Aug. 29, 1933. B. J. KELLY 1,924,501

PRINTING

Filed Feb. 1, 1933

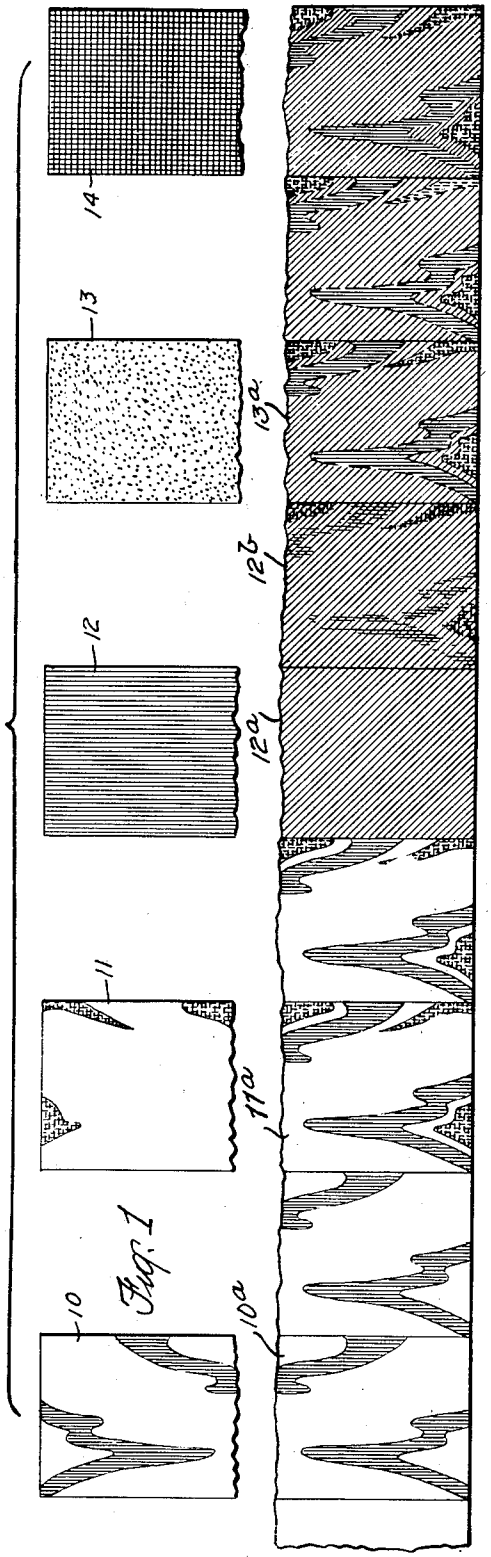


Fig. 1

Fig. 2.

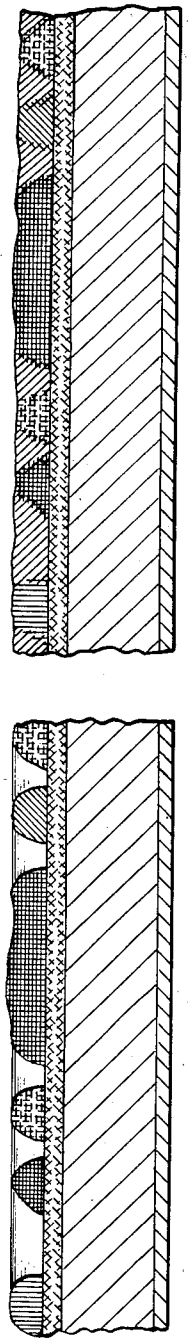


Fig. 3.

INVENTOR
BERNARD J. KELLY
BY Newell & Spencer
ATTORNEY

Patented Aug. 29, 1933 1,924,501

UNITED STATES PATENT OFFICE

1,924,501

PRINTING

Bernard J. Kelly, Philadelphia, Pa., assignor to Sloane-Blabon Corporation, Philadelphia, Pa., a corporation of Delaware

Application February 1, 1933. Serial No. 654,610

12 Claims. (Cl. 41—26)

This invention relates to a method of printing designs, and more particularly to the method of printing in which the details of the design are first applied to the base, and the background is then applied over the detail, as well as upon adjacent areas.

The invention is designed particularly for the production of novel decorative effects in printed floor coverings and the like, and accordingly will be described in connection with that use. It is to be understood, however, that the invention is not limited to this particular use, but may be applied generally, wherever designs are to be printed upon a surface with colors which are adapted to flow to a greater or less extent after being applied to the surface, whether such colors are inks, paints, varnishes, or any other type of surface coating material. The word "color" is used in this connection, of course, to include black and white, as well as the various hues, such as blue, green, yellow, etc.

Prior to my invention, designs which have been produced upon this class of goods have been made in one of two ways. In some cases, the design is printed by what is known as the cut-out method, in which case, the detail of the design,—that is, all of the colors which are to contrast or be distinguished in any way from the background, are printed each on its own area, without applying any color to other areas than those which are to exhibit that particular color in the finished article, and the background is applied in the same way, only to areas which are to exhibit the background color. When this method is adopted, it is necessary to cut out, at substantial expense, all of the blocks which are used for applying various colors, so that each has remaining only such printing area as corresponds to the area which is to be covered by the particular color in the finished design.

In the so-called overlay method, the background color is printed first, and is printed over the entire area on which the design is to be displayed, after which the detail colors are applied on top of the background color. This method saves the expense of cutting the block by which the background color is applied, and with some types of design produces a more desirable effect. The overlaid colors, however, are likely to be raised slightly above the level of the background, and therefore to be subjected to the greatest wear. Since these colors do not extend through the paint coating, but are largely carried on the surface of the background color, these details of the design are likely to be worn away before the material has served out its useful life. The use of masher blocks following the overlay printing has for many years been common practice, in order to blend, to some extent, the overlay colors into the background, and to level the surface so that the detail areas will not be subjected to such excessive wear, and the design may remain during the greater part of the life of the printed goods. Even the use of masher blocks in this way, however, does not result in extending the design entirely through the coating.

One advantage of the present invention is to provide a novel method of printing, by which the background color may be applied indiscriminately over the entire area to be covered by the design, but in which, when the article is completed, the design will extend completely through the coating, so that it cannot be worn away except as the coating is worn entirely through. Another object of the invention is to provide novel effects in which the colors of the design may be beautifully blended or may be made to exhibit endless variations from the exact outline of the applied design.

Although it is an important advantage of my invention that the blocks by which the ground color is applied do not have to be cut according to the detail of the design, and the fact that the design extends entirely through the coating is of even greater importance, probably the greatest advantage of my invention lies in the enormous possibilities for new decorative effects which have long been sought, but never have been possible of attainment by the known methods of printing. Thus, softly blended effects surpassing anything which could be produced either by cut-out or overlay printing are easily attained, and true marbelized effects can also be produced, in which the veining extends irregularly under the ground color, precisely as the veins disappear gradually beneath the surface of a marble, and numerous other novel effects and variations from existing decorative effects may be secured by the use of this invention.

In the accompanying drawing I have illustrated one example of the application of my invention to printing of felt base floor covering material.

Fig. 1 is a diagrammatic view showing the various print blocks which may be used in applying the colors to the base sheet;

Fig. 2 is a plan view of a portion of such sheet as it would appear in the portion of the printing machine corresponding to Fig. 1; and

Fig. 3 is a cross-section on an enlarged scale of a portion of the printed sheet.

In Fig. 1, I have indicated by the reference character 10 the first block by which certain portions of the detail of the design are applied to the base sheet. The second block 11, in this case also, is adapted to apply to detailed portions of the design. The third block 12 is a full block not cut away within the design area, and in the printing operation this block applies the ground color over the detail colors already applied by the blocks 10, 11, and the brush block 13 may be used, in this case, following the application of the ground color by the block 12. This brush block serves, by pressing its bristles into the paint coating, to draw the underlay color applied by the blocks 10 and 11 through the ground color applied by the block 12, bringing it to the surface, so that the detail of the design is developed in the finished article. This brush block, depending upon the stiffness of the bristles, may also serve to a greater or less extent to blend the detail colors with each other and/or with the ground color by its stippling action, as it is pressed against and withdrawn from the coating. Finally, in this case, a masher block 14 is provided which serves, by a light mashing operation, to smooth out any surface irregularities which might result from the brush-pressing operation. It will be apparent to those skilled in the art that in this diagrammatic illustration I have chosen a particularly simple problem, and that ordinarily more blocks will be required for producing the finished design. In some cases it may be desirable, after the ground color is applied, to apply in addition an overlay color in order to produce some different effect from that which will be produced by the underlay, and in some cases, instead of using a full block for applying the ground color, the ground color may be applied by a block which is cut out to leave areas for the application of other details by the cut-out method in order to produce certain decorative effects characteristic of the cut-out methods, in addition to those which are to be produced by the underlay method of the present invention, and it may, in some cases, be desirable to apply additional colors or various other steps after the brush-pressing and/or mashing, as for example, the application of lines more clearly to define and outline certain design areas, or to apply certain design details which it is desired to retain in sharp outline without the blending which would result from the brush pressing and/or mashing steps. These suggestions are, of course, not intended to be exhaustive, but merely as an indication of the unlimited variations to which the method of my present invention may be accommodated.

In Fig. 2, I have illustrated the effects produced at the various stages of the printing with the blocks illustrated in Fig. 1. At the first station 10*a*, certain lines of color are applied; at the second station 11*a*, additional lines of the second color are applied; at the station 12*a* these lines and the intervening areas are completely covered with the ground color. In the present case, however, the ground color is so related to the detail colors that the latter tend to bleed through to the surface even before the brush pressing, so that at the intermediate station 12*b*, these lines again appear through the surface of the ground color.

For certain types of design, this flowing through of the color first applied to the surface, or perhaps, more accurately, the flowing away of the surface color so as to expose the color first applied, will serve to give the desired decorative effect. In the case illustrated, however, it is desired to obtain a more softly blended effect than would be produced in this manner, and accordingly at the station 13*a* the coating is subjected to a brush-pressing. This brush-pressing serves, as more fully described in the co-pending application of myself and James W. Kemmler, Ser. No. 626,593, filed July 30, 1932, to softly blend and intermingle the colors at the borders of the detail areas, and I have found that using the brush-pressing process substantially as described in said co-pending application softer and more pleasing effects can be obtained with underlay printing as herein described than with either overlay or cut-out printing, as heretofore used.

In Fig. 3, I have shown a portion of the finished material in section to illustrate how the detail colors extend from top to bottom of the coating, and are smoothly blended at their lateral borders.

In the preferred practice of the invention as above described, the color as applied by the blocks 10 and 11 are colors having considerable tack, while the ground color applied by the block 12 is preferably shorter and of less tack than those applied by the blocks 10 and 11. Thus, for example, I may use colors ordinarily thought of as block colors for printing the detail on the blocks 10 and 11 and a color which would ordinarily be regarded as a line color for printing the ground on the block 12. The effects which are produced, and particularly the extent to which the underlay colors voluntarily appear at the surface may be considerably varied at will, according to the particular effects desired, by regulating the relative properties of these various colors. Ordinarily, however, I prefer to use for the ground color a paint which has no more tack and is no less short than the color used for the underlying detail, since otherwise the blocks tend to become choked with the paint.

As already suggested above, numerous changes can be made from the particular application of my invention, and the particular procedure outlined above. In some cases it may be desirable not to disturb the effect which is produced by the voluntary flow of the paints either to expose more or less completely the underlay detail, or to bring the underlay so close to the surface that it may appear through a translucent film of the ground color or largely blended with the ground color, and in this case the blocks 13 and 14 would, of course, be omitted. The brush pressing is given only as one illustration of a treatment which may be used to modify the effects as voluntarily produced by the paints applied according to the underlay method. According to the particular decorative effect which it is desired to produce, the paints may be blown out, e. g., as described and claimed in the co-pending application of Kemmler and Weigle, Ser. No. 639,776, filed October 27, 1932, or may be subjected merely to a mashing with a pin or line block; or a squashing treatment may be used to spread the colors laterally into more or less grotesque and irregular patterns by means of blocks having imperforate surfaces of substantial area. For example, sawed blocks in which the saw-cuts are spaced as much as a half-inch or more my be used to cause a squashing effect, and in this manner decorative effects may be produced in striking contrast to the softly blended effects resulting from the use of brush blocks with flexible bristles, and the more regular patterns resulting from the use of pin or line blocks having

relatively small width. Where a minimum distortion of the pattern is desired and a maximum drawing through of the detail color to the surface, we find that a stiff brush may be used, e. g., having spaced wire bristles, so that there is little or no flexing of the bristles, but merely a drawing of the detail color through to the surface. By the omission or choice of these or numerous other supplemental treatments, or any combination of them, an innumerable variety of decorative effects may be attained, in all of which the design will extend substantially throughout the entire depth of the coating, although it may vary in exact form as the coating is worn. I am aware that numerous other changes than those particularly enumerated may be made, and the underlay method of printing may be combined with numerous other expedients without departing from the spirit and scope of this invention.

I claim:

1. The method of printing which comprises applying color to limited design areas, applying a ground color thereon, and drawing the color of the design through the ground color by pressing closely spaced narrow projections through the ground color into the design color and withdrawing said projections while the colors are still wet.

2. The method of producing marbleized patterns which comprises applying color along irregular lines to simulate marble veining, applying a ground color thereover, and intermingling the colors irregularly at the borders of the veining lines.

3. The method of printing irregularly blended designs which comprises printing color on areas corresponding to the detail of said design, thereafter printing the ground color so that it overlies at least a part of the detail, and drawing color of said detail through the ground color.

4. The method as defined in claim 1, in which the design color is drawn through the ground color by means of a brush block, the bristles of which adhere to the color of said detail sufficiently to draw it back through the ground color.

5. The method of printing designs which extend throughout the depth of the printed coating which comprises first printing the detail of said design and thereafter printing the ground color thereover, the ground color having properties so related to those of the detail color that the latter bleeds through the former leaving the detail largely exposed.

6. The method as defined in claim 5, in which the painted coating is mashed while wet with a masher block to draw the detail color to the surface in such areas as may not have been fully exposed by the unaided flow of said ground color and detail color.

7. The method of printing a design which comprises printing detail of said design in one color and thereafter applying a ground color which is shorter and has considerably less tack than the color first applied in printing said detail, said ground color being applied over the detail color on areas which are to exhibit said detail as well as upon previously unprinted intervening areas.

8. The method of printing a design which comprises first applying color to areas which are to exhibit detail of the design and thereafter applying a ground color both upon areas already covered with the detail color and upon intervening and previously unprinted areas, and thereafter bringing the detail color to the surface in areas to which both colors have been applied.

9. The method of printing as defined in claim 8, in which the detail color is drawn through the ground color by means of a mashing block.

10. The method of printing as defined in claim 8, in which the detail color is drawn through and softly blended with the ground color by means of a brush block having flexible bristles.

11. The method of printing as defined in claim 8, in which the detail color is exposed by blowing the surface of the applied color while it is still wet and fluid.

12. The method of printing as defined in claim 8, in which the detail color is exposed irregularly by means of a squashing block.

BERNARD J. KELLY.