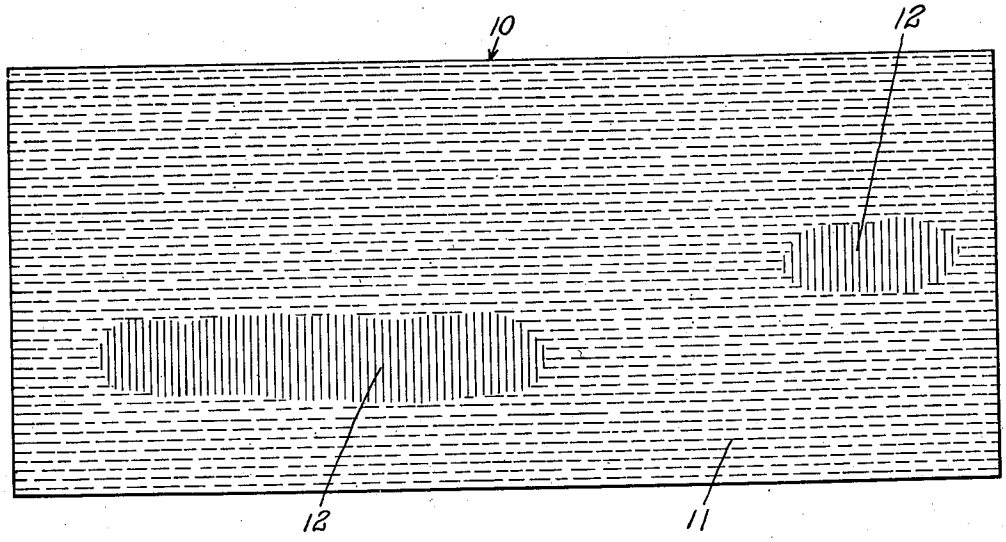
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PROTECTIVE PAPER AND INK THEREFOR

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PROTECTIVE PAPER AND INK THEREFOR

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This invention relates to a protective paper and ink therefor, and more particularly to a paper adapted to undergo a permanently identifiable reaction upon the application of ink eradicator or water thereto.

In the manufacture of checks, negotiable instruments, and similar materials, there have been devised many ways of preventing alteration of the instruments. Some means involve the application to the paper of a special design which is affected by any attempt at alteration. Other means include the printing of various layers of ink on the paper, often with one of the layers being printed in invisible ink, so that upon any attempt at alteration a predetermined design will appear on the paper.

Similarly, there have been many types of revenue stamps prepared which are very difficult to counterfeit. Various means for canceling these stamps to prevent reuse have also been provided. All of the means and methods devised, however, have had certain disadvantages, and most of them have been so complicated and expensive as to be impracticable.

With my improved product, the difficulties and complexities heretofore encountered are obviated.

Checks and similar instruments may be protected against alteration by merely printing on the surface thereof an ink, which, upon later attempted alteration of the instrument, becomes readily identifiable. A single layer of the ink is all that need be used in my protective paper. When alterations are atempted and ink eradicator or other bleaching agent is used, the portion of the paper which is tampered with permanently changes color.

The product may also be made sensitive to water alone. This type of paper may be used as a revenue stamp, and canceled by merely dipping the same in water.

Other features and advantages of my invention will appear from the following specification and drawing, which is a plan view of my protective paper, showing a portion of the paper upon which an alteration has been attempted.

The protective paper may include a paper base with a layer of ink printed thereon. The ink should contain a fugitive dye, which may be chemically reactive and may be bleached by the ordinary ink eradicator, and a pigment, which is chemically unreactive and is not appreciably affected by the eradicating chemicals. The ink eradicators normally act as oxidizing agents, and hence the dye should be readily oxidizable, while the pigment should only be difficultly oxidizable. However, since some eradicators are reducing agents and tend to bleach the dye by reducing it, the dye should also be capable of reduction, while the pigment should be difficult to reduce.

By a fugitive dye, I mean one which loses or changes its color upon the application of ink eradicator thereto.

The two coloring materials may be of different colors and may be blended together in the ink to produce an ink of a third color.

Thus the fugitive dye may be sensitive to ink eradicators, changing color or bleaching partially or completely when the eradicator is applied thereto. In addition, if desired, the dye may be sensitive to water when the same is applied to the printed material, being capable of being loosened from the paper fibers when wet, and thus being blotted or washed off the printed sheet by immersion in water. On the other hand, the dye, although sensitive to ink eradicators, may be such that the fibers in the paper are dyed to produce a print which is practically insensitive to water alone.

The pigment, which normally consists of chemically inactive coloring material, is substantially insensitive to both water and ink eradicators.

If the ink contains a blend of a pigment and a fugitive dye, of which the print is substantially insensitive to water but sensitive to ink eradicators, any attempt to alter the instrument by the applicaion of such eradicaor will cause the fugitive dye to lose its color. The color of the pigment will appear on the portion of the paper to which the eradicator has been applied. In effect, a striking and permanent change in the color of the printing has been effected.

If the fugitive dye in the print is sensitive to water as well as to ink eradicators, substantially the same result will be accomplished by treating the paper with water alone.

The ink may be of any suitable composition adapted to serve as a carrier for the pigment and dye. It is preferably suitable for printing on a lithographic press in which a high etched zinc plate is used. It may, however, be used with letter press, intaglio plate, or other type of printing.

The ink should contain suitable materials to provide body and printing properties. A material capable of swelling or being dispersed in water, with or without the use of chemical cutting agents, should be included. Examples of such materials are the natural and synthetic gums such as gum tragacanth, locust bean gum,

gum arabic, gum karaya, kelp, Irish moss, starch, modified starch, dextrine, methyl cellulose, and polyvinyl alcohol. None of these materials require the use of chemical cutting agents.

Other materials which may be used are protein substances such as animal glue, gelatine, milk casein, soy bean casein, and blood albumen. Of this group, milk casein and soy bean casein require cutting agents.

The printing material is dispersed in a suitable quantity of water, preferably in combination with a hygroscopic material, which prevents the evaporation of water on the press and eliminates danger of premature drying of ink. Among the hygroscopic materials which may be used are glycerine, glucose, sorbitol, ethylene glycol, and diethylene glycol.

If desired, a preservative such as phenol may be added to prevent bacterial growth.

The printing material in the water together with the hygroscopic substances and the preservative comprise a water extended vehicle for the coloring materials. By water extended vehicle, I mean a water base or water soluble vehicle as distinguished from an oil base vehicle.

The coloring materials, which include a blend of one or more dyes with a pigment or pigments, are dissolved or dispersed in the vehicle. Dyes may be selected from the well known groups of basic dyes, acid dyes, direct dyes, and spirit-soluble water-soluble dyes.

Among the dyes which have been found to be satisfactory are the following acid dyes:

Patent Blue
Fast Light Yellow
Milling Yellow
Milling Red
Alizarine Fast Blue

All of these dyes are sensitive to ink eradicators, and all of them, with the exception of Alizarine Fast Blue, are readily sensitive to water in the print. Alizarine Fast Blue is only slightly or partially sensitive to water in the print.

The dry color or pigment may include such substances as:

Lithol Rubine Red
Milori Blue
Hansa Yellow

A specific example of an ink which is sensitive to both water and ink eradicators comprises approximately 86% of a vehicle of White Corn Dextrine mixed with water, glycerine, and phenol in suitable proportions to obtain the proper consistency and coloring materials in the amount of approximately 14% by weight.

The 14% coloring materials may be made of the following substances:

	Per cent
Patent Blue (dye)	2.9
Lithol Rubine Red (pigment)	9.6
Hansa Yellow (pigment)	1.4

The dextrine and water are cooked together in the usual manner. Glycerine and phenol are then incorporated in the mixture. The dyes and pigments are then added and ground on a roller ink mill until the mixture is uniform.

Lithographic prints made from this ink are bluish gray in color. The prints are sensitive to both water and ink eradicators, and after treatment with either leave a permanent red blot on the portion of the paper which has been treated.

Thus as seen in the drawing, a paper base 10, carrying a layer of the ink 11 of the surface thereof, has an exposed portion 12 which is red in color, showing where the eradicator has been applied to the paper.

When a water sensitive fugitive dye is included in the ink, and the protective paper produced thereby is used as a revenue stamp, the stamp may be canceled by merely dipping the same in water. In this event, the water sensitive dye is dissolved by the water and bleeds out, leaving the dry color or pigment. Accordingly, the color of the stamp is changed from the original blend provided by the dye and the pigment to the color of the pigment alone, effectively canceling the stamp.

When the protective paper is provided with an ink color containing a blend of a dye sensitive to ink eradicators and a pigment, the prints may be identified as genuine by the application of an eradicator or specific chemicals. Even more important is the fact that any attempted alterations become apparent immediately upon treatment with the ink eradicator.

The foregoing specific examples have been given for the purpose of illustrating the invention and means of practicing it. Changes and modifications may, therefore, be made in the product as set forth, particularly as to nature and quantities of the ingredients used, without departing from the spirit and scope of my invention as set forth in the appended claims, in which it is intended to claim all novelty inherent in the invention as broadly as permissible in view of the prior art.

I claim:

1. An ink of the character described adapted to be applied to a paper base to form a protective paper providing a permanently identifiable reaction upon the application of ink eradicator thereto, comprising a water-soluble vehicle, a fugitive dye of one chromatic color dissolved in said vehicle, and a pigment of another chromatic color dispersed in the vehicle but substantially insoluble therein, said dye and said pigment being blended together to produce in the ink a third chromatic color.

2. An ink of the character described adapted to be applied to a paper base to form a revenue stamp capable of being cancelled by the application of water thereto, comprising a water-soluble vehicle, a water-soluble yellow fugitive dye dissolved in said vehicle, and a red pigment dispersed in said vehicle but substantially insoluble therein, said dye and said pigment being blended together to provide an ink of a color different from that of each of the constituents thereof.

3. A protective paper adapted to undergo a permanently identifiable reaction upon the application of an ink eradicator thereto, comprising a paper base, a water-soluble vehicle on said base, a fugitive dye of one chromatic color dissolved in said vehicle, and a pigment of another chromatic color dispersed in said vehicle but substantially insoluble therein, said dye and said pigment being blended together to produce in the ink a third chromatic color.

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