Patented June 15, 1926. 1,589,210

UNITED STATES PATENT OFFICE.

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METHOD OF PROTECTING DOCUMENTS.

No Drawing. Application filed April 7, 1922. Serial No. 550,476.

The present invention relates to a new method of protecting documents, more particularly checks and similar instruments, against alteration.

It will be obvious to persons skilled in the art that the use of so-called fugitive inks is quite general for this purpose at the present time, these inks showing white whenever the printed paper is tampered with.

I have discovered that it is possible to introduce into the body of the paper a reagent which is normally invisible or may be masked, but which is sensitive to the ink eradicators employed for the purpose of removing the writing or printing ink from the surface of the paper. These ink eradicators, so-called, employ either an acid or a bleaching agent, or both, and according to my new method the substance contained within the body of the paper is sensitive to these reagents and upon application of the reagents to the paper a clearly visible colored substance is developed, which may be fast and capable of successfully resisting the action of organic solvents. In carrying out my new method, I impregnate or print the paper initially with a mixture of a primary amine, a developer and a nitrite, these reagents being imprinted upon or within the body of the paper according to any predetermined design and preferably masked in such a manner as to be substantially invisible. The paper may be first saturated with an aqueous solution of sodium nitrite and then dried. The dried paper is then treated with a solution of a developer and a primary amine in a suitable organic solvent. This subsequent treatment may be carried out either by impregnating or printing the paper with the solution. The character of the organic solvent will depend upon the nature of the developer and primary amine used and also the use to which the solution is to be put, that is whether it is to be employed for printing or impregnating the paper. In a typical case, such as described hereinafter, amyl-alcohol is a satisfactory solvent for impregnation and glycerin is a satisfactory solvent for printing.

If an ink eradicator is subsequently applied to such a paper for the purpose of erasing the written characters therefrom, the acid or the bleaching agent contained in the eradicator develops an intense color, which is substantially impossible to remove. The primary amine may preferably be one which oxidizes readily to a colored compound, thus increasing the sensitivity of the reaction when an ink eradicator is employed. Furthermore if such a treated paper is written or printed upon with acid ink, a permanent color is developed in the paper beneath the ink and becomes visible in the case of mechanical erasure.

As a specific example of reagents with which the paper may be initially impregnated, I may employ a mixture of dehydrothioparatoluidine, beta-naphthol and sodium nitrite. If an ink eradicator is subsequently applied to a paper containing this mixture of reagents, the acid of the eradicator reacts with the sodium nitrite to free nitrous acid, which in turn reacts with the dehydrothioparatoluidine to produce diazo-dehydrothioparatoluidine chloride, which in turn couples with the beta-naphthol to produce a bright red substance in the paper. If the paper is treated with an ink eradicator containing a bleaching solution, then a brown color is produced, the shade of which depends upon the conditions present. This brown color is due to the oxidation of the dehydrothioparatoluidine and to a considerably less extent to the oxidation of the beta-naphthol, the exact nature of this reaction being unknown. It will be seen that paper treated in this manner is sensitive both to the action of an acid or bleaching agent, these being the two substances commonly employed in ink eradicators.

It will be obvious that the reagents initially contained in the paper may be arranged in the form of a word, such as "void" for example, which are normally masked but will show prominently on the paper if the paper is subsequently treated with either an acid or a bleaching agent. In this connection it may be stated that ink eradicators commonly contain an organic acid, such as oxalic acid and a second reagent capable of liberating chlorine in its nascent state, such as sodium hypochlorite.

I claim:

1. A method of protecting documents

against alteration which consists in treating paper with a primary amine, a developer and a nitrite capable of liberating nitrous acid on treatment with an acid and forming a colored compound in and on the paper.

2. A method of protecting documents against alteration which consists in treating paper with a mixture of dehydrothioparaluidine, beta-naphthol and sodium nitrite which react with either an acid or bleaching agent to produce a clearly visible color in the paper.

3. A paper impregnated with a mixture of a primary amine, a developer and a nitrite arranged according to a predetermined design.

4. A paper impregnated with a mixture of dehydrothioparatoluidine, beta-naphthol and sodium nitrite arranged according to a predetermined design and capable of producing an intense color in the paper when treated with an acid or bleaching agent.

5. A paper treated with a primary amine, a developer and a nitrite capable of liberating nitrous acid on treatment with an acid, and forming a colored compound in and on the paper.

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