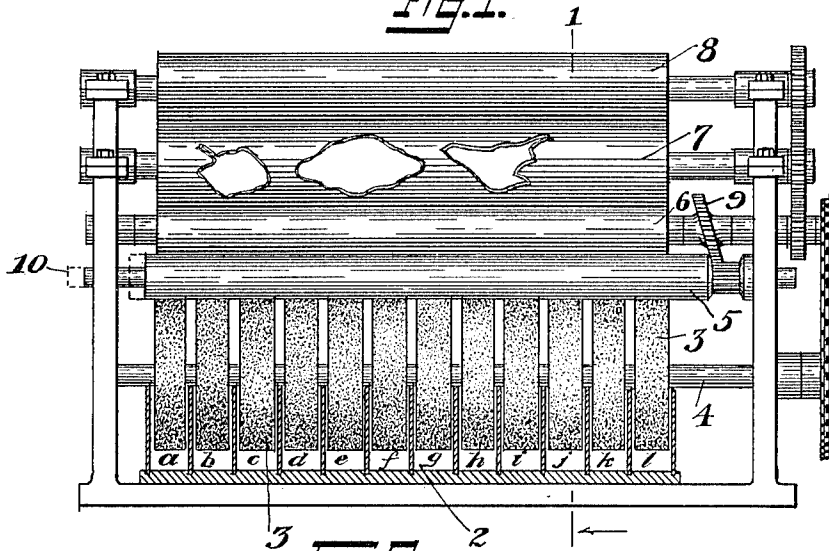


1,064,180.

Fig. 1.



102.

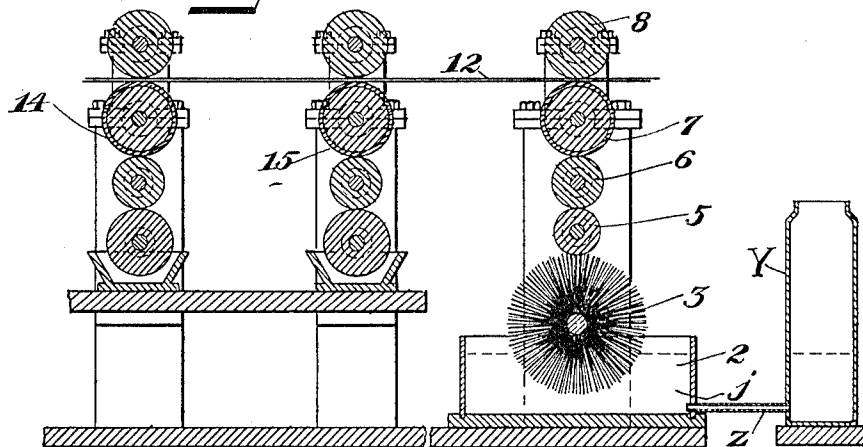
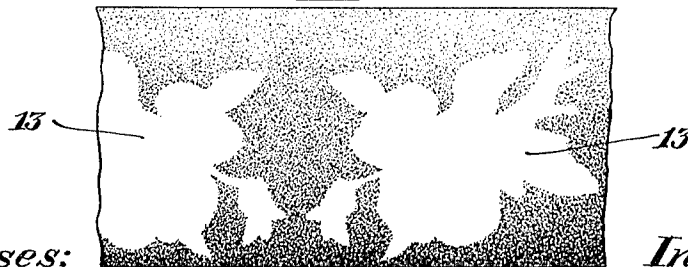


Fig. 3.



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UNITED STATES PATENT OFFICE.

JACOB SULZBACH, OF NEW YORK, N. Y.

UMBRA PRINTING DEVICE.

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Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, JACOB SULZBACH, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Umbra Printing Devices, of which the following is a specification.

My present invention relates to an improvement in a color transferring and blending device which may be utilized in printing or dyeing, and is more particularly intended for use in printing on long strips or ribbons of fabric, especially silk or satin fabrics of the class described.

By my above noted device, I am enabled to print or color a ribbon of the class described in a manner not heretofore attained and the resulting coloring is one of highly ornamental and pleasing effect.

This method of coloring comprises an arrangement of colors which, by means of the hereinafter described device, the said colors are arranged in zones or umbra effects, the said effects being continued in their predetermined arrangement the entire length of the fabric so treated. For instance, a certain pre-determined color, such as blue, may be so arranged upon the ribbon or strip as to be extremely dark at one side and graduated in shade to the opposite side of the strip to an extremely light tone of the same color without having any lines of demarcation between the various gradations of shades.

Another advantage in my device is that the color may be also made deeper at the center of the strip and gradually change to a light tone on opposite sides, or vice-versa.

Another advantage of my device is that a plurality of unlike primary colors may also be utilized, the said colors being so effectively blended upon the material treated, one color into another, as to produce a rainbow effect.

Any combination of colors or arrangement of depth of shade of color as regards the zonal arrangement and effects, may be pre-determined and utilized. It is evident from the foregoing that a wide variety of effects in coloring may be attained.

Another advantage in my device is that other ornamental or primary designs in various colors may be arranged upon the material or strip to be so treated, and the before noted zonal or umbra coloring be ar-

ranged upon the fabric in conjunction with the said designs, thereby forming a composite ornamental effect not heretofore attainable, and the various blended gradations of color will not be interfered with by the primary design as arranged. Any combination of color effects may be obtained to suit the eye and taste.

Another advantage in my construction, is that the various color fountains can be independently supplied with color from an independent source, which source may constantly be supplied with fresh color as the same is required, thereby obviating the necessity of stopping the machine during a long run of ribbon.

In the accompanying drawings, Figure 1 is a rear elevation of my machine. Fig. 2 is a sectional view of my machine, line 1—1, Fig. 1. Fig. 3 is a view of a portion of a strip of fabric showing diagrammatically one treatment of the varying density of color from one side of the fabric to the other.

By referring to Figs. 1 and 2 it will be seen that my device is comprised, mainly, of a plurality of color containers or fountains 2, in which are suspended a plurality of rotatable brush or like roller members 3, the same being suitably mounted upon a rotatable shaft 4. Above the said brush or roller members is arranged a distributing and blending roll 5, and in rolling contact with the said roll 5 is a transfer roll 6, which is in turn in rolling contact with a print roll 7, and arranged above the said roll 7 is a presser roll 8. It is obvious that certain rolls in this set may be dispensed with or other rolls may be added thereto without in the least acquiring any advantage in the method of blending the colors and applying the same in the blended condition to the fabric to be treated. Of the plurality of color fountains, generally denoted by 2, and of which, in the present case, there are 12, there may be arranged in compartment or container *a* a certain shade of color, such as a very deep blue, and the next compartment *b* may contain the same color of a lighter degree of shade, of about 8% or 10% variation. The remaining compartments, *c*, *d*, *e*, *f*, *g*, *h*, *i*, *j*, *k*, and *l*, may each contain a like amount of the coloring, each of the same being reduced in its progression the same percentage in shade. Upon rotation of the shaft 4 from any source of power, not

shown, the brushes 3 bring the color from the compartments, generally denoted by 2, and deposit the same upon the said vibrating distributing roll 5 which is in operative contact with the transfer roll 6. The transfer roll 6 may have arranged thereon a skew or cam gear 9 of the familiar type which is in mesh with the gear portion of the roll 5, and upon rotation of the entire mechanism the said roll 5 is caused to vibrate longitudinally in its bearings, as indicated by the dotted line 10. This longitudinal movement of roll 5 is enough to cause the different shades of color to over-lap one another and thereby be intermediately mixed or blended in such a manner as to overcome the progressive or step tones between the color lifting rolls 3 and thus overcome the line of demarcation that might otherwise occur. The colors are then carried after the manner of printing presses to the print roll 7, there to be transferred upon the material 12, Fig. 2, as it passes between the said presser roll 8 and the said print roll 7.

Where compound types of ornamental effects are desired, such as is indicated in Fig. 3 at 13 and 13, designs of two or more colors may be printed upon the ribbon, either before the umbra effect is applied as indicated in Fig. 2, or thereafter. If, for instance, a two color design, such as flowers, is printed upon the fabric, the general outline of which is indicated at 13, Fig. 3, an apparatus may be used, properly located for the registry of the succeeding impressions and as denoted generally by 14 and 15, for impressing these designs upon the fabric. After these designs are printed by the mechanism indicated at 14 and 15, the fabric 12 is then passed through the umbra coloring device.

The print or coloring rolls 7 may have cut thereon blank outlines of the preceding primary flower design, the said blank outlines having no color retaining surface within their limits, and therefore the umbra coloring effect will surround the said primary design, forming an effective back-ground therefor. It is obvious that the said blank outlines must rotatively register with the primary design already impressed upon the fabric, so that the umbra effect will not overlap. The registering means, however, are not shown and form no part of the present invention.

In Fig. 2 is shown a color supply vessel Y which has arranged thereon a supply tube Z which is connected to the color container *j*. Each of the other color containers in the group are also likewise equipped, and through these exteriorly arranged supply vessels the containers may be constantly supplied for a long run of ribbon.

The arrangement of my fountains and rolls, with the fountains beneath and co-acting with the fountain rolls, the blending roll in contact with the fountain rolls and a transfer roll interposed between the blending and print rolls, produces umbra effects of a delicacy and beauty not hitherto attained.

Having thus described my invention, I claim:—

1. An umbra printing machine comprising a plurality of color fountains and a series of successively co-acting revolubly-mounted rolls, said roll series comprising a plurality of fountain rolls, a blending roll, a transfer roll, a print roll and a presser roll, said rolls arranged substantially vertically and to contact in the above recited order, the fountain rolls adapted to severally revolve their lower limbs in said fountains, the blending roll adapted to be axially reciprocated, and means for revolving said rolls and axially reciprocating the blending roll.

2. An umbra printing machine comprising a plurality of color fountains, a like plurality of color reservoirs, and a series of successively co-acting revolubly-mounted rolls, said roll series comprising a plurality of fountain rolls, a blending roll, a transfer roll, a print roll and a presser roll, said rolls arranged substantially vertically and to contact in the above recited order, the fountain rolls adapted to severally revolve their lower limbs in said fountains, the blending roll adapted to be axially reciprocated, said color reservoirs severally connected with and adapted to maintain the supply of color in said fountains, and means for revolving said rolls and axially reciprocating the blending roll.

JACOB SULZBACH.

Witnesses:

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