Feb. 11, 1936. S. G. CLIFFORD 2,030,351

METHOD OF APPLYING PROTECTIVE COLORING IN THE PRINTING OF DOCUMENTS REPRESENTING VALUE

Filed Oct. 11, 1933 2 Sheets-Sheet 1

Fig. 1.

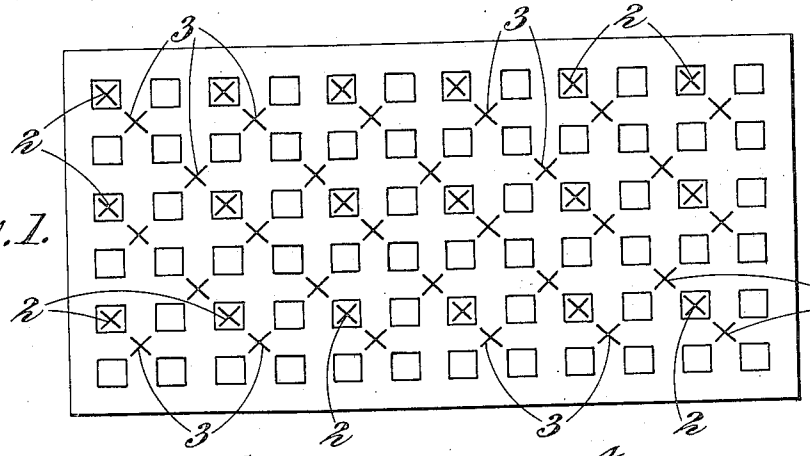


Fig. 2.

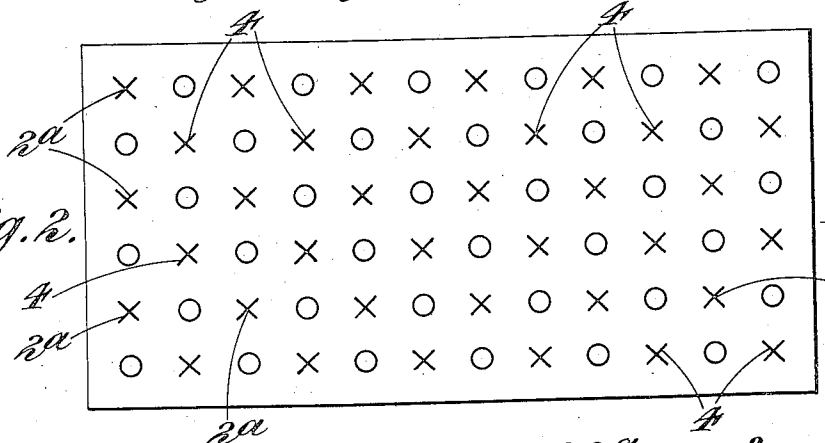
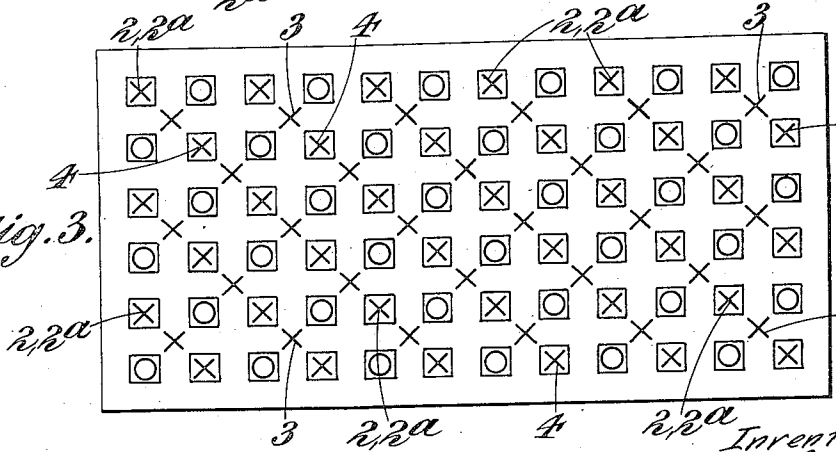


Fig. 3.



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Fig. 4.

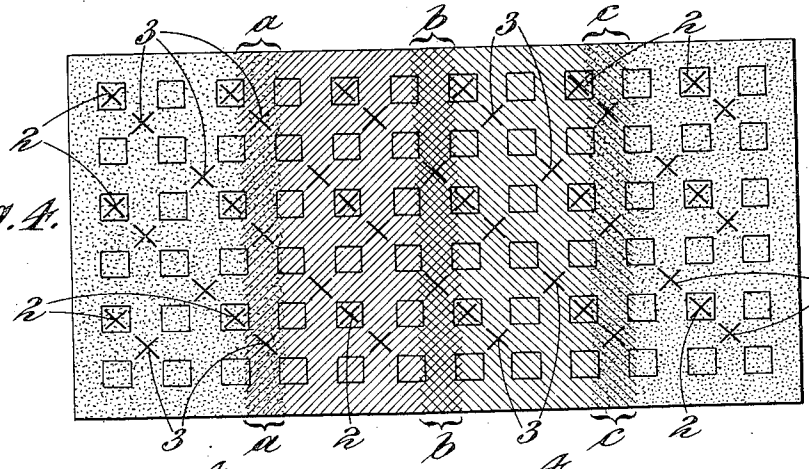


Fig. 5.

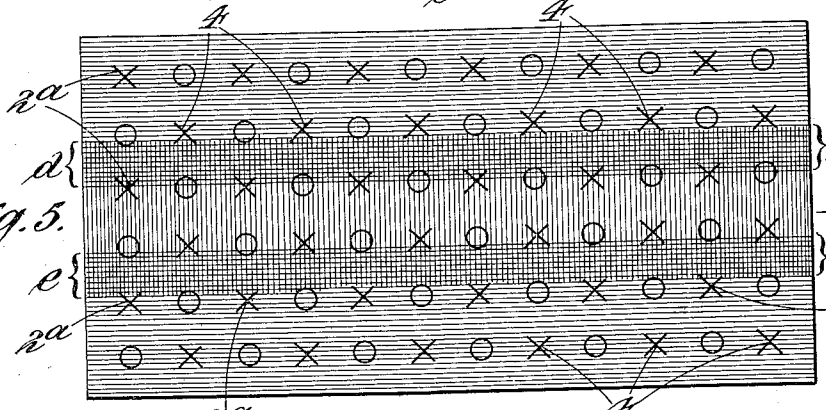
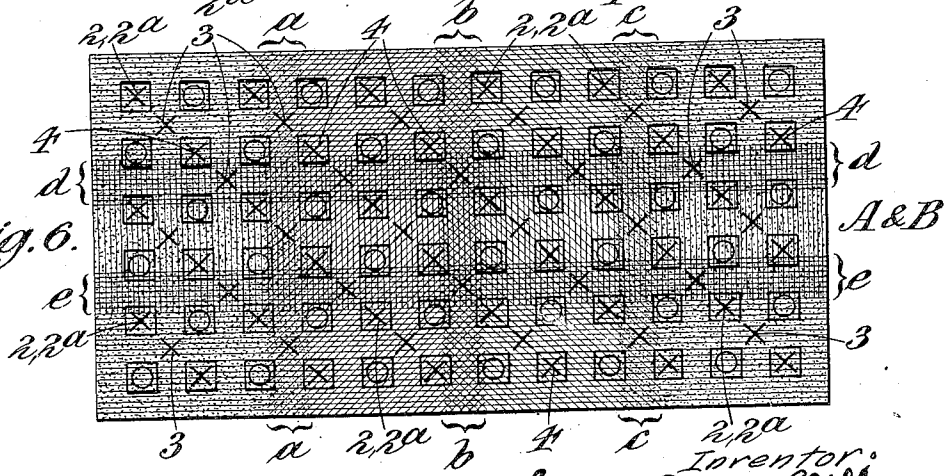


Fig. 6.



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Patented Feb. 11, 1936 2,030,351

UNITED STATES PATENT OFFICE

2,030,351

METHOD OF APPLYING PROTECTIVE COLORING IN THE PRINTING OF DOCUMENTS REPRESENTING VALUE

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Application October 11, 1933, Serial No. 693,179
In Great Britain October 31, 1932

3 Claims. (Cl. 101—211)

This inventon relates to an improved method of applying protective coloring in the printing of documents representing, or intended to represent, value, such, for example, as bonds, share warrants, bills, notes, cheques and the like and has for its object to render same as difficult of fraudulent reproduction as possible.

It has been customary to employ for this purpose one, or a combination of two or more colors, chosen to produce protective anti-photographic tints, that is to say tints which underlie the main printing of the document and are of such a color or nature that they cannot be photographically separated from the main printing for the purpose of making a fraudulent imitation of the document.

As an additional safeguard a somewhat intricate pattern has been employed, which is applied in a succession of two or more printings in close register, each printing being preferably a different color. By this means the two colors are brought into near spatial relationship and also a third color is produced where one color is imposed upon another.

In multi-color printing work, where the ink in the duct, leading to the roll which feeds the inking roller, is divided into separate colors, a merging of the bands of colors can be produced, regulated and determined by the amount of lateral oscillating movement of the inking mechanism, the result being to produce a "rainbow" effect.

According to this invention there is employed in the printing of a document, which is to be as fraud-proof as possible, the step consisting in twice passing the document through multi-color printing rolls, once in the direction of the length of the document and once transversely of its length, to produce a variegated effect.

The invention moreover embraces the method of printing a document consisting in applying thereto a pattern by a first printing operation employing two or more bands of colors merging at their edges, and subsequently applying thereto a further pattern by a second printing operation employing two or more bands of merging colors, the bands of colors in the respective operations running substantially at right angles to one another and the two patterns being in close register.

The invention also includes the method of applying protective colorings to documents consisting in subjecting the sheet of paper to two successive printing operations whereby the desired pattern is applied to the sheet by the two impressions in close register, each impression comprising two or more bands of colors merging at their edges, the bands of colors of the first impression running substantially at right angles to the bands of colors of the second impression.

One method of printing a document in accordance with the invention consists in applying a close register pattern to a sheet in two impressions, each formed by a printing block inked with two or more bands of colors merging at their edges, the sheet being turned at right angles when being passed through the machine for the second impression to the position it occupied when being passed through for the first impression.

The term "printing block" used in this specification is to be construed as meaning any printing element, such as a printing block or litho-plate.

Referring to the drawings filed herewith:—

Figs. 1, 2 and 3 illustrate an example of close register printing as commonly used,

Figs. 4, 5 and 6 illustrate one embodiment of this invention.

For the purpose of rendering the description clear, a simple pattern has been chosen to illustrate the process commonly known as "close register" printing. It will be assumed that the desired pattern is produced by two printings produced by two plates A and B.

Fig. 1 illustrates the impression on a sheet of paper made by plate A, the pattern consisting of a series of squares, a series of crosses 2 within the squares and a series of crosses 3 outside the squares.

Fig. 2 illustrates the impression which would be made by plate B on a sheet of paper, the pattern consisting of a series of circles, and a series of crosses 2^a and 4.

Assuming now that to a sheet shown in Fig. 1, a second impression in close register was made by plate B, the result would be the combined impression illustrated in Fig. 3. It will be observed that the crosses 2^a (Fig. 2) are superimposed on the crosses 2 (Fig. 1), whilst the crosses 3 lie between the squares and the circles all lie within the squares. This choice of two patterns which include some portions in common increases the range of color variation obtained in the final background design when different colors or groups of different colors are employed in the printing of the separate patterns.

If the first impression (Fig. 1) was made in blue and the second impression (Fig. 2) was made in close register with the first impression in yellow, the pattern would appear as follows; the squares and crosses 3 would be blue, the circles and crosses 4 would be yellow, whilst the crosses 2, 2^a would

appear green, being the compound color of blue and yellow.

Referring now to Figs. 4, 5 and 6, these illustrate one method of printing a background design in variegated colors upon a document in accordance with the invention, the distribution of the colors in the printed pattern being shown according to the heraldic convention.

Fig. 4 shows the impression produced on a sheet by plate A, where the ink in the duct is divided into four bands, namely, yellow, purple, green and yellow. By imparting an oscillating movement to the rollers feeding the ink to the inking roller a merging of the colors along the edges of these bands is brought about, thus producing a rainbow effect; this operation is commonly known as "rainbowing".

The merging or rainbow effect cannot be shown in black and white, but is diagrammatically illustrated by the brackets *aa*, *bb* and *cc*. It will be understood however that the merging or rainbow effect is a gradual one and that there is no hard and fast line of division between the bands of colors.

Fig. 5 shows the impression on a sheet of paper made by plate B using three bands of colors, namely, blue, red and blue, which are rainbowed as shown diagrammatically by the brackets *dd* and *ee*. In order to produce this sheet, the plate B must be mounted in the machine at right angles to the position in which plate A was mounted and moreover the sheet must be run through the machine in the direction of its length, whereas the sheet shown in Fig. 4 was run through the machine in a direction transverely of its length.

Assuming now that the sheet of paper shown in Fig. 4, which is produced by plate A, is run through the machine again in the direction of the length of the sheet and subjected to a second impression in close register by plate B the latter being mounted at right angles to the position in which plate A was mounted, the final result will be as shown in Fig. 6, thus producing a double rainbow effect, that is to say rainbowing in two directions at right angles to one another.

The pattern used in Figs. 4, 5 and 6 is identical with that employed in Figs. 1, 2 and 3 and moreover the same references are used to designate the characteristics of the pattern in all the figures.

Documents printed in accordance with this invention, not only present an attractive appearance, but render fraudulent reproduction very difficult. The actual effect obtained by printing a small pattern, in close register, is indicated in Fig. 6 although the limitations of a black and white showing of colored areas and lines make it impossible to present a true picture of the continuously variegated background effect produced by the superposed colored patterns obtained by passing the paper through the presses in directions at right angles to each other.

What I claim and desire to secure by Letters Patent is:—

1. In the process of printing a fraud-preventing background upon a document by printing thereon a plurality of partial patterns in different colors, the steps which comprise printing one partial pattern upon the document in bands of a plurality of colors, and printing upon the same area of the document a second partial design in bands of a plurality of colors which extend at a substantial angle to the said first color bands.

2. A process as claimed in claim 1, wherein said partial patterns have portions thereof in common.

3. A process as claimed in claim 1, wherein the said bands of a plurality of colors include bands of distinctive colors separated by bands of merging colors produced by a rainbowing of the adjacent distinctive colors.

4. In the process of printing a multicolor background design upon commercial paper, the method of producing a background design in continuously variegated colors which comprises printing each of a plurality of partial designs in a set of bands of distinctive colors separated by merging bands of the adjacent distinctive colors, the set of color bands of one partial design extending at a substantial angle to another set of color bands.

5. A process as claimed in claim 4, wherein the colors employed for one set of color bands include a color additional to any color present in the other set of color bands.

6. A process as claimed in claim 4, wherein the colors employed for one set of bands are different from all colors included in the other set of color bands.

7. A process as claimed in claim 4, wherein the colors employed for one set of bands are different from all colors included in the other set of color bands and said partial designs include portions in common and portions individual to the separate partial designs, thereby to increase the range of colors in which the background design is printed.

8. A sheet of paper for use in the printing of documents, said sheet of paper having a continuously variegated background color consisting of two partial background designs in close register, each partial design consisting of spaced pattern elements arranged in bands of different colors, and the bands of colors of the said partial designs extending at a substantial angle to each other.

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