Aug. 4, 1931. B. W. SMITH 1,817,171

SAFETY PAPER

Filed Feb. 20, 1924

S MOTOR CAR CO. No.

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Fig.-1

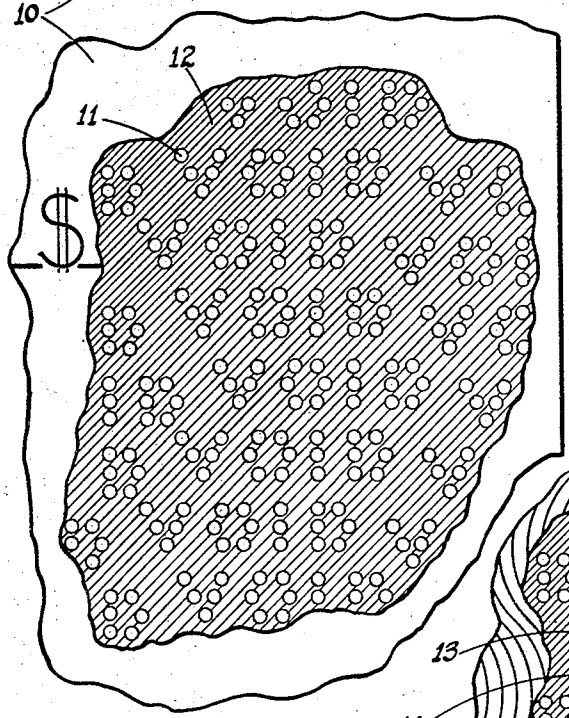


Fig.-2

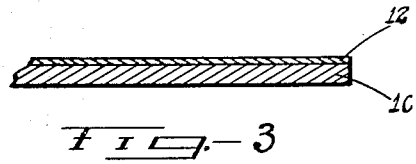


Fig.-3

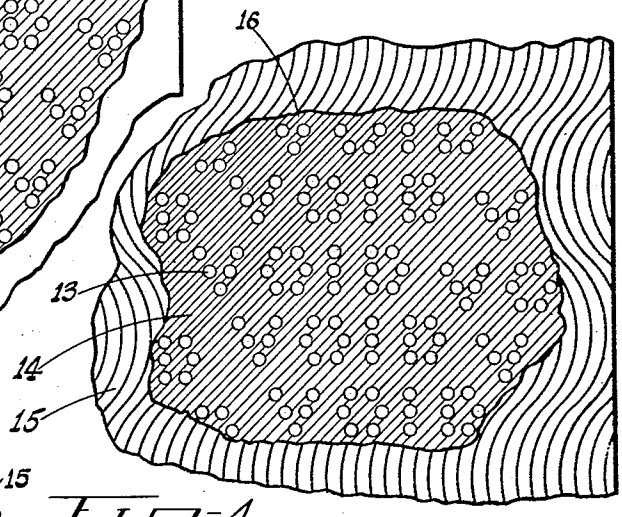


Fig.-4

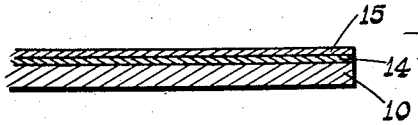


Fig.-5

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1,817,171

UNITED STATES PATENT OFFICE

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SAFETY PAPER

Application filed February 20, 1924. Serial No. 694,040.

This invention relates to safety paper for checks, drafts, bonds, and other commercial paper instruments, having as its chief object the provision of an advantageous paper of this character of a comparatively simple nature economical to produce and applicable to a wide range of conditions and requirements. More specifically stated, it is an object of the present invention to provide a paper of the above character having an inherently warning character applied thereto in an initially invisible manner but adapted to be rendered conspicuous by reaction with eradicating agents, such as the bleaching fluids in common use for making erasures, to thereby afford, for example, a white or plain paper, or one having any preferred pattern or other impression on it.

To these and other ends the invention resides in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 shows a check made of safety paper having the present invention applied thereto and illustrating the results of an attempted chemical erasure.

Fig. 2 is an enlarged fragmentary view of the portion of Fig. 1 illustrating the attempted erasure.

Fig. 3 is an enlarged sectional view of the paper.

Fig. 4 is a view similar to Fig. 2 but showing a modified form of application, and

Fig. 5 is a sectional view similar to Figure 3, but illustrating the modification of Fig. 4.

Similar reference numerals throughout the several views indicate the same parts.

The present invention is in the nature of an improvement upon the inventions disclosed in my Letters Patent No. 1,454,837, dated May 8, 1923, for Safety paper and method of making same, and in my Letters Patent No. 1,675,769, dated July 3, 1928, for Protective papers and methods of making same, which relate to the use of a warning character for the paper, camouflaged and thus rendered inconspicuous by an additional suitable impression. The present invention on the other hand affords a safety paper provided with warning means requiring no camouflaging or additional concealing matter and is therefore adapted for the production of safety paper having a white or plain surface, or one marked with a particular pattern or other impression not adapted to serve as camouflaging. This invention comprises, more specifically, the printing of the warning means in an invisible manner, and with indelible and initially invisible ink, adapted to react with and to be rendered conspicuously visible by eradicating reagents applied to the paper for making an erasure.

The warning means may take the form of any suitable character or symbol provided it is of such a nature as to be generally recognized as expressing a warning meaning. While various marks, signs and words are available for this purpose, it is preferred to use the word, "Void", because of its generally recognized significance, and this word is preferably printed in repetition over the entire paper 10, as indicated in the drawings, or at least over such portions of a check or other instruments made therefrom as it is particularly desirable to protect. Preferably also, the word is printed in relatively small size and in closely repeated arrangements to protect even such small portions of the paper as are usually occupied, for example, by the inscription of the amount in figures.

The warning character is furthermore preferably printed in a colorless, ink, as more fully described below, and in such a manner as to reduce any tendency to be visible in certain lights and positions, resulting from the effect of the ink on the light reflecting action of the paper. This may be accomplished to a degree by the use of fine lines employed, for example, for printing merely the outlines of a character or the letters of a word. It is preferred, however, to accomplish this result by breaking up the continuity of the lines such as form the letters of the word, into a multiplicity of substantially isolated areas, spots or dots. Such areas are preferably formed as circular dots,

as shown at 11, Figure 2, which have been found to lend themselves advantageously to the desired result of reducing visibility of differential light reflection.

As an additional step counteracting any tendency toward visibility, it is preferred also to stagger the warning character or words as repeated on the paper, in such a way as to avoid positioning the same in continuous alignment for any substantial distance and thereby avoid continuous line effects which might otherwise result. Such staggered arrangements of the words, as shown, for example, in Figs. 1 and 2, serves to prevent any continuous alignments of the line sections or dots and affords a commingled arrangement of the same which counteracts visibility, particularly on paper having a slightly rough surface, such as it is preferred to use.

The desired results may be obtained by the use of various inks having the desired initial invisibility, combined with the qualities of indelibility and of sensitiveness under the action of ink eradicating chemicals. It is preferred to employ an ink of an initially colorless character such, for example, as one containing manganese ferrocyanide, tolidine hydrochloride, or benzidine sulphate, used as a medium with oil varnish, or with a water varnish having for its base glycerine and gum arabic. To this may be added a small quantity of oxide of zinc, or zinc white, since these organic substances, in common with other organic compounds, are affected by the action of light corresponding to the lower invisible part of the spectrum which part is almost totally absorbed by the zinc white which thus serves as an effective protective medium against this influence for rendering the ink stable. These substances react effectively with ink eradicating chemicals generally such, for example, as bleaching reagents, and develop conspicuous colors of an indelible character so that characters printed therewith are thus rendered conspicuously visible.

As a further means for insuring invisibility of the impression as initially printed, use is made of the fact that characters printed in a negative form of impression are less visible than when printed positively, because of the trained aptitude of the normal eye for seeing positive impressions. That is to say, instead of printing the line sections or dots on a blank or unprinted background, it has been found advantageous to form these elements as unprinted surface portions 11, on a printed ground 12, Figure 2, where the lining is intended to denote color, and the circles about the dots 11 are conventional merely. The result is that the major portion of the paper surface has the ink applied thereto and such differences as exist in the light reflecting actions of unprinted and printed surfaces, render the latter the darker of the two, so that the characters themselves have a reversed or negative form of impression less easily discerned by the eye than if darker than the background. This negative form of impression has the further advantage of producing the development of indelible color over a major portion of the surface to which an eradicator is applied, so that a striking result is obtained.

An impression of the warning matter as above described may be made on plain paper and be invisible in any light at any angle of reflection and thus provides an effectively protected paper which may be very light in tint or even white, as frequently preferred by reason, for example, of the distinct legibility which is afforded for matter written or printed thereon.

The invention may also be applied if desired to paper having any preferred characteristic pattern or color since the warning means, being invisible, requires no assistance from an additional printing to obscure it. Such a modification is illustrated in Figs. 4 and 5, in which the warning word, "Void", shown at 13, is applied by the impression of invisible ink 14 as already described to paper having an additional impression of a simple, arbitrary lined pattern 15 as shown. The latter is preferably printed with fugitive ink removed by the eradicator as indicated at the locality of application thereof, 16. The use of such a pattern, especially if printed lightly on the surface of the paper, serves as a protection against erasure by abrasive treatment, since it is removed at the locality of such treatment leaving a surface contrasting with adjacent portions to warn of alteration. The paper employed may furthermore be of the known variety containing a chemical adapted to develop a stain or color contrast at portions to which chemical eradicators are applied, as well understood in the art, to increase the conspicuousness with which alterations are shown, as an additional protective step. The invention is thus applicable to paper having any color or pattern and provides a safety paper all portions of which are protected by an indelible and effective warning character which may be economically applied by a single printing impression.

I claim as my invention:

1. A safety paper having an inherently warning character formed thereon as an unprinted surface portion on a ground printed in ink of an indelible and initially invisible character adapted to react with and to be rendered conspicuously visible by eradicating fluids applied to the paper.

2. A safety paper having an inherently warning character repeatedly marked thereon by lines broken up into substantially iso-

lated areas formed as unprinted surface portions on a ground printed in ink of an indelible and initially invisible character adapted to react with and to be rendered conspicuously visible by eradicating fluids applied to the paper.

3. A safety paper having a word expressing a warning repeatedly marked thereon in staggered arrangement with the lines of the letters of said word broken up into substantially isolated and commingled areas formed as unprinted surface portions on a ground printed in indelible and initially colorless ink adapted to be acted upon and rendered conspicuously visible by an eradicating fluid applied to the paper for making an erasure.

4. A safety paper comprising a background formed by ink of an initially substantially invisible but sensitive character, said ground surrounding inherently warning indicia and being adapted to react with and to be conspicuously altered in color by an ink eradicating fluid, relative to said warning indicia, to indicate an attempted erasure.

5. A safety paper comprising a background formed by ink of an initially substantially invisible but sensitive and indelible character, said ground surrounding inherently warning indicia repeated thereover and being adapted to react with an eradicating fluid to produce a color for said background different from that of said indicia, to render said indicia visible and to conspicuously stain said paper over a major portion of the area affected by said eradicating fluid.

6. The method of making safety paper which consists in applying to the paper a colorless chemical solution, which is visibly reactive to eradicating agents, in such manner as to form a background for warning indicia appearing in reverse print against said background, which indicia when the background is rendered visible would inherently nullify the paper.

7. A safety paper carrying indicia thereon in reverse print against a background of a normally invisible chemical compound which is visibly reactive to eradicating agents, the indicia comprising a word or words which, when read against the visible background would inherently nullify the paper.

8. A safety paper carrying warning indicia thereon in reverse print against an impressed background of a normally colorless chemical compound which is visibly reactive to eradicating agents.

BURGESS W. SMITH.