Dec. 14, 1943. A. R. BOURGES 2,336,590

METHOD OF ORNAMENTATION

Filed Dec. 14, 1940

Fig. 1

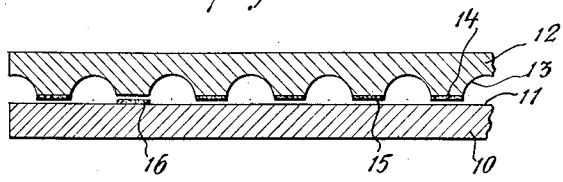


Fig. 2

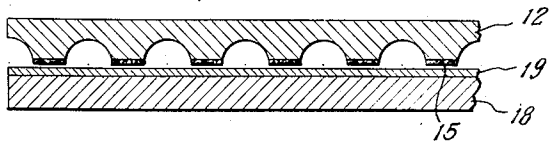
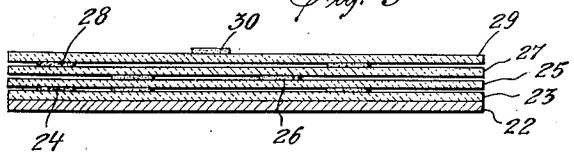


Fig. 3



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METHOD OF ORNAMENTATION

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9 Claims. (Cl. 41—46)

This invention relates broadly to the art of surface ornamentation and to the reproduction of copy of every description, and relates more particularly to a novel method of preparing copy for reproduction and, as well, to a novel method of preparing negatives, positives and printing plates by the use of novel inks and masks in combination with Ben Day and other similar machines employing the transfer method.

In line cut, as distinguished from photographic half-tone work, ornamental border effects, special backgrounds, breaking up of solid masses by grain or stipple forming shadows, and many other toning effects are obtained by the use of the Ben Day and other similar machines. The screens used in connection with this machine and method consist of thin, gelatine-like, substantially flexible films tautly mounted in a frame. The lower surface of the screen is embossed in relief with the particular pattern to be transferred.

In use, the frame is pivotally mounted in a member from which it may be readily removed in order to place the screen, pattern side up, on a suitable support or pad to enable the operator to apply to or "roll up" this embossed surface with a special black etching or transfer ink. In accordance with the usual method of carrying out this process, the plate carrying the key image or the lithographer's stone, the photographer's image, or in some cases the copy, is placed directly below the hinged screen. When the screen is lowered into operative position this embossed surface to which the black transfer ink or resist material has been applied is positioned only slightly above, but not in actual contact with, the plate. The resist ink is now transferred to the plate in selected areas by applying pressure on the upper surface of the screen by means of a roller, in the case of relatively large areas, and a small stylus in the case of the smaller areas.

Before any of the black opaque ink has been applied to a new screen the screen is substantially transparent. When the ink is applied, however, the transparency of the screen is reduced to a marked degree, and each successive application renders the screen relatively more opaque. Thus, the operator for the most part works "blind," and he cannot determine what effect he is obtaining in given areas, particularly in relation to the other elements of the design. As a result he is continually required to transfer a small portion of the design, raise the screen to see if the effect is artistic and proper, and then lower his screen for further application. Moreover, it is utterly impossible to confine the shading within the desired areas defined by the lines in the plate. As a result it is necessary to apply a water-soluble gum over the surface outside such areas, and this gum or "gambouge" is thereafter washed off the plate, carrying with it the transferred design on these unwanted areas.

It is one of the principal objects of the present invention to provide means for permitting the transfer artist to see each and every portion of the design reproduced on the plate or other medium positioned beneath the screen as he proceeds with his work. Heretofore all of the transfer or etching inks used in connection with the transfer or Ben Day method have been black opaque inks, and in accordance with the present invention the transfer etching inks are transparent. It will thus be apparent that the screen does not become darkened and rendered less transparent through use, since the transparent colorless ink or "size," as distinguished from the black transfer etching ink hitherto used, makes the Ben Day work visible and controllable as it proceeds, thus greatly simplifying the process.

This visibility not only greatly relieves the eye strain of the artist, but further relieves him of the present need of remembering just what effect he desires to get in the transfer process. In other words, by the older method of employing the black opaque ink the artist must raise the screen, observe the plate, lower the screen, and then transfer the detail, and in effect try to remember the tone value which the screen he is using produces. For this reason it requires an apprentice period of from five to six years before a man acquires any measure of proficiency, and many more years are required before he is considered a true expert. By employing the transparent colorless ink, however, in accordance with the present invention, far better results are obtained in much less time.

The precise reason why the surface ornamentation art has always regarded the use of a black opaque ink as necessary in connection with Ben Day and tint laying work is not known. If the black opaque transfer ink is applied to the surface of the plate to a uniform depth and complete coverage, such ink forms, as is well known in the art, an adequate resist for the etching solution. In the Ben Day work, however, it is virtually impossible to apply the ink in such a fashion, and it has accordingly always been considered necessary to apply certain pow-

ders to the transferred ink to make the resist effective.

By using the transparent colorless ink of the present invention the deposit on the plate or other medium, both as to depth and coverage, is substantially the same as the deposit of the black opaque ink heretofore employed. Moreover, the artist applies the powder to the transparent ink in the same fashion as such powder was previously applied to the black ink, making it both visible and creating a perfect resist after the usual "burning-in." By employing the transparent ink of the present invention the need for gambouging or painting out becomes no longer necessary in all cases, since the operator can see exactly what he is doing by applying the usual dusting powders to the work as he proceeds.

Another object of the present invention is the provision of a transfer screen having on its raised portions a novel resist material comprising a transparent colorless ink, whereby such ink may be applied to the plate or other medium in considerably less time than can be done under present conditions.

Another object of the present invention is the provision of an improved method for the reproduction of copy, and more important still, for the creation of copy which consists in applying the Ben Day detail to a sheet of transparent material.

Originally, the Ben Day method was created primarily for applying the tone directly to the drawing or other form of copy. This did not prove satisfactory, however, for the reason that the artist could not see the work he was doing, and more important still, he could not correct any errors after the tone had been applied to the paper. Accordingly, the general practice in recent years has been to apply the Ben Day tone either to the plate or to the negative. In accordance with the present invention, however, a sheet of transparent material, such as cellulose acetate, is placed over the copy, the negative or the plate, and the detail or tone applied to this transparent sheet. In this manner a transparency carrying the detail is created which may thereafter be used, either as a negative or as a positive, for contact printing or for photographing after this detail has been rendered photographically opaque by the addition of powder.

In accordance with existing practices the transferred design does not always adhere properly to the plate during the subsequent etching process. In many instances the design comes off the plate or "lifts," thus causing the plate to be ruined by the etching solution. Accordingly, all plates having the Ben Day transfer ink thereon must be very carefully handled, and it is accordingly a universal practice in the trade to charge considerably above the scale price for etching Ben Day plates.

In the absence of the Ben Day transfer, however, three types of photographic resist are employed, each of which adheres very closely to the plate during the etching process. The first type of resist is known as an "enamel" which is burned into the plate after exposure and provides a very effective acid resist. The second type is referred to as the "cold top," which is somewhat similar to the enamel resist except that it is not burned in. A third type is the photographic rolled-up ink resist, referred to in the trade as "ink top," the plate being rolled up with the special ink after the same has been exposed.

The foregoing methods are all highly satisfactory and difficulty is seldom incurred during the carrying out of the processes. The resist formed by the transfer method is, however, the most undesirable of all, since if the plate is in any measure greasy the resist ink will not adhere, and the results are in any event seldom uniform. One of the principal objects of the present invention is to avoid the foregoing objection to the ink resist formed by the transfer method, the invention in this instance consisting of creating a negative or positive on a sheet of transparent material by applying the Ben Day transfer to a sheet of transparent material instead of to the plate or photographic negative. This method may be used in black and white as well as in multicolor reproduction.

A further object of the present invention consists of a new and novel method of creating original copy by the use of the Ben Day machine, which copy may be either in one color or in a plurality of separate transparent sheets in transparent colored inks, such as red, yellow and blue, and thus when the several transparent sheets are superimposed in proper register the entire finished composite drawing can be observed in full color.

Yet another object of the invention is to provide a method of outlining on a single transparency for all negatives or plates in process color work, instead of the present method of outlining each negative separately or cutting an outline in each color plate.

In the drawing:

Fig. 1 is a broken transverse section, greatly enlarged, taken through a flat metal plate and a transfer screen, the screen being positioned adjacent to but spaced from the upper surface of such plate.

Fig. 2 is similar to Fig. 1 but shows a sheet of transparent acetate or similar material superimposed on the upper surface of the flat metal plate.

Fig. 3 is a greatly enlarged transverse section taken through a plurality of superimposed sheets of the transparent material for the creation of color copy.

Fig. 1 illustrates the invention insofar as it relates solely to the use of transparent colorless inks instead of the black opaque transfer inks presently used in the photo-engraving arts. The flat metal plate 10, which, when etched, will constitute the printing plate, carries on its upper surface 11 a photographic guide or image (not shown) which is produced in the manner well known in the art. The Ben Day or transfer screen is formed on its lower surface with a plurality of spaced protuberances 13, each having a substantially flat lower surface 14. Screen 12 is formed from gelatinous material, all as is well known, and it is mounted within a frame (not shown).

Prior to use, the screen is inverted, placed upon a suitable flat support, and this now upper surface is "rolled up" with a transparent, colorless tacky ink, leaving a thin film or deposit 15 on these raised surfaces. It will accordingly be apparent that when the embossed surface of the screen, carrying the transparent ink on the flat lower surfaces 14 of the protuberances, is placed in the position shown in Fig. 1, and pressure exerted on the upper surface thereof by means of a stylus or roller, the screen will transfer the ink to the upper surface of the plate at the point

of contact. One of such transferred dots is shown at 16.

Inasmuch as the guide lines on the plate 10 can be clearly seen through the screen 12, the need for any gambouge or painting out is largely eliminated. After the ink has been deposited in all of the desired areas defined by the guide lines the screen is raised and dragon's blood or similar powder is dusted on the upper surface of the plate, creating both opacity and an etching resist.

In Fig. 2 the element 18 may be either the black or key plate similar to plate 10, shown in Fig. 1, or it may be the original artist's copy. Superimposed on the upper surface of element 18 is a sheet of transparent cellulose acetate or other similar material 19, and the transfer of the transparent ink or size from screen 12 is made onto the transparent sheet instead of the plate or the artist's copy. In the event that element 18 is the artist's drawing, such drawing may, if desired, have superimposed thereon one or more transparent shading sheets carrying on one surface thereof any desired detail. Shading sheets of this character, which are described in Hutchison Patent No. 1,614,924, are well known and widely used in the graphic arts, and the detail carried thereon, which may be half-tone dots or any other Ben Day or other character effects, is friable in nature and may be easily removed by the operator.

The essential difference between the dots or other character effects carried on the shading sheets, and the shading effects created by the Ben Day or other transfer method, is in the fact that the dots on the shading sheets cannot be increased or decreased in size, whereas in the transfer method a small or large dot can be obtained depending upon the pressure applied to the upper surface of the transfer screen. In other words, the transfer method gives certain modeling effects which cannot be obtained by the shading sheets.

After the Ben Day effect has been transferred to the transparent sheet 19, the upper surface is dusted with powder to make the transferred detail photographically opaque. In the event that the element 18 is the black or key plate, it will have all the detail necessary for such black or key plate thereon, and in this instance the transparent sheet 19 is used for making one of the color plates. The word "transparency" as used hereinafter will be deemed to mean a transparent sheet with the detail thereon in either negative or positive values.

By superimposing on the artist's copy the shading sheets previously mentioned, and also the transparent sheet 19 to which has been transferred all the additional Ben Day modeling, a composite copy carrying all the detail for the eventual key plate is produced, and when this composite copy is photographed a negative carrying all such detail is produced. The black or key plate made from this negative can accordingly always be duplicated by making another contact print. Moreover, by this improved method of preparing the semi-mechanical transparencies, any number of duplicate prints of these transparencies can be made, whereas under present practices duplication of Ben Day effects is very difficult and expensive. Accordingly, it has always been considered necessary to make electrotypes for duplicate sets. Whereas the transparent ink is preferable in this process, it will be obvious, however, that black opaque transfer inks of the kind now in use may be employed with fair results.

Another singular advantage in the foregoing method resides in the fact that the modeling on the transparencies can be corrected with ease, since the deposit when dry is friable and may be removed by simply rubbing off with a stylus or other instrument. Thus, if the artist or the operator is not pleased with the effect he has created, he may make any change he desires. When the Ben Day detail is transferred directly to the plate in accordance with existing practices, it is very difficult to make changes or corrections.

Another outstanding advantage in the present method of applying the Ben Day tone to transparent sheets resides in the fact that prints for the first time can be made on copper by the enamel top process. Such prints can be re-etched to almost any tone value desired, the same as is now the practice in process color work employing the half-tone color separation method.

The application of the present invention of transferring the Ben Day design to a transparent sheet rather than to the metal plate, as applied to the creation of composite color copy, is illustrated in Fig. 3. In this instance, the ink will be transparent as before, but will be in one of the usual transparent process colors as a rule. In other words, if a four-color reproduction is desired, the ink employed will be black and transparent yellow, red and blue. This method can be carried out in several ways, although it is preferred to provide a color copy or key guide which is designated by the reference numeral 22. The content or details of such color copy or key guide are not illustrated herein since this may constitute anything from a brief outline drawing with rough color guide, to a finished artist's drawing in full color.

A transparent sheet 23 is superimposed on the color guide and the colored transparent ink transferred from the Ben Day screen directly onto the upper surface of transparent sheet 23. In accordance with the preferred method of carrying out this process the first color applied will be the usual process yellow, which is indicated at 24. Transparent sheet 23 may now be removed from the color copy, and a second transparent sheet 25 for the red color be superimposed on the color guide or copy. The Ben Day tone is now transferred to the second sheet, as indicated at 26. Transparent sheet 27 is now superimposed on the color guide, and the blue tone 28 transferred thereto. The same process is repeated on the fourth sheet 29, upon which the black tone 30 is deposited.

After the transparent colored inks on the several transparent sheets have dried, which drying may be accelerated by the use of a transparent powder such as stearate of zinc, the several sheets may be superimposed one upon the other, as shown in Fig. 3, with the aid of the usual register marks (not shown), and the complete or composite picture can now be submitted to the user for approval. In the event that corrections are to be made, the transferred tone or detail can be removed or altered on any given sheet, as previously described. In the areas wherein one of the transparent tones carried on one of the sheets overlies a transparent tone carried on another of the sheets, as, for instance, tone 28 in blue on sheet 27 overlies tone 24 in yellow on sheet 23, a green tone will result. Also, it will be apparent that if a solid tone is desired rather than a Ben Day tone, the area wherein such solid tone is desired may be painted in solid with the same color. It will further be appreciated that a solid tone can be applied by the transfer meth-

od. In this instance the transfer screen will have a smooth unbroken lower surface.

After the composite picture has been observed, if any extra detail, either lines or solids, is desired, they can be added to the transparency. When the composite drawing has been approved, each transparent sheet carrying the detail in color is rendered photographically black and opaque by applying black powder which will turn any of the applied colors black by virtue of the "tooth" in the transferred ink. The Ben Day detail must be applied to each transparent sheet in positive values to make the composite color picture. After rendering the detail black and opaque, each transparent sheet may be used as a positive for contact printing in the case of deep-etched offset plates, silk screen and gravure printing. In the case of photo-engraving, it will be necessary to make reverse values by the well known contact principle, thus securing a negative value for photo-engraving and albumen offset plates.

What I claim is:

1. In the art of reproduction of copy, the method of applying detail by the transfer process, through the use of a transfer screen, which consists in the steps of superimposing a sheet of transparent material on a copy of the image to be reproduced, applying a substantially transparent ink to the transfer screen, transferring the detail from the transfer screen to such transparent sheet, and then rendering the transferred detail photographically opaque.

2. In the art of reproduction of copy by applying detail by the transfer process, through the use of a transfer screen, which method consists in the steps of superimposing a sheet of transparent material on the copy or on a reproduction thereof, applying a transparent ink to the raised portions of the transfer screen, transferring the detail from the transfer screen to such transparent sheet, rendering the transferred detail photographically opaque by applying a powder thereto, and then reproducing the transferred detail, using the transparent sheet as a negative or positive.

3. In the reproduction art, the method of preparing composite copy by applying detail to such copy by the transfer process, through the use of a transfer screen, which method consists in superimposing a shading sheet having detail in desired areas thereof on the line copy, then superimposing a sheet of transparent material on the sheet, transferring detail by the use of a transparent ink from the transfer screen to desired areas on the transparent sheet and then rendering the transferred detail photographically opaque by the application of an opaque substance thereto which will adhere to the transferred detail, thus forming complete copy which may be photographed to form a negative.

4. In the art of reproduction of copy by applying detail by the transfer process, the method which consists in superimposing a sheet of transparent material on a key plate containing a reproduction of the copy, applying a transparent ink to the transfer screen, transferring detail from the transfer screen to desired areas on the transparent sheet and then rendering the transferred detail photographically opaque by the application of an opaque substance thereto which will adhere to the transferred detail, thus forming a negative or positive, and then forming a printing plate therefrom.

5. In the reproduction art, the combination of a transfer screen formed of substantially transparent material having an all-over design embossed in relief on the lower surface thereof, and a substantially transparent resist material carried on the relief portions of said lower surface, whereby when said surface is placed in engagement with a printing plate or other medium, for transfer of the resist material to the plate by the application of pressure to the upper surface of the screen, the plate and all detail imprinted thereon will be optically visible.

6. In the art of reproduction of copy by applying detail by the use of a substantially transparent transfer screen to the copy, a negative thereof, or a printing plate formed from the negative, that step which consists in applying to the transfer surface of the screen a substantially transparent transfer ink, whereby the transparency of the screen will not be impaired.

7. In the art of color reproduction of copy, the method of forming negatives or positives for the production of separate color plates by the transfer process, through the use of a transfer screen, which consists in the steps of forming a key image of the copy, successively superimposing on said key image a sheet of transparent material for each color plate desired, applying a transparent ink to the screen, transferring detail from the transfer screen to the sheet in desired areas, and then rendering the transferred detail opaque.

8. The method of creating copy in color for reproduction which consists in successively superimposing on an outline guide a sheet of transparent material for each color required in the copy, transferring detail in a transparent colored ink from a transfer screen to such sheet and then superimposing the several sheets, one upon the other in register.

9. The method of creating and reproducing copy in color which consists in successively superimposing on an outline guide a sheet of transparent material for each color required in the copy, transferring detail in a transparent colored ink from a transfer screen to such sheet and then superimposing the several sheets, one upon the other in register, to form the copy, then rendering the transferred detail photographically opaque and forming color printing plates from the several sheets.

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