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(54) PROTECTED DOCUMENTS

(71) We, BURROUGHS CORPORATION, a corporation of the State of Michigan, United States of America, of Burroughs Place, Detroit, Michigan 48232, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to protected documents.

The prior art has developed according to the references cited in U.S. Patent 3,802,724 issued April 9, 1974.

Prior art techniques, for the most part, have been based upon the utilization of competing chemical formulations which are or may be employed as either an overlay on the top surface of the document to be protected or as an overprinted area on such documents or in some instances as a chemical wash or bath into which the entire paper stock is immersed and from which the document is hereafter preprinted. None of the known techniques has direct application to computerized document protection nor are any of the known prior art systems readily adaptable to document protection of computer printouts as hereinafter described.

Improvements of U.S. Patent 3,802,724 related to a combined document using a document protection system for use with high speed data processing equipment such, for example, as high speed printers, which produce visibly legible records from a computer, the document being safeguarded by a pattern of legible warning data camouflaged by a pattern applied to a film covering of the warning data so that if the covering is altered, the warning data will appear.

Since the general quality of printing by such high speed computer printouts is usually fairly poor, it is a relatively easy matter for the document forger or check alterer to raise, change or remove and add the amount and/or signature at will. The same is generally true for the average typewritten document, check, etc. The printing on these materials is generally so inferior that alteration by hand of the amount or signature is accomplished with ease and efficiency by the individual.

The system contemplated in U.S. Patent 3,802,724 employs a high tensile strength, transparent material which is pre-cut in the form of a tape which is or may be produced in a relatively large roll. The transparent material is required to have a friction coefficient low enough to avoid marking by known means such, for example, as ball point pens, crayons and wax pencils. The tape is provided with a lightly colored camouflage pattern on one surface which is overcoated with a highly aggressive, pressure-sensitive, adhesive coating. The opposite surface of the transparent tape is coated with a curable colorless silicone resin. The document to which the pressure sensitized tape is to be applied is or may be provided with a lightly colored, so-called VOID pattern of repeating symbology such, for example, as the word "void", "fraud", "cancelled" or some similar designation. Thereafter the tape with the camouflage protective coating is adhesively secured over the area containing the void pattern, thus masking the "void" pattern from the eye while permitting any more darkly colored, printed indicia such, for example, as the number amount in the case of a check or the signature of the payer of the document to be visibly discernable through the tape. The document thus protected cannot be written upon in a protected area with the generally available writing instruments due to the slipperiness of the exposed surface. Attempts at complete or partial removal of the applied tape result in damage to the document, e.g. tearing, multilitation, holes in the protected area, etc.

Since the advent of quality color xerographic copiers, such as the Xerox 6500 color copier, copies of documents have posed an ever increasing problem.

The very effective system disclosed in U.S. Patent 3,802,724 can be thwarted by making a color copy of the original and then altering the amount.

In addition, because the systems of color copying are so effective, criminals having

access to them may effectively duplicate negotiable bonds, vehicle registrations and title to match them to the stolen vehicle, personal identification documents, and other documents. As the copier systems proliferate, so does their usage and the opportunity to make nefarious copies.

It is the principal object of this invention to thwart nefarious copies of documents.

Methods of performing the invention will now be described with reference to the accompanying diagrammatic drawings, in which:—

Fig. 1 is a greatly enlarged sectional view in side elevation of a document in the form of a conventional check;

Fig. 2 is a view of the portion of a camouflage pattern for use with the present invention;

Fig. 3 is an isometric view of the tape protecting layered adhesive assembly in conjunction with a document to be protected;

Fig. 4 is a top plan of a conventional check illustrating the "VOID" pattern arranged over the amount area of the check; and

Fig. 5 is a view similar to Fig. 4 illustrating the check protection tape applied over the amount area illustrating the complete camouflage of the "VOID" pattern while permitting the amount to be visible through the tape;

Fig. 6 is a representation of a preferred embodiment showing how a particular document appears after copying; and

Fig. 7 is a representation of an alternative embodiment again together with a representation of a copy thereof.

As is the case of the earlier patented disclosure, this invention is concerned with protection of negotiable instruments from the hazards of alteration by chemicals, mechanical cutting, pen and ink addition to amounts, and general erasure, obliteration, scuffing and other similar means of altering or changing numbers which have intrigued and frustrated engineers and laymen alike since the inception of the use of such instruments. Up until the present time the skillful forger or document alterer armed with a scant few chemicals and a reasonable amount of finger dexterity could alter, change, rearrange, or otherwise make over a negotiable document into an instrument whose amount and/or signature had been changed and thereafter pass such document into the commercial money or banking stream almost at will.

Detection of such alteration varies from impossible to ridiculously easy depending upon the skill of the forger. Protection against the known schemes has run the gamut from chemically compounding various papers on which the documents are to be preprinted to using special pens and inks, mechanical checkwriters, special presses, intricate, large type styles, involved chemical overlays which were applied to the document both before and after printing, and certain types of processes more or less related to the decalcomania art. The present invention in effect avoids the pitfalls of the prior art while providing an extremely high degree of protection against alterations and particularly against reproductions and alterations using color copiers.

Referring to the drawings and first to Fig. 1, there is shown a portion of a piece of document material, e.g. check paper, disproportionately enlarged so as to more clearly make discernible the various elements of the combination. The check paper 10 which may vary in thickness from .0035 to .007 inch may have printed on the facing surface 12 thereof a printed pattern 14, e.g. the word "VOID" repeated in multiple lines and this word or any similar mark may comprise the warning to at least the cognosenti that its appearance indicates alteration or forgery. A solvent insoluble substrate such, for example, as a polyester film base 16 on the order of .001 inch in thickness is preferably provided on one surface 18 thereof with a curable silicone resin plus catalyst coating 20 of .0005 to .00005 inch thickness. The opposite surface 22 of the polyester substrate 16 is provided with a printed, camouflage pattern 24 which pattern is printed directly on the film base; and, as will be seen later on herein, cooperates with the "VOID" pattern printed on the check in the same colour to completely hide or mask the void pattern. Over the surface of the printed camouflage pattern 24 there is applied a coating 26 of a high peel strength, aggressive, solvent and heat resistant, pressure sensitive, adhesive which is approximately .0008 to .0015 inch in thickness. The ink used to apply the VOID pattern is solvent insoluble; thus if the adhesive is dissolved away by a solvent, the pattern of the "VOID" becomes clearly visibly evident and immediately indicates the fraudulent alteration of the document. The camouflage wlil have a color density which is below the color reproductive threshold of the color copier and the warning mark is above the color density threshold of the color copier.

As can be seen from Fig. 1, the polyester substrate with its multiple layers of material is disposed with the adhesive coating adjacent the "VOID" pattern on the check paper.

Fig. 2 is illustrative of one type of camouflage pattern 24 which may be used with the "VOID" pattern 14. However, it is readily apparent that other patterns may be used provided the end result is that the "VOID" pattern printed on the check paper

is masked thereby so that the pattern is invisible to the unaided eye.

This camouflage may be mask marks in registry for the warning marks or a cover for the warning mark yet it will be of a density such that it is not a reproducible density so that it will no be copied when an attempt is made with a color copier.

Fig. 3 illustrates the manner in which the present invention can be employed to protect the amount area of a document, for example, a negotiable instrument such as a check. The layered structure as described in connection with Fig. 1 is produced in the form of a continuous tape or band 28 which may be loaded onto a supply reel and thereafter fed from the supply reel to the printing area of the high speed printer permitting a portion of the tape to be under cold pressure as by a roller and back-up anvil over the amount which has been printed in the amount area over the void pattern which is preprinted on the check structure.

An example of a check structure 10 bearing a preprinted "VOID" pattern 14 is shown in Fig. 4. This pattern could also be employed in the signature area 30 and the layered tape construction used in similar fashion to its use in the amount area.

Fig. 5 illustrates an example of the finally protected document, in this case a check 10, as it might appear with the protecting tape 28 adherred over the amount awaiting the signature of the payor with the "VOID" pattern camouflaged but with the amount clearly distinguishable therethrough.

The principal protection system of our invention employs a masked warning mark or phrase which when copied appears on the copy due to its effective color density being above the color reproductive threshold density of the copier. The mask is of a color density which is below the color reproductive density of the copier. Any overlay of the mask and the warning phrase has a color density exceeding the color reproductive threshold density. The color can be formulated from standard press inks.

The threshold density level for these colored inks is: Magenta $.12 \pm .01$; Cyan $.08 \pm .01$ and Yellow $.05 \pm 0.01$, as read by a Macbeth densitometer RD517. Formulations below these densities will not effectively reproduce on commercial xerographic color copiers such as the L-6500 even with pictorial screens such as 8R537 (Xerox). Densities above any of these levels will reproduce.

Thus in accordance with our preferred embodiment. as seen in Fig. 6, a warning mark "VOID" is laid down or printed at a density level below the aforementioned thresholds. This warning is overlaid with our mask which will be at a density below the aforementioned reproductive threshold densities. The composite density at those places where the warning mark is placed is in accordance with our invention above at least one of the aforementioned threshold levels.

Now it should be understood that this invention and its preferred embodiments are difficult to represent within the constraints of the Patent Office's pen and ink drawing requirements.

As illustrated in Fig. 6, the original document 601 has, at least a portion thereof (such as the amount or signature portion), the warning mark ("VOID" 602) printed in red. This is completely covered with a red camouflage 603 of a density below the aforesaid threshold density.

It will be understood that, as may be appreciated from seeing the drawings that the "VOID" mark is camouflaged before being copied. After it is copied, as shown in the Fig. 6 on the L-6500 colour copier, 604, the "VOID" mark will be reproduced because the composite density is higher at the point where the warning mark 602 appears.

While, due to the stylized representation in Fig. 6 a solid mark is contemplated, alternate marks can be made.

Representative of these alternate embodiments is Fig. 7. In Fig. 7 the document 701 has the warning mark 702 and camouflage 703 printed thereon. In this embodiment circles (which could be dots, squares or lines comprise the warning mark 702 and camouflage. The surrounding camouflage is below the color reproduction threshold density while the warning mark when overprinted with the registered camouflage, is of a density in excess of at least one of the threshold density limits.

In the preferred embodiment the "VOID" 602 will be printed with a color change ink solution. A sympathetic ink which turns or gains color and reproductive intensity when exposed to an eradicator is used in the marking mark. In the preferred embodiment, this ink is colorless and may be mixed with the other colored dies or pigments which form the color of the mark and also the mask. Examples of sympathetic inks which are "Chlorostain" or liquid (DuPont), "Chlorostain" N (DuPont), "Chlorostain" WH Liquid (DuPont), Oxochekh (Hilton-Davis).

If it is determined that the "VOID" pattern exists and an attempt is made to eradicate the pattern mark, as from the back of the check in Fig. 1—5, with for instance hypochloride bleach, the ink will darken indicating a forging attempt.

This color pattern will remain and be even more readily reproducible as being above the threshold level of the copies.

Fluorescent inks and other inks used in conjunction with the threshold level will raise the security of the system by a cumulative nature.

In summary we have described a document and a method of producing it which deters or prevents counterfeiting utilizing the Xerox L-6500 Color Copier or similar machines which possess different color sensitivity than the human eye. Pastels printed below a specified critical level (see above limits) will fail to appear in the copy, while those above the critical density will appear in the copy.

As a result of the described method of manufacture of the document the background overprint or pattern will drop out while the marking phrase or warning mark will be copied.

It should be understood that the above description is made by way of example and that various modifications and rearrangements will occur to those skilled in the art, both now and in the future, without departing from the scope of the claims.

Features of the invention hereinbefore described are claimed in Patent Specification No. 1599701 (Application No. 835/78) from which the present Specification is divided, and also in Patent Specification No. 1599704 (Application No. 8026415) also divided from the said Patent Specification.

WHAT WE CLAIM IS:—

1. A document having in at least one region thereof a background camouflage and a warning mark for deferring nefarious colour reproduction of the document, wherein said background camouflage and said warning mark are superimposed one on the other, wherein both said background camouflage and said warning mark are printed with a colour density less than the levels .08 Cyan, .12 Magenta and .05 Yellow, wherein the composite colour density of the warning mark and the background camouflage is above at least one of these levels, but wherein the warning mark is substantially indistinguishable from the background camouflage when viewed by the human eye.

2. A document according to Claim 1, wherein one or both of the background or warning mark contain ink which changes colour and increases its reproduction intensity when exposed to hydrochloride bleach.

3. A document according to any of the preceding Claims, wherein a fluorescent substance is applied with the warning mark.

4. A document as claimed in any of the proceeding Claims, wherein the warning mark and the background camouflage are printed with the same colour ink.

5. A document as claimed in Claim 4 wherein the warning mark and the background camouflage are printed with red ink.

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1599703 COMPLETE SPECIFICATION
4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

FIG. 1.

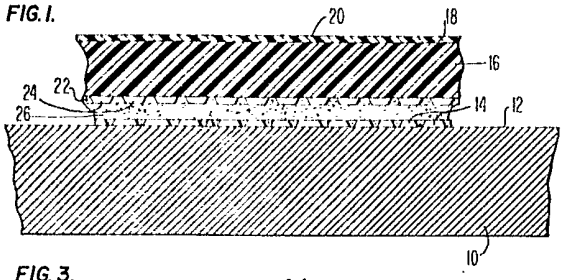

FIG. 3.

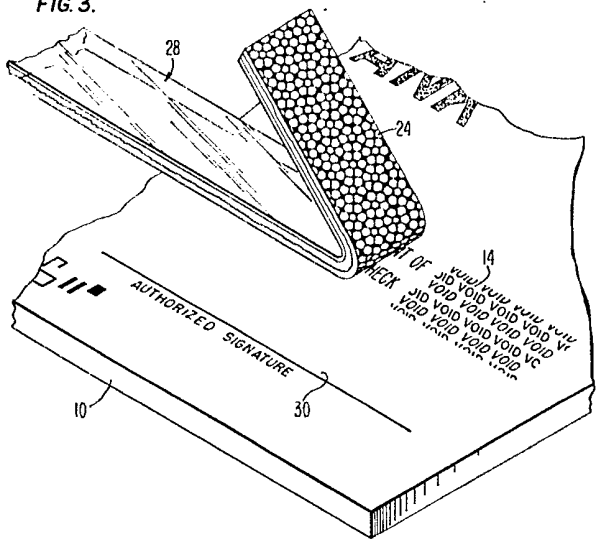

FIG. 2.

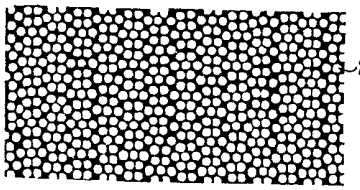

FIG. 4.

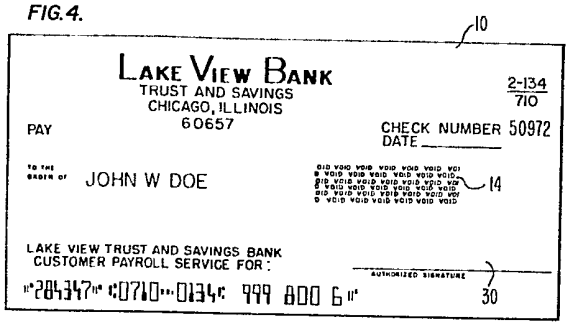

FIG. 5.

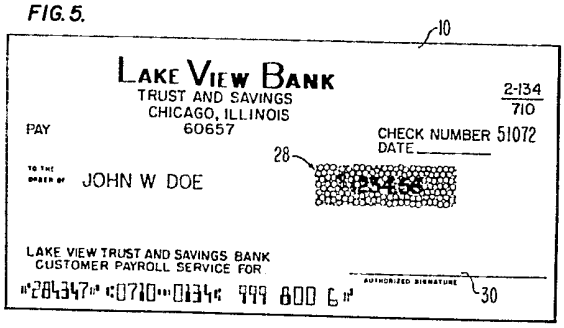

FIG. 6.

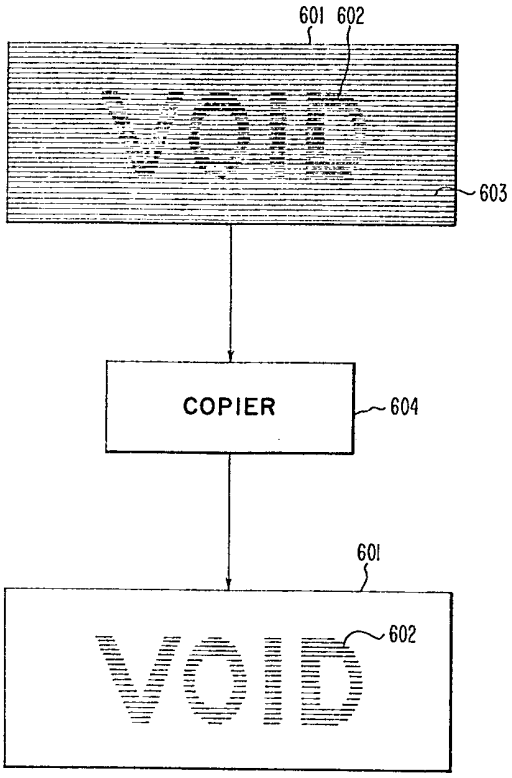

FIG.7.