as well as a purple-red mask are used; first, the blue-green mask is employed alone, and thereafter both masks are employed together when printing the yellow image as described above. This procedure is to be recommended for the printing of multi-color images by successive use

of different printing lights on multi-layer material possessing several layers of different sensitivity.

In the following, the invention is described by means of illustrations based on Fig. 2. For the sake of simplification it is assumed that the multi-color image 10 from which the single part images are to be reobtained, consists of a blank film 11 on which three colored letters A+, B+, and C+, appear as positives, B+ in purple-red, C+ in yellow, and A+ in blue-green.

Example 2

In the following example the application of this invention to the production of negative master images from a multicolor image is described.

A. Reobtaining of a master-image of the blue-green colored part image contained in the multi-color image.—The multi-color image 10 is first printed in the usual manner with red light or by use of a red-filter on to a red-sensitive or a panchromatic layer 12. The resulting image is developed and fixed, and thereafter represents a negative A— as shown at 13 of the blue-green colored partial image A+ contained in the multi-color image 10.

B. Producing a master image of the purple-red colored part-image contained in a multi-color image.—The multi-color image 10 is printed in the usual manner by use of green light or a green-filter on a green-sensitive or panchromatic layer 14. Before developing and fixing this image, the negative A— which has been produced previously is printed on it in faint contrast by use of the same green printing light with which the multi-color image has been printed. Or, alternatively the negative may be colored blue-green at the exposed points and may be printed in superposition with the multi-color image. The print is then developed and fixed, thereby becoming a negative B— as shown at 15 of the purple-red colored partial image B+ contained in the original multi-color image.

C. Producing a master image of the yellow colored partial image contained in the multi-color image.—The multi-color image 10 is printed with blue light on an ordinary photographic layer 16 in the ordinary manner. However, the layer is not developed, but first the negative A— and thereafter the negative B— are additionally printed on this layer. In doing so, the intensity of the printing light is regulated in such a manner as to print the negative B— with a lower light intensity than the negative A—, the latter, on the other hand, being printed with a lower intensity than the original multi-color image. Thereafter, the print is developed and fixed, whereby a negative C— as shown at 17 of the yellow colored partial image C+ contained in the original multi-color image is obtained.

The negatives A—, B— and C— obtained in this manner constitute a series of master images, which may either be used as such, if in the further course of the process negative master images of this kind are required, or can be converted into positive master images as shown at 18, 19 and 20 in the usual manner, if required. The three master images A—, B— and C— or the positives A+, B+ and C+ produced from them may be converted into dyestuff-images. The dyestuff to be used depends on the manner in which the printing layers are sensitized on to which the master-images are subsequently printed. In any case, a dyestuff is used which absorbs light-rays

to which the respective printing layer is sensitive.

Example 3

The negative A— produced in accordance with Example 2, corresponding to the blue-green partial image of the multi-color image is mordanted and dyed red at the silver places, for instance by staining by means of a basic red dyestuff. This negative is printed onto the printing layers used to produce negatives B— and C— with green or blue light instead of using the black and white negative A— as heretofore described. On the other hand, this red image may also be employed later for other purposes, for example to print the partial image A— on a layer sensitive to green or blue.

The same holds good for the negative B—, which may for instance be of a yellow, green or red color and may serve the same purposes as the black and white negative.

Example 4

A. Reobtaining the master image of the blue-green colored partial image contained in the multi-color image.—The multi-color image is first printed on a red-sensitive or panchromatic layer by red light or by use of a red-filter. The print obtained in this manner is developed and fixed, thereby resulting in a negative A— of the blue-green colored partial image contained in the original. By way of printing on an ordinary photographic layer, a positive A+ is produced. This positive A+ is used in further printing processes which require positive master images of the color selection pictures, for instance for processes in which a dyestuff is produced at the non-exposed places of the print or in which a dyestuff which was originally present is destroyed at the exposed places.

B. Reobtaining the master image of the purple-red colored partial-image from the multi-color image.—The multi-color image is printed on a green-sensitive or panchromatic layer by means of green light. The print is then developed and fixed. In this manner a negative image B— of the purple-red colored partial-image contained in the original is obtained, which negative is however not quite correct due to the fact that the printing light does not fall on the colored image B+ with uniform intensity as it is subjected to certain influences, originating for instance from the blue colored part-image. This negative B— is printed on an ordinary film. Before developing the print the positive A+ is additionally printed on it in low intensity. After developing it is fixed and serves as the second positive master image B+ for above described processes.

C. Reobtaining the master image of the yellow colored partial-image from the multi-color image.—The multi-color image is printed on an ordinary photographic layer by means of blue light. Thereupon the image is developed and fixed. In this way a negative C— of the yellow colored partial image contained in the original is obtained, which, however, for the same reasons as mentioned in connection with image B—, is not a correct reproduction. This negative is printed on an ordinary film. However this film is not developed until the positive A+ and the positive B+ have been additionally printed on the same material in low intensity, the positive A+ being printed with greater intensity than the positive B+. Then the film is developed and fixed, whereby the third positive master image C+ re-

quired for the processes mentioned above is obtained.

The three positive master images A+, B+ and C+ may for instance be printed on a multilayer material not shown consisting of three layers superimposed on each other, one sensitive to blue and dyed purple-red by diamine fast Pink G (Ullmann Enzyklopädie der Technischen Chemie, 2nd edition, volume 3, page 647), the second sensitive to red and dyed yellow by chrysophenine (color index Number 365) and the third sensitive to infra-red and dyed blue-green by diamine pure blue FF (color index Number 518). The master image A+ is printed on to the blue-green dyed layer by infrared light, the master image B+ on the purple-red layer by blue light, and the master image C+ on the yellow dyed layer by red light. The film is then developed, fixed and treated by a 5% thiocarbamide solution containing also 2½% citric acid. Thereafter it is bleached by a solution of copper chloride and fixed by a fixing solution. The image obtained after this treatment is a color-true reproduction of the original multicolor image.

Supposing that the original multi-color image does not correspond in its colors to the natural object, but that for instance the blue-green colored partial image represents the green selection of the natural object, whereas the purple red image represents the blue selection and the yellow image the red selection, the positive A+ would have to be copied on the purple-red layer with blue light, the positive B+ on the yellow layer with red light, and the positive C+ on the blue-green layer with infrared light. In this manner a color-true print of the natural object is obtained although a multicolor image has been taken as basis which does not represent the original colors.

Example 5

Three single master images are to be produced of a multi-color image, containing three partial images in superposed layers in the three colors purple-red, blue-green and yellow, and these are to be printed on a similar material. Referring again to Fig. 2 and the multi-color image 10 which is to be reproduced; the positive film 21 which is to be used for printing consists of three layers, i. e., a blue-green colored and blue-sensitive emulsion on one side of the support and a yellow-colored red-sensitive emulsion on the other side of the support, the latter layer being covered by a purple-red colored and blue sensitive emulsion. The images 18, 19 and 20 are printed on this material from both sides by use of blue light for the outside layers, and the middle layer is simultaneously printed on by way of red light traversing the purple-red layer. After the silver-image has been produced, the dyestuff is destroyed at the silver places. The master images used for printing on the material 21 must be positive images of the three partial selections and may be three master images in colors complementary to the sensitivity of the layers in which they are to be printed. In such case the two images which are to be printed on the two exterior blue sensitive layers, (one of which is colored purple-red and the other blue-green) are colored yellow, whereas the image which is to be printed on the middle layer is of a blue-green color. For producing these three-colored master images, three individual layers are employed, i. e., a yellow-dyed red sensitive one, 12, a yellow-dyed green sensitive one, 14, and a blue-green dyed layer 16 sensitive to green and blue. The

two yellow layers may be sensitized for both green and red, in which case it is possible to carry out the following process by use of only two different printing materials.

(1) First the multicolor image is printed on the yellow-colored red sensitive printing layer 12 by red light, whereupon the print is developed and fixed in the usual manner. This film then shows a black silver image on the yellow colored material and is transparent (i. e., yellow) at those places corresponding to the blue green partial selection image of the multicolor image, as shown at 13.

(2) Thereupon the multicolor image is printed on the yellow colored green sensitive film 14 by green light, and in addition, the black silver image 13 previously produced, is also printed on the same material 14 by the same light. This print is then developed and fixed and thereupon shows a black silver image on a yellow background as shown at 15, on which those places which correspond to the purple-red partial selection of the multicolor image 10 are transparent (i. e., yellow).

(3) The multicolor image is then printed by blue light on the blue-green dyed layer 16 which is sensitive to blue and green. In addition to that, the negative silver images 13 and 15 previously obtained, are printed on the same blue-green dyed layer 16 by use of green light. This film is then developed and fixed. A black silver image is obtained as shown at 17, which is transparent (blue-green) at those places corresponding to the yellow partial selection of the multicolor image.

(4) The three silver images 13, 15 and 17 produced in this manner on the two yellow films and the blue-green film are thereupon treated with a dyestuff-destroying solution, e. g. with a 5% thiocarbamide solution containing in addition 2½% citric acid, and converted in the usual manner into dyestuff images. In this manner, the positive intermediary master images shown at 18, 19 and 20 are obtained, from which the yellow images are then printed on the multilayer material 21 by blue light and the blue-green with red light in the manner described above. The dyestuff is simultaneously destroyed in all three layers of the multilayer material by bathing in a thiocarbamide solution of above mentioned composition and the further treatment results in a print 22 which is identical to the multicolor image 10.

Example 6

The multicolor image of which individual partial selections are to be produced contains positive partial images in blue-green and yellow colors, of which the yellow image represents the red selection of the photographed object and the blue-green image the green selection of this object. Such multi-color images may be obtained according to my copending application 1437, filed January 11, 1935, by photographing with a bipack, the front film of which is not colored and is sensitive to blue, whereas the back film bears two superimposed layers, one dyed yellow and sensitive to red, and the other dyed blue-green and sensitive to green, and thereafter locally destroying the dyestuff at the exposed places after exposure and development. After separation of the bipack, the front film is developed separately to a negative or to a positive. By use of red printing light the 2-color image in yellow and blue green contained in the back film is printed on a printing material having yellow colored red sensitive layer. There-

after the printing material is developed and fixed whereupon it contains a black silver image in which the parts corresponding to the blue-green parts of the rear film of the bi-pack appear yellow.

By use of blue light the back film is printed on a printing material having purple-red dyed layer sensitive to blue and red and the developed and fixed image on the yellow printing material is also printed on this purple-red layer by use of red light. Then both the yellow printing film and the purple-red printing film (after having been developed) are bathed in a thiocarbamide solution of the above mentioned composition. After destruction of the dyestuff and removal of the remaining silver, a yellow print of the blue-green partial image contained in the rear film of the bi-pack film, that is to say of the green selection, is obtained. On the purple-red printing material, a purple-red image of the yellow colored partial image registered on the rear film of the bi-pack, that is to say of the red selection, is obtained. These master images may be printed on the two exterior layers of the three-layer material 21 described in Example 5 in the same manner as explained in the previous example, the yellow colored image (green selection) being printed on the purple-red layer, the purple-red colored image (red selection) on the blue-green layer of the multi-layer material, the latter layer in this case having to be sensitive not only to blue but also to green. The blue selection produced on the colorless front film is printed from a positive master image on to the middle layer of the positive three-layer film by means of red light.

In case, in the described example, the blue-green layer of the positive film is not to be made sensitive to green, and if it is desired to use a completely identical positive material, as shown at 21, a colorless panchromatic or red and blue sensitive film is used for the master image of the yellow colored partial image, instead of a purple-red colored layer. The two-color image produced on the back film of the bi-pack is printed on this material by means of blue printing light, whereupon the black and white image of the blue-green partial image, produced on the yellow master image is additionally printed on the same material by red light. This negative master image must then be transformed into a positive and is printed by blue light on the blue-green layer of the three-layer material. The negative may also be dyed by a yellow dyestuff after producing the silver images in the layer and converted directly into a yellow positive by treatment with above-mentioned thiocarbamide solution. This yellow positive is then printed on the blue-green layer of the three-layer material by blue light.

In the preceding example the silver image originally produced by printing into the colored layer served as a compensation mask and thereafter was used for the destruction of the dyestuff at the points where silver is present thereby producing from the mask a reversed dyestuff-image constituting the required master image. A silver image originally produced by printing into ordinary colorless layers, may also serve as a compensation mask and thereafter be transformed into a reversed image, constituting the required master image. In this case the unexposed silver halide is allowed to remain in the image during its use as compensation mask and the reversed image is produced afterwards by

dissolving the silver image and developing the silver halide to form the master image. The general theory of the above examples may be explained as follows:

The image formed by dyestuff A in the multi-color image to be printed will yield at those places where neither the dyestuff A nor the dyestuff B are present a maximal blackening S_{max} of the printing material. S_{max} is determined by the intensity of the printing light and the qualities in the printing layer. At those places of the image however, the geometric coordinates of which are x and y and at which absorbing dyestuffs are present, the blackening is diminished to the extent determined by the degree of absorption of the colors present. The diminution in intensity of printing-light "I" used in printing the part-image constituted by dyestuff A is designated by the term $A_1 / x, y$. At this point the image may be defined as

$$S_{max} - A_1 / x, y /$$

Its intensity is expressed by the term

$$A / x, y / + E_B B / x, y /,$$

in which expression $A / x, y /$ represents the absorption produced by dyestuff A at the point x, y ; $B / x, y /$ represents the absorption at the same point of the image by dyestuff B of the printing light used for printing partial image B. The term E_B represents the ratio between the absorption of dyestuff B in the printing light used for printing the partial image dyed by dyestuff A) and the greater (absorption of this dyestuff B in the printing light used for printing the partial image dyed by dyestuff B). Correspondingly, the intensity of the print of the partial image dyed by dyestuff B produced by the printing light which is intensively absorbed by B is represented by the symbol

$$B / x, y / + E_A A / x, y /$$

It results from these formulae that the compensation required for the one image is

$$E_B B / x, y /,$$

whereas the compensation required for the other image is expressed by the term $E_A A / x, y /$. In accordance herewith, the latter is superprinted on the former in the ratio E_B and the former is superprinted on the latter in the ratio E_A . In this manner the images are corrected, however, they are to a slight extent weakened in intensity. This decrease in intensity may be compensated by a corresponding increase in the total intensity of light employed for printing. Frequently it is not necessary to super-print the partial selections printed by light of a short wave-length on the other partial selections printed by light of a long wave-length.

I now will describe a further possibility of executing the invention. In this modus operandi, for the intermediate print of at least one of the color selection pictures multi-layer material is used as printing material. One of the layers is used for registering the desired color selection image printed from the multicolor original, whereas the other serves as receptor of the compensation image which is to supplement the print of the desired selection in such a manner, as to compensate the errors produced in the course of the printing process. The latter layer, that is to say, the layer used for printing the compensative image, differs from the layer on which the selection itself is printed in color sensitivity, in

contents of silver, in gradation, or in coloring or in more than one of these properties, or even in all of them.

This manner of executing the invention is first to be described by way of an example, and thereafter the possibilities of varying the procedure are to be described, by which the principles in accordance with which the invention may be applied in other cases will easily be recognized.

Example 7

In order to produce on separate supports the individual color selection pictures of, for instance, a two color image consisting of a yellow colored partial image and a blue colored partial image, the two color image is first printed with red light on a film sensitized to red or panchromatically sensitized, whereby a print of the blue-green colored part image of the multicolor image is obtained. If the latter was a positive, the intermediate print obtained will be a negative.

Thereafter the multicolor image is printed with blue light on a two-layer intermediate printing material. This two-layer printing material may be composed in various ways, several of the possibilities of composition being illustrated in the attached drawings. For instance, the intermediate printing material may be made up as illustrated in Fig. 3, of two blue-sensitive layers, one on each side of the support, the latter being as thin as technically possible. This support is dyed intensely yellow, so that it is non-transmittent for blue rays striking the material from either of the two sides. Another possibility is to separate the two blue-sensitive emulsions, as is illustrated in Fig. 4 by coating the support with a gelatine layer dyed yellow by admixture of 2 gr. of tartrazine per sq. metre of the surface. This coating must be decolorizable by washing.

Of the two blue-sensitive emulsions, one is dyed sufficiently intensely by a yellow dyestuff, for instance by 0.5 gr. of Chrysophenine G to produce prints by blue light which are of a very much slighter contrast than the images produced by blue light of approximately the same time intensity value, in the colorless layer on the other side of the material. The same effect may be obtained by employing colorless silver halide layers, one of which is of a different composition than the other. For instance, as is shown in Fig. 5, an ordinary silver halide emulsion layer containing, e. g. 8 g. of silver bromide per m^2 may be combined with a silver halide emulsion layer with reduced silver content, e. g. 2 g. of silver bromide per m^2 . The latter produces a print very much softer in contrast than the former.

The two color image, from which the blue-green partial image has been printed beforehand is printed by blue printing light layer against layer, on the colorless side of the intermediate printing film, that is to say, on the side of the film bearing the emulsion producing the greater contrast when printed upon. The latent image of an incorrect print of the yellow part image of the two color image is thus obtained. If the latter was a positive, the latent image will be a negative.

The previously produced negative selection of the blue-green partial image of the multi-color image is laid layer against layer on the yellow dyed emulsion, that is to say on the emulsion producing the prints of softer contrast. It is then printed with blue light. In this way a latent positive image of low contrast of the blue-

green partial image of the two color image is obtained. This positive of low contrast represents a correction of the errors which have arisen in printing the yellow partial image. After developing, which can be done separately on each side of the intermediate printing film, a correct negative reproduction of the yellow partial image contained in the original is obtained.

For printing the incorrect intermediate print on to the one layer and the print serving as corrective image on to the other layer of the multi-layer intermediate printing film, a printing machine provided with registration pins should be employed. A machine equipped in this manner should likewise be employed in producing intermediate prints on the one-layer printing material. In this manner, the individual part-images may be printed into each other in exact register and also exact register of the image which is to be corrected and of that serving as corrective is assured. By the fact that these two images, that is to say the one which is to be corrected and the one serving as corrective, are registered on the same intermediate master image, the danger of unequal shrinking of the two images is avoided. Such unequal shrinking can occur if the corrective image is printed on a separate film. Another advantage of combining the image which is to be corrected with the corrective image on one and the same printing film is the simplification of the further procedure, as in this manner both images may be developed at the same time, so that the desired differences in contrast are produced automatically, provided that the layers of the intermediate printing material are balanced against each other accordingly.

The color selection images printed on the intermediate printing material may be employed in any way whatsoever, either directly or indirectly, for producing multi-color prints. However, attention must be paid to the fact that the presence of the yellow color in the two-layer intermediate printing material in accordance with Figs. 3 and 4 excludes the employment of blue light in the further treatment of the material. In other words, the yellow color must either first be removed or the film must be printed by use of green or red printing light.

The described example, in which the incorrect print of the partial image in question, as well as the image serving as corrective image, are printed on the multilayer intermediate printing material as black and white images represents the simplest form of application of the use of multilayer material for producing corrected selection pictures. It is for instance possible according to the invention, to produce either the print of the image which is to be corrected or the partial image serving as corrective image or both of these prints as colored prints. For instance, the silver image produced in the yellow dyed layer in accordance with Example 7 may be converted into a yellow dyestuff image by destruction of the dyestuff present. If the dyestuff destroying agent, for instance an acid solution of thiocarhamide (in accordance with U. S. Patent No. 2,020,775 issued October 30, 1931), acts at those places of the image where silver is present and therefore produces a reversed image of the partial color selection printed as a corrective image, then instead of using a negative of the blue-green partial image contained in the original to print on the yellow side of the two-layer intermediate printing material (i. e., the side producing prints of soft contrast), as described above, one must

use a positive of this blue-green partial image whereupon one will obtain a colored positive on this side. The compensated intermediate print produced in this manner shows, after destruction of the dyestuff and removal of any silver, which might still be present in the layer containing the dyestuff image, the desired negative partial selection in the form of a silver image on one side and a positive dyestuff image serving as a correction of this print on the other. An intermediate print of this kind corrected by a dyestuff compensation picture is printed by use of light for which the respective dyestuff is more or less non-transmittant, for instance blue light is used in the case of a yellow dyestuff image, and green light in the case of a red dyestuff image.

An intermediate print corrected by a yellow dyestuff compensation image and representing the red selection of the original object may be printed directly on to a blue-sensitive layer of blue-green color. In this case colorless supports are used, or if yellow filter-layers are employed, these must be decolorized before the printing is performed.

If the final print is desired in the form of a positive master image, positive intermediate prints are produced from the negative intermediate prints obtained. For producing such further intermediate prints as may be required, an intermediate print consisting of black and white images or preferably intermediate images produced on the multi-layer material described above in which the corrective image is represented by a dyestuff picture may be used. In this case it is possible to regulate the contrast or the correct coverage of the corrective image with the image to be corrected once more by choosing a printing light which is absorbed by the color of the corrective dyestuff image to the extent desired. A second regulation of the contrast may be obtained by printing the silver image contained in the two-layer intermediate printing material for a longer time than the dyestuff image present on the other side of the material. For example by switching over from a printing light color which is absorbed by the dyestuff to a printing light of a color which is transmitted by the dyestuff in question, the printing effect of the dyestuff image is stopped after a predetermined time. This method is applied in case the corrective image is too intensely colored and the basic negative is to be accentuated in comparison to the latter.

In case the primarily produced intermediate print, negative or positive, is not directly printed on the final printing material, but is employed for producing a further intermediate print, the two-layer intermediate printing material described may be used for the further intermediate prints and all of the individual partial selections may first be printed on ordinary printing material without employment of the correcting images, these images being employed when the final intermediate prints are produced on the multi-layer material described.

Example 8

A three-color film bearing blue-green partial images on one side of the support and purple and yellow images on the other side is to be printed on a multilayer material, as shown at 21 and 22 in Fig. 2, the outside layers of which are magenta and blue-green and are sensitive to blue, whereas the middle layer is yellow and sensitive to red. The image is to be produced by destruction of

the dyestuff by the aid of thiocarbamide at the places at which silver is present. First the printing is performed successively with red, green and blue light on to three layers, each of which is sensitive respectively to red, green or blue light and is coated on a separate support. In printing, the film on which a print is to be produced with red light is arranged layer against layer on the blue-green side of the multicolor image, and the films on which printing is to be performed with green and blue light are laid layer against layer on the purple-red side of the master image. The negative intermediate print produced by red light is printed directly layer against layer on to another one-layer film, producing a positive which is thereupon printed on to the blue-green layer of the final multi-layer printing material 21 shown in Fig. 2.

For the purpose of producing secondary intermediate prints of the two negative intermediate prints produced with green and blue light, a two-layer film as shown in Fig. 6 is used as a printing material. The support is coated with a layer dyed green by a mixture of chrysophenine G (Schultz I. c. No. 726) and Diamine pure blue FF (Schultz I. c. 510) and sensitized to green by the aid of erythrosine (Schultz 773), to which a second coating is added consisting of a plain emulsion sensitive to blue. The negative produced by green light is printed on the material shown in Fig. 6 by blue light, the two films being arranged layer against layer whereby a latent image is obtained in the upper layer which is however not correct. Thereupon a previously produced negative corresponding to the blue-green partial image of the original is laid upon the support of the negative being placed directly on the upper layer of the two-layer material, and is printed into the lower layer by use of green light. Thereby a latent positive image is obtained in the green layer. Thereafter, the film is developed and fixed in the usual manner and is then bathed in a solution of thiocarbamide. By this bath, the dyestuff in the lower layer is destroyed and the silver is dissolved. In the upper layer, however, which contains more silver, the silver image is only slightly affected. In the upper layer therefore a positive black silver image remains, whereas in the lower layer a negative green colored dyestuff image is obtained. This intermediate positive is printed on the blue-sensitive purple colored layer of the final three-layer material by use of blue light, for which purpose it is laid directly with its layer against the purple layer of the printing material.

The intermediate print for the third partial image is produced in exactly the same manner as has been described above. This intermediate print is laid layer against layer on to the purple side of the final 3-layer printing material and is printed with red light, the final print being produced in the yellow layer of the material. As concerns the further treatment of the multi-layer material, it is now only necessary to destroy the dyestuff in the silver regions in the usual manner by use of, for instance, thiocarbamide, whereby the final multi-color image is obtained.

In the example described above only one single corrective image was printed into each of the two multi-layer intermediate printing films for compensation purposes. However, a previously produced and corrected intermediate print as described above may in addition be printed into the multi-layer intermediate print before print-

ing the latter into the red sensitive yellow layer of the final three-layer material.

In producing the two images as described above in the two-layer intermediate printing material, the method employed may deviate in various ways from the manner of procedure laid down in above examples. For instance, in Example 8 the corrective image may be produced as a silver-image of low contrast instead of a dyestuff image, if, instead of the negative image corresponding to the blue-green partial color selection of the original, the positive produced from this negative is printed into the material, in which case, however, the printing is performed by laying the positive layer against layer on to the intermediate printing material. The contrast of color intensity on the image may be regulated by adjusting the printing light used accordingly. If a corrective image showing a hard contrast is desired, more green light is used; on the other hand, if an image of softer contrast is desired, more red light is used. In this case the treatment by thiocarbamide is replaced by a treatment with a 2% solution of sodium hydrosulphite, this treatment being continued long enough to completely bleach out all of the dyestuff present in the lower layer of the two-layer material. In case a master image on an opaque support is to be printed, the manner of procedure described in Example 8 may be followed.

Other examples of the two-layer intermediate printing material described in this specification are indicated in Figs. 7 and 8. The material represented by Fig. 8 comprises two supplementary layers, both of which contain only small proportions of silver, these proportions differing from each other. This material is to be recommended if it is necessary to produce more than one corrective image and if the corrective images produced are to show different degrees of contrast. By using this material in addition to the print of normal contrast, two further corrective prints of weak contrast are obtained in the two supplementary layers. In general, that is to say in the present example as well as in the examples described in the foregoing, the corrective layers are produced or developed in such a manner that the "gamma infinite" of the layer intended for the corrective image is at the most half the value of the "gamma infinite" of the other layer.

The words "positive" and "negative" are defined as meaning the mutual relationship of the respective images thus designated, i. e., that the points of maximum density of the respective images are inverse with respect to each other.

Instead of employing separate layers coated on each other, emulsion particles of different sensitivity, coloring or contrast may be mixed with each other and coated on the support as a single layer.

In addition to that, in accordance with the invention, the intermediate printing material may be composed by combining an ordinary emulsion with an emulsion which directly produces positive images by simple development. The two emulsions are made sensitive to different colors, the incorrect image and the image serving as corrective being printed into the material from positive master images by use of appropriate printing light. In this way, the incorrect negative print is obtained in direct combination with the image serving for correction of this print on one single film.

Instead of employing the contact printing method mentioned in the above examples, the

optical printing method may be employed in all of the processes.

By the present invention correct partial selection pictures will be obtained in each case in which the latitude of the correcting print combined with the print to be corrected is the same as the latitude of exposure of the latter i. e., when the gradation of densities of the correcting print is of opposite sign to the gradation of densities in the part image to be corrected. Of the combined images the correcting image has a maximal density which is as many times lower than the maximal density of the image to be corrected as the absorption of the disturbing dyestuff in the printing light used for printing the desired image is lower than the absorption of the dyestuff forming the desired image. This means also that the gamma of the correcting image and the gamma of the image to be corrected are in the same proportion to each other as the maximum absorptions of the disturbing dyestuff in the image and the dyestuff of the part image of the multi-color image to be printed.

What I claim is:

1. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a developed negative image of only the second named part image in a separate printing material, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only said first named part image but also to a lesser extent by the color of said second named part image, and separately exposing the second light sensitive material behind the negative print of said second named part image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

2. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of one or more differently colored part images, which comprises forming a developed negative image of each of said differently colored part images in a separate printing material, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only said first named part image but also to a lesser extent by the color of said differently colored part images, and separately exposing the second light sensitive material behind the negative prints of said differently colored part images to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a re-

sult of the absorption of said second printing light by the color of said differently colored part images, and simultaneously developing the negative and positive image in said second light sensitive material.

3. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises printing a negative image of only said second named part image in a light sensitive layer with colored light absorbed substantially alone by the color of said second named part image, developing the print thus obtained, printing a negative image in a second light sensitive material with a differently colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image, and separately exposing the second light sensitive material behind the negative print of said second named part image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

4. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises printing a negative image of only said second named part image in a light sensitive layer with colored light absorbed substantially alone by the color of said second named part image, developing the print thus obtained, printing a negative image in a second light sensitive material with a differently colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image, and subsequently exposing the second light sensitive material behind the negative print of said second named part image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

5. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which

comprises forming a negative image of only the second named part image in a separate printing material and transforming said image into a dyestuff image by coloring the exposed parts, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image and exposing the second light sensitive material behind the colored negative print of said second named part image of the multicolor image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

6. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a negative image of only the second named part image in a separate printing material and transforming said image into a dyestuff image by coloring the exposed parts the same color as said second named part image, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image and exposing the second light sensitive material behind the colored negative print of said second named part image of the multicolor image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

7. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a negative image of only the second named part image in a separate printing material and transforming said image into a dyestuff image by coloring the exposed parts the same color as said second named part image, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image and exposing the second light sensitive material behind the colored negative print of said second named part image of the multicolor image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the ab-

sorption of said second printing light by the color of said second named part image, said last mentioned exposure being made simultaneously with the printing of said negative print of said first named part image into said second light sensitive material, and simultaneously developing the negative and positive image in said second light sensitive material.

8. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a negative image of only the second named part image in a separate printing material and transforming the image into a dyestuff image by coloring the exposed parts with a dyestuff of such color and such intensity that the absorption of said image for light of a predetermined wave length in the main absorption range of the dye forming said first named part image is substantially equal and opposite to the absorption of said second named part image for the same light, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image and exposing the second light sensitive material behind the colored negative print of said second named part image of the multicolor image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image, said last mentioned exposure being made with light of said predetermined wave length and simultaneously with the printing of said negative print of said first named part image into said second light sensitive material, and simultaneously developing the negative and positive image in said second light sensitive material.

9. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a negative image of only the second named part image in a separate printing material and transforming the image into a dyestuff image by coloring the exposed parts the same color as said second named part image, printing a negative image in a second light sensitive material with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image of the multicolor image and printing the colored negative print of said second named part image in said second light sensitive material with said last mentioned colored printing light to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the ab-

sorption of said last mentioned colored printing light by the color of said second named part image and simultaneously developing the negative and positive image in said second light sensitive material.

10. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a developed negative image of only the second named part image in a separate printing material, printing a negative image with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image on a second light sensitive material and separately exposing the second light sensitive material behind the negative print of said second named part image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image, simultaneously developing the negative and positive image in said second light sensitive material and thereafter selectively printing each print into a separate layer of a multilayer light sensitive material and converting them into dyestuff images.

11. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a developed negative image of only the second named part image in a separate printing material, printing a negative image with a colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image onto a second light sensitive material and exposing the second light sensitive material behind the negative print of said second named part image to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said second named part image, simultaneously developing the negative and positive image in said second light sensitive material and thereafter transforming both prints into positives and selectively printing the positives thus obtained on the layers of a multilayer light sensitive material which layers are complementarily dyed with respect to the color selections registered in the original color selection pictures, developing the multilayer material and destroying the dyestuff in the multilayer print at the points of the silver deposit to form dyestuff images.

12. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures

each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a developed negative image of only the second named part image in a light sensitive layer of a separate printing material, said layer being colored by a dyestuff which is transmittant for light used in printing said negative image, printing a negative image with a differently colored printing light absorbed by the color of not only the first named part image but also to a lesser extent by the color of said second named part image on a second light sensitive material, exposing the second light sensitive material behind the negative print of said second named part image with light transmitted by the dyestuff used for staining the same to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said differently colored printing light by the color of said second named part image of said multicolor image, simultaneously developing the negative and positive images in said second light sensitive material and transforming both prints into colored positives, selectively printing each print into a layer of a multilayer light sensitive material, and converting them into dyestuff images.

13. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures each in a different coloring matter, one of said color selection pictures being a part image recorded by a dye of such absorption characteristics that light which said dye absorbs to a substantial extent is also absorbed by said multicolor image as a result of the absorption of a second differently colored part image, which comprises forming a developed negative image of only the second named part image in a light sensitive layer of a separate printing material, said layer being colored by a dyestuff which is transmittant for light used in printing said negative image, printing a negative image with a differently colored printing light absorbed by the color of not only said first named part image but also to a lesser extent by the color of said second named part image on a second light sensitive material, exposing the second light sensitive material behind the negative print of said second named part image with light transmitted by the dyestuff used for staining the same to produce a positive image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said differently colored printing light by the color of said second named part image of said multicolor image, thereafter simultaneously developing the negative and positive images in said second light sensitive material and transforming both prints into colored positives in colors complementary to the sensitivity of the layers of a multilayer light sensitive material which layers are complementarily dyed with respect to the color selections registered in the positive part images, selectively printing the colored positive prints in the layers of the multilayer material, developing, and destroying the dyestuff in the multilayer print at

the points of the silver deposit to form dyestuff images.

14. A method of producing color selection pictures from a subtractive multi-color image containing the individual color selection pictures in different colors which comprises printing with colored light absorbed substantially alone by the color of the part image to be printed in a light sensitive layer, developing and transforming the print into a dyestuff image by coloring the exposed parts, printing with a differently colored printing light absorbed by the color of not only a second part image which it is intended to print but also to a lesser extent by the color of the first named part image of the multi-color image on a second multi-layer light sensitive material one layer of which is sensitized for light rays which are chiefly absorbed by the color of the second part image of the multicolor image and another layer of which is sensitized for light rays of a different spectral region said light rays being those chiefly absorbed by the dyestuff image in said first print, and printing said print of said first named part image into said last mentioned layer to produce an image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said first part image of the multicolor image.

15. A method of producing color selection pictures from a subtractive multi-color image containing the individual color selection pictures in different colors which comprises printing with colored light absorbed substantially alone by the color of the part image to be printed in a light sensitive layer, developing and transforming the print into a dyestuff image by coloring the exposed parts, printing with a differently colored printing light absorbed by the color of not only a second part image which it is intended to print but also to a lesser extent by the color of the first named part image of the multi-color image on a second multi-layer light sensitive material one layer of which is sensitized for light rays which are chiefly absorbed by the color of the second part image of the multi-color image and another layer of which is sensitized for light rays of a different spectral region said light rays being those chiefly absorbed by the dyestuff image in said first print, printing said print of said first named part image into said last mentioned layer to produce an image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said first part image of the multi-color image, and transforming said compensating image into a dyestuff image by coloring the exposed parts.

16. A method of producing color selection prints from a subtractive multicolor image containing each of the individual part images as dyestuff images in different colors having overlapping absorption characteristics, which comprises printing by means of a colored light which is mainly absorbed by the color of the part image intended to be printed but due to said overlapping absorption characteristics is also absorbed to a lesser extent by the color of one or more additional part images into a printing material sensitized to this light, separately printing a partial image into said printing material with light to which said printing material is sensitive from a compensating master image possessing

the same degree but opposite gradation of opacity as the disturbing image produced during the printing of said part image intended to be printed by reason of the overlapping absorption characteristics of said dyestuff images, and simultaneously developing the images in said printing material.

17. A method of producing color selection prints from a subtractive multi-color image containing each of the individual partial images as dyestuff images in different colors having overlapping absorption characteristics, which comprises printing by means of a colored light which is mainly absorbed by the color of the part image intended to be printed into a printing material sensitized to this light, separately printing a partial image into said printing material with light to which said printing material is sensitive from a compensating master image representing only a different part image of said multi-layer image, said partial image possessing the same degree but opposite gradation of opacity as the disturbing image produced by said different part image of said subtractive multi-color image the color of which absorbs said first mentioned printing light to a lesser extent and simultaneously developing the images in said printing material.

18. A method of producing color selection prints from a subtractive multi-color image containing each of the individual partial images as dyestuff images in different colors having overlapping absorption characteristics, which includes printing by means of a colored light which is mainly absorbed by the color of the part image intended to be printed into a printing material sensitized to this light, and which includes the steps of producing a compensating master image by printing an image of a second part image only, the color of which absorbs said printing light to a lesser extent, into a different light sensitive printing material with a printing light mainly absorbed by the color of said second part image, and separately printing into said first referred to printing material with light to which said printing material is sensitive from said compensating master image a partial image which possesses the same degree but opposite gradation of opacity as the disturbing image produced in said first referred to printing material by said second part image and simultaneously developing the images in said first referred to printing material.

19. A method of producing color selection prints from a subtractive multicolor image containing each of the individual partial images as dyestuff images in different colors having overlapping absorption characteristics, which includes printing by means of a colored light which is mainly absorbed by the color of the part image intended to be printed into a printing material sensitized to this light and which includes the steps of producing a compensating master image by printing an image of a second part image only, the color of which absorbs said printing light to a lesser extent, into a different light sensitive printing material with a printing light mainly absorbed by the color of said second part image, and separately printing into said first referred to printing material with light to which said first referred to printing material is sensitive from said compensating master image a partial image which possesses the same degree but opposite gradation of opacity as the disturbing image produced in said first referred to printing

material by said second part image, simultaneously developing the images in said first referred to printing material, and converting said compensating master image, and the images in said first referred to printing material into reversed dyestuff images to form positive master dyestuff images of said part image intended to be printed and said second part image.

20. A process for producing multi-color prints from subtractive multi-color images containing each of the individual partial images as dyestuff images in different colors which have overlapping absorption characteristics, wherein an intermediate print is produced of each of at least two partial images contained in the multi-color master image and is transferred either directly or by way of further intermediate prints to the final print, which includes the steps of printing a partial image of said multi-color master image to form an intermediate print in one layer of a multi-layer light sensitive printing material with a colored light to which said one layer is sensitive and which is mainly absorbed by the color of said part image but absorbed to a lesser extent by another partial image, and separately printing an image of another partial image only into another layer of said multi-layer printing material with light to which said other layer is sensitive to form a corrective print said corrective print having the same degree but opposite gradation of opacity as said other part image of said multi-color master image and being of sufficient density to correct for the undesirable image obtained in said one layer of said multi-layer printing material from said other part image and simultaneously developing the images in both of said layers.

21. A method of producing color selection pictures from a subtractive multicolor image containing the individual color selection pictures in different colors which comprises printing with colored light absorbed substantially alone by the color of the part image to be printed in a light sensitive silver halide layer, developing the print thus obtained, printing with a differently colored printing light, absorbed by the color of not only a second part image which it is intended to print but also to a lesser extent by the color of the first named part image, on a second light sensitive material and exposing the second printing material behind the unfixed print of the first named part image to produce an image in said second light sensitive material which compensates for the undesirable image obtained therein as a result of the absorption of said second printing light by the color of said first part image, dis-

solving the silver deposit from the unfixed prints and developing again.

22. The method of producing a corrected color component image of a colored object by use of a photographic element having two sensitive layers permanently attached to a support, which comprises forming a negative image of one of the primary color components of the colored object in one of the sensitive layers, forming a positive image of another of the primary color components of the colored object in the other sensitive layer, the positive image being superposed and in register with the negative image, and printing both images simultaneously to form a corrected color component record of the colored object.

23. The method of making a corrected color selection image which comprises forming a strong and a weak image in two superposed emulsion layers of different spectral sensitivities respectively, said images representing different color selections of a multicolor image, and thereafter developing one of said images as a negative and the other as a positive without separation of the layers.

24. The method of making a corrected color selection image which comprises forming a strong and a weak image in two superposed emulsion layers of different spectral sensitivities respectively, one of said layers being an ordinary negative emulsion and another layer being a direct positive emulsion, said images representing different color selections of a multicolor image and thereafter simultaneously developing both layers to provide a negative image in the first layer and a positive image in the second layer.

25. The method of making a corrected color component image in a photographic element having two superposed silver halide layers, one of which contains a dye uniformly dispersed therein, which comprises forming in the layer not containing the dye a negative metallic silver image representing one of the primary color components of a colored object, forming in the layer containing the dye a negative metallic silver image representing another primary color component of the colored object, bleaching the dye in the region of the last-mentioned negative image to form a positive dye image serving as a masking image and printing through the two images simultaneously with light of a color substantially complementary to the color positive dye image to form a corrected color component image representing the color complementary to that represented by the negative image.

BÉLA GÁSPÁR.