Feb. 5, 1957 N. WHITEHEAD 2,780,015

TAMPER REVEALING IDENTIFICATION CARD

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Fig. 1.

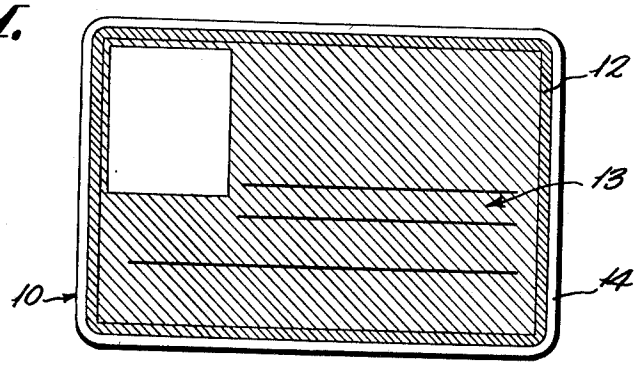


Fig. 2.

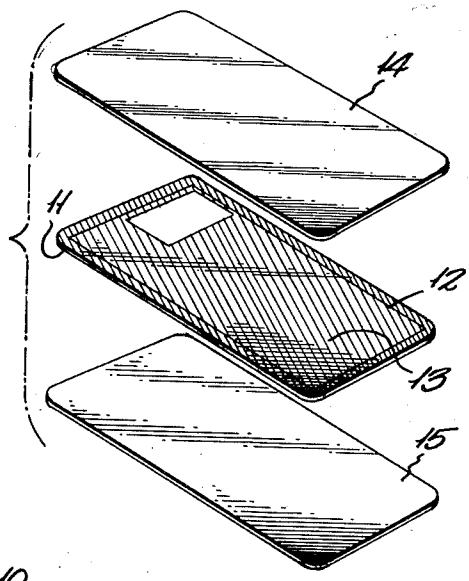
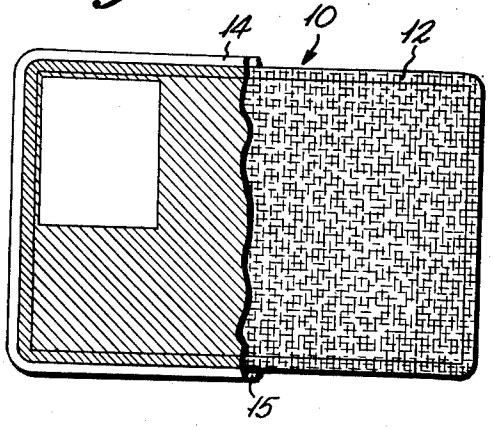


Fig. 3.



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TAMPER REVEALING IDENTIFICATION CARD

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2 Claims. (Cl. 40—2.2)

The present invention relates in general to identification cards and badges, particularly of the type carried by members of the Armed Forces and government employees associated with activities subject to strict security regulations, and has particular relation to identification cards having easily distinguishable characteristics when attempts have been made to alter or tamper with the card.

Heretofore, many identification cards and badges provided for workers in activities requiring extensive security precautions have been composed of a paper base or backing member upon which the name of the employer and employee and descriptive information identifying the employee are printed, which paper backing member is thermoplastically sealed between sheets of thermoplastic material such as cellulose acetate or vinyl acetate to preserve the identification card. The purpose of the thermoplastically sealed cover sheets for the card is to discourage alteration of the identification indica on the card by unauthorized persons seeking unauthorized admission to the grounds on which the restricted activities are conducted.

It has been found, however, that this laminated type of identification card may be fairly readily altered by cutting around edges of the thermoplastically sealed cover sheets to split the plastic cover sheets off the paper backing, altering the identification indicia on the paper backing, and covering the front surface of the card with a new cellulose acetate or other clear thermoplastic sheet material which is glued or thermoplastically sealed in position. Likewise, successful attempts at alteration of such identification cards have been made by dissolving the thermoplastic covers off the paper backing in a ketone or ester or other solvent for the cellulose acetate or like material, after which the identification indicia on the exposed paper backing can be altered and new thermoplastic sheets secured in covering relation over the altered paper backing. These alteration techniques have been successfully accomplished with a sufficiently high degree of skill that the substitution is not readily noticeable to the guards examining the identification cards.

An attempt has been made to discourage chemical alteration of such identification cards by dissolving the thermoplastic covers in ketones or other solvents, which involves the printing of the identification indicia and all other matter on the paper backing in an ink or other medium that will be dissolved by the same solvent that dissolves the transparent cover so that all printing or other marks on the paper backing are eliminated when the thermoplastic covers have been dissolved. These efforts to discourage forgeries and alterations have not met with complete success, however, since those seeking unauthorized admission have been able to reprint the paper backing, which is usually formed with substantially non-reproduceable distinguishing watermarks, with copies or facsimiles of the printed matter originally on the card

which so closely simulates the color and pattern of the original card that detection of the alteration of the card is difficult. Accordingly, an object of the present invention is the provision of an identification card of the laminated type in which the printed matter on the paper backing of the card is altered to produce readily detectable characteristics when the thermoplastic cover sheets have been subjected to solvents in which the thermoplastic sheets are soluble.

Another object of the present invention is the provision of a novel identification card of the type having printed matter and identifying indicia on a paper backing member covered by sheets of thermoplastic material, wherein the ink on the paper backing is altered in character by solvent compositions in which the thermoplastic material is dissolvable to give a readily distinguishable appearance to the card.

Another object of the present invention is the provision of a novel identification card of the type having printed matter on a paper backing covered by sheets of thermoplastic material, wherein the printed matter is altered by any of the chemical solvents in which the sheets of thermoplastic material are dissolvable and changed to a form which resists accurate reproduction of the original appearance of the card.

Another object of the present invention is the provision of a novel identification card of the type having printed matter on a paper backing covered by sheets of thermoplastic material, wherein the printed matter is formed in ink having pigment elements of one color which are not soluble in any of the chemical solvents for dissolving the thermoplastic covers mixed with pigment elements of a different color which are dissolvable in any of the solvents for dissolving the thermoplastic covers so that the color of the printed matter on the card is changed when the plastic covers are exposed to chemical solvents.

Other objects, avantages and capabilities of the present invention will become apparent from the following detail description, taken in conjunction with the accompanying drawing, illustrating one preferred embodiment of the invention.

In the drawing:

Figure 1 is a front plan view of an identification card made in conformance with the present invention.

Figure 2 is an exploded perspective view of the identification card illustrated in Figure 1.

Figure 3 is a front plan view of the identification card illustrating the appearance of the card after a portion of the same has been subjected to a solvent for dissolving the thermoplastic sheet material.

Referring to the drawing wherein like reference characters designate corresponding parts throughout the several figures, the identification card embodying the present invention is generally indicated by the reference character **10** and includes a rectangular paper backing **11** which in one preferred embodiment is provided with a printed rectangular border **12** spaced uniformly from the edges of the paper backing and formed of a highly intricate pattern to discourage reproduction or forgery, which border surrounds an area containing printed identification information, generally indicated by the reference character **13**, such as the name of the issuing authority, the name of the party to be identified, the signature of the party to be identified, and other pertinent descriptive information regarding the party.

The paper backing **11** with the printed matter thereon and the descriptive information filled in, is then covered on both sides with rectangular sheets **14** and **15** of clear thermoplastic material, which are preferably of vinyl acetate or cellulose acetate or a copolymer of vinyl acetate

and vinyl chloride. The sheets 14 and 15 of thermoplastic material are designed to be laminated into one unit under heat and pressure, as by the method and with the apparatus disclosed in my earlier Patent No. 2,490,-111, issued December 6, 1949.

It is well known that the principal clear thermoplastic sheet materials suitable for use as the covers of such paper backings are soluble in ketones and esters so that the thermoplastic covers can be readily dissolved away from the paper backing by such chemical compounds to expose the paper backing and permit alteration of the identifying information thereon. To discourage this method of alteration of the identification card, the printed border 12 and identification information 13, in accordance with the present invention, are formed with a special ink having pigments of two or more colors which produce one distinctive combination color when both pigments are present on the card. However, one of the color pigments is readily soluble in the same ketone and ester solvents in which the thermoplastic sheets 14 and 15 are soluble, so that that pigment is dissolved when an attempt is made to dissolve the thermoplastic covers 14 and 15 and the remaining pigment which is insoluble in these solvents establishes a distinctive color which may be readily detected by persons inspecting the identification card.

In one preferred embodiment, illustrated in the drawing, the border 12 and identification information 13 are printed in an ink having a pigment known to the trade as Lead Chromate Yellow, which is mixed with pigments known as Victoria Blue, Tungstated Rhodamine and Malachite Green. These four pigments when combined in a single ink produce a green color. The Lead Chromate Yellow is insoluble in ketones and esters while the Victoria Blue, the Tungstated Rhodamine and the Malachite Green are all soluble in ketones and esters. Consequently, when the identification card or portions thereof are subjected to ketone or ester solvents to dissolve the thermoplastic sheets 14 and 15, the Victoria Blue, Tungstated Rhodamine and Malachite Green pigments are all dissolved, and the color of the border and identification information on the card is changed to that of the Lead Chromate Yellow pigment. Overprinting of the Lead Chromate Yellow pattern and identification information or other reprinting techniques to reproduce the original color is resisted or discouraged, since precise registration of the reprinting pattern with the Lead Chromate Yellow pattern is very difficult to achieve, as is the selection of the proper reprinting ink or pigments which, when optically combined with the Lead Chromate Yellow, restores the original color of the card.

Another ink combination which has been found satisfactory is the combining of Lead Chromate Yellow pigments with Tungstated Rhodamine pigments. The combination of these two pigments in an ink yields a red color, while the removal of the Tungstated Rhodamine pigments by dissolving the same in ketone and ester solvents renders the border and identification information a yellow color, as determined by the Lead Chromate Yellow.

A third combination which has been found to be satisfactory is the combination of Benzedine Yellow with Victoria Blue. The Benzedine Yellow is insoluble in ketone and ester solvents and the Victoria Blue is solvent in these compositions. The combination of these two colors gives a green color to the printed border and identification information and the dissolving of the Victoria Blue when the thermoplastic sheets 14 and 15 are subjected to solvents leaves only the yellow pigment on the paper backing 11.

In general, the inks are a combination of linseed and oleo resinous varnishes combined with a small percentage of cobalt and manganese driers. As indicated in the examples given above, the object in the pigment construction is that the ink, when mixed be composed of two or more colors, at least one of the colored pigments being insoluble in at least the conventional solvents employed to dissolve the thermoplastic sheet material, while one or more of the other colored pigments must bleed out on application of the solvent to the identification card.

In order to discourage or prevent mechanical removal of the thermoplastic sheets 14, 15 from the paper backing 11, the paper backing 11 is preferably impregnated with a thermoplastic material so as to bond the paper backing to the cover sheets when the heat and pressure of lamination are applied to the backing and cover sheets to render these components homogeneous.

As a further precaution to prevent alteration of the card, the paper backing 11 is treated in the following manner:

To a solution of 100 grams of water is added 18 grams (dry weight) of aluminum sulfate. To another 100 grams of water is added 5 grams of aluminum chloride (dry weight). These two solutions are mixed together in equal volume and to each 100 grams of this combined solution is added 1 gram of a wetting agent with nonionic characteristics, for example, alkylated aryl polyether alcohol. This solution is applied to the backing 11 after the printing or lithographing 12 and 13 has been placed thereon. The temperature of the solution is held to approximately 80° F. The backing 11 is then dried by dry air.

The purpose of this process is to make any alteration of the identification card impossible by destroying the fibre strength of the paper insert during the heating process of lamination and render the paper more compatible to the thermoplastic cover material to assure that the paper will remain laminated to the transparent covers when they are heated without pressure in an attempt to peel off the covers. This solution also increases the compatibility of the ink on the paper to the thermoplastic cover without altering the appearance when the paper strength is destroyed during lamination. When an attempt is made to reseal a card after a first lamination by a second lamination the thermoplastic material will melt, flow and cause a distoration of the card. As the backing has no fibre strength, the result will be cracking and discoloring, which is readily apparent to an observer. It also prevents resealing by mechanical means because there is no strength in the backing 11 and it will readily absorb any adhesive used, thus causing the face of the card to become smeared or otherwise blemished.

While but one particular embodiment of the invention has been particularly shown and described, it is apparent that various modifications may be made in the invention without departing from the spirit and scope thereof, and it is desired, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and are set forth in the appended claims.

I claim:

1. In an identification card, a paper backing member of substantially rectangular shape, a pair of cover members of transparent thermoplastic sheet material coextensive with said backing member and thermoplastically sealed in surrounding relation with the same, said cover members being soluble in certain solvents, and matter on at least one face of the backing member printed with a colored ink having combined therein a first pigment of a distinctive color which is insoluble in said solvents and at least a second pigment which is dissolvable in said solvents and which is of a distinctive color from said first pigments, the printed matter having throughout a color which is the product of concurrence of said first and second pigments and which product color is changed to a readily discernible different color by dissolving of the second pigment upon application to the card of any of the solvents for dissolving said cover members.

2. In an identification card, a backing member of sheet material of substantially rectangular shape, a pair of cover members of transparent sheet material coextensive with said backing member and fixed in surrounding rela-

tion over the same, said cover members being soluble in certain solvents, intricate design patterns on at least one face of the backing member printed with an ink having combined therein ink pigments of at least two colors, one group of said color pigments being insoluble in the solvents in which the cover members are soluble and at least one other group of said color pigments being soluble in said solvents, the last-mentioned group of said color pigments being of a distinctive color from said first-mentioned group, the coexistence of said pigments in the ink forming said printed patterns producing a distinctive color which is changed to a readily distinguishable different color determined predominantly by said insoluble pigments upon dissolving of the soluble pigments through application to the card of solvents for dissolving said cover members.

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