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J. W. NEFF

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SAFETY PAPER

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Fig. 1.

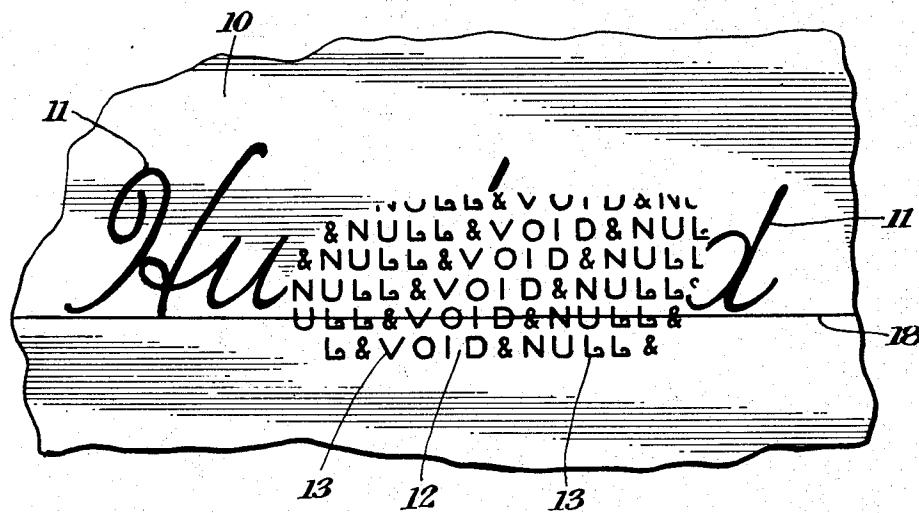
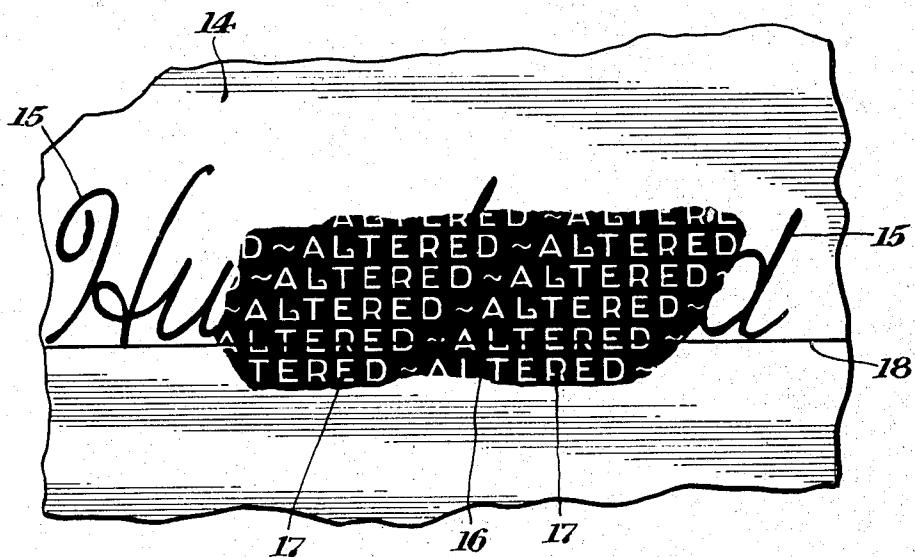


Fig. 2.



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SAFETY PAPER

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6 Claims. (Cl. 91—67.95)

This invention relates to safety paper and more particularly to a safety paper for checks, commercial paper, bonds, and the like.

Safety paper having incorporated therein or otherwise utilizing colored chemical substances or materials capable of developing a color change on the paper in reaction with oxidizing or bleaching agents customarily employed in ink eradicators has been known in the prior art. Such paper, however, is subject to certain disadvantages, chief among which is that the use of the colored chemical material, when applied as a printing, necessitates a colored surface design or camouflage overprint on the paper, whereas many users of safety paper require or prefer such paper with a white or substantially white surface. It has been proposed to substitute for the initially colored chemical material a colorless material similarly capable of developing color in reaction with bleaching or oxidizing agents, and which, when applied to the paper and prior to color change, is not discernible thereon. In many instances, the substitute materials as suggested, when sufficiently sensitive to develop color change and sufficiently stable as to retain their colorless properties over long periods of time, are unduly expensive, and further require painstaking effort and care in their preparation and incorporation with or on the paper.

One of the objects of this invention is the preparation of a safety paper containing or having applied thereto certain materials which undergo color changes upon the application of ink eradicators and analogous materials. A further object is the preparation of a safety paper of the above character utilizing a relatively inexpensive material which is of an inherently colored nature, but when applied to the paper thinly or lightly, is substantially colorless and not discernible thereon, while at the same time possessing sufficient sensitivity to bleaches and like substances.

Further objects and advantages will be in part obvious and in part indicated from the following analysis of the invention, it being understood, however, that various changes may be made therein by those skilled in the art without departing from the scope and spirit of this invention.

According to one mode of carrying out the invention, I propose, in making safety paper, to utilize chemical substances or materials which are inherently colored, but which possess a color of an intensity such that when applied lightly or in weak solution or suspension to the paper, their presence thereon is not readily discernible. While the desired materials may be applied to

the paper by incorporating or introducing them into the pulp materials from which the paper is to be made, or by application of these color forming materials to the paper after the same has been formed into the paper web as a coating thereon, I prefer to apply them to the paper in the form of a printing thereon, such printing being that of warning or voiding indicia or signs, such as the words "Null and void", "Forger", or "Altered", or a danger semaphore, etc., and in direct printing form, or the reverse thereof, generally known an intaglio printing.

In preparing my improved material for printing on the paper, I make the same into an ink which is suitable for use on lithographic or regular printing press work, and thereafter print the warning word or insignia on the paper, either in direct or reverse print. Upon application of an oxidizing or bleaching agent to the paper with the intent to alter the same, the normally invisible ink develops a conspicuous color, and the warning matter, or the field thereof, is rendered visible and legible against or in contrast with the unprinted areas of the paper.

In the drawing—

Fig. 1 shows a portion of a sheet of safety paper, made in accordance with the invention, showing the effect produced by application of an oxidizing or bleaching agent to a part of said sheet, the warning indicia being in direct printing.

Fig. 2 shows a portion of a sheet of safety paper, made in accordance with the invention, showing the effect produced by application of an oxidizing or bleaching agent to a part of said sheet, the warning indicia being in reverse or intaglio printing.

As one example of my ink, I may employ an inherently colored organic chemical such as dehydro-thiopara-toluidine, which is yellow in color, or in lieu thereof an inorganic chemical such as cobalt ferro-cyanide, which is greenish gray in color. Either of these or equivalent materials is mixed in a crystal varnish medium of a light consistency such as No. 1, No. 0, No. 00 varnish. The proportion of the chemical material to the varnish is substantially one part of the chemical material to three parts of the varnish by weight. Using the above described ink, the voiding words or insignia are printed on the paper by the dry process with high etched plates on a lithographic press, or on a regular printing press.

In the ink above described, the colored chemical becomes substantially transparent to the extent that its color loses its opaque characteristic.

and when lightly applied on the paper is not discernible thereon.

It will be understood that other colored materials may be used in place of dehydro-thio-para-toluidine, or cobalt ferro-cyanide, and all such materials which are initially colored but which possess color of such intensity that when applied to the paper, thinly or lightly, appear colorless or substantially so, are intended to be included within the scope of the present invention.

In Figure 1 there is shown a portion of a negotiable instrument made on the safety paper of the present invention, illustrating the manner in which the warning indicia serves to void the instrument when the instrument has been attacked with ink eradicating or other equivalent agents. In this figure, which is shown to illustrate one form only of the invention, the entire surface 10 is understood to be uniformly printed with a suitable warning indicia 13 in direct printing such as the words "Null and void", using the ink above described. These warning indicia, while the paper is in normal use, are substantially invisible everywhere thereon. The paper may also have printed thereon the ordinary guide lines 18 of a check, bond, or the like, and in normal use may have written or printed thereon the desired words or figures 11 in fountain-pen or other ink which is subject to eradication by means of oxidizing or bleaching agents. When an attempt is made to remove the eradicable writing 11 by an oxidizing or bleaching fluid, this fluid will cause the ink with which the warning indicia is printed at that part of the paper to deepen in color, thereby making the warning indicia 13 visible and legible wherever such fluid is applied to the paper. It will be understood that the area designated generally by the reference numeral 12 is the area to which the oxidizing or bleaching fluid has been applied, and that it is throughout this area that the warning indicia becomes visible.

In Figure 2 there is shown a safety paper 14 on which the warning indicia 14 has been applied in indirect or intaglio print. In this form of the invention, warning indicia 17 are printed in reverse or intaglio print against a background 16 formed of the ink hereinabove described. In this case the word "Altered" serves as the warning indicia. When an ink eradicating fluid is applied to the paper in an effort to remove written words or figures 15 thereon, the area 16 to which such agent is applied becomes deeper in color and the warning indicia 17 becomes visible by contrast therewith.

It will be understood that the warning indicia

may be applied to all parts of the paper, or only to such parts thereof as are likely to be attacked with ink eradicating or other similar fluids or agents. It will also be understood that in the forms of the invention shown for purposes of illustration in Figures 1 and 2, the warning indicia is applied uniformly to all parts of the paper 10, 14 shown, but becomes visible only within those areas or parts 12, 16 to which an oxidizing or bleaching fluid or agent has been applied.

The ink above described may be applied to a plain white paper so as to be substantially non-discriminable and colorless thereon, and may also, according to the present invention, be applied as a printing or a coating over a colored paper surface, and/or ornamental or surface design individual to a safety paper manufacturer, without discernment of the same. The ink when so prepared and applied responds to the application of bleaches and analogous materials by developing a conspicuous color.

It will be seen that the several objects of the invention are achieved and other advantageous results attained. As many changes could be made in carrying out the above invention, without departing from the scope thereof, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A safety paper carrying cobalt ferro-cyanide.
2. A safety paper carrying cobalt ferro-cyanide in such density as to render the normal color of said substance substantially non-discriminable.
3. A safety paper having a light surface application comprising cobalt ferro-cyanide.
4. A safety paper having a light surface application comprising cobalt ferro-cyanide mixed with crystal varnish of light consistency.
5. A safety paper having printed thereon symbols which, when rendered visible, convey a warning that the paper has been tampered with, said symbols being printed in an ink containing cobalt ferro-cyanide and a sufficient proportion of a suitable colorless vehicle to make said symbols normally substantially invisible.
6. A safety paper having applied thereto in reverse print symbols which, when rendered visible and legible, convey a warning that the paper has been tampered with, said reverse print being against a background of a normally substantially invisible ink containing cobalt ferro-cyanide and a sufficient proportion of a suitable colorless vehicle to make said background normally substantially invisible.

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