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3,204,354

TAMPERPROOF, ENCAPSULATED IDENTIFICATION CARD

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FIG. 1

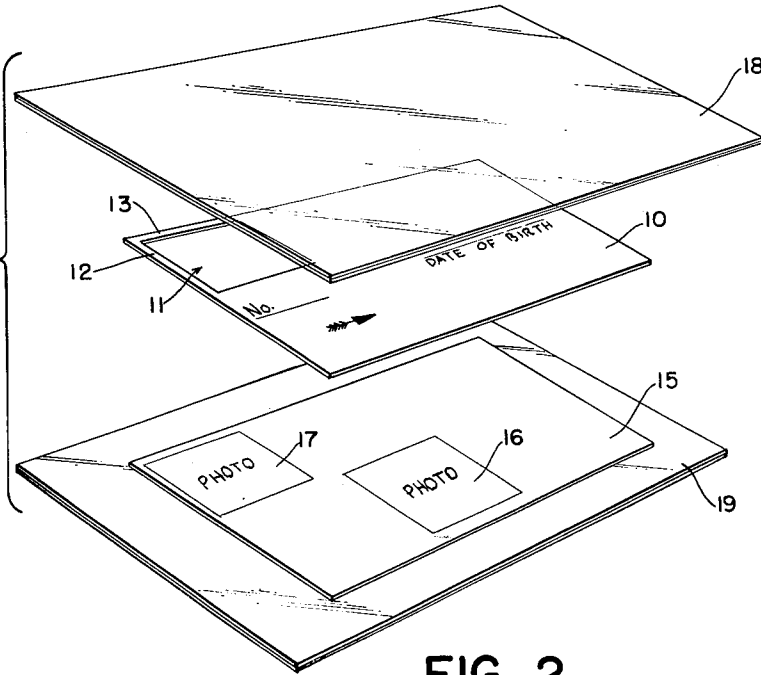


FIG. 2

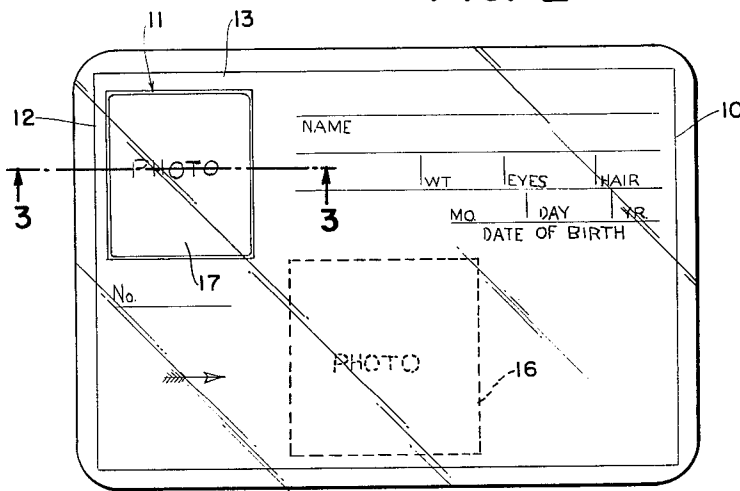
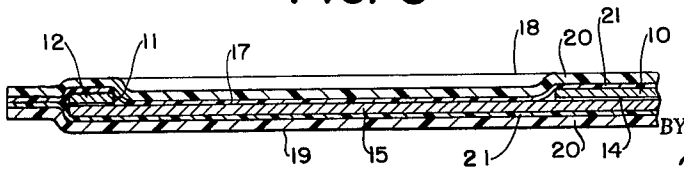


FIG. 3



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4 Claims. (Cl. 40—2.2)

The present invention relates to tamperproof documents, and particularly to tamperproof documents of the type utilized for personal identification, or at least including information establishing personal identity.

Personal identification cards and/or other documents including personal identification are in present widespread use, for many purposes. However, most of the present documents of this type, which hereinafter will be referred to generically as identification cards, are subject to the serious shortcoming that the identification information may be readily tampered with and altered. In the past, substantial efforts have been directed to the development of identification cards which were effectively tamperproof, and such efforts are reflected, for example, in the substantial number of prior patents relating to identification card constructions. However, notwithstanding these substantial efforts, no effectively tamperproof identification card has been adopted for widespread utilization. This is due, I believe, to the fact that those identification card systems which may be able to provide effective protection against tampering and alteration are so costly and difficult to prepare and produce as to be impractical from an economic standpoint.

It is a fundamental objective of the present invention to provide a novel and significantly improved identification card which is wholly encapsulated for protection against water, etc., which effectively prevents any tampering or alteration without total destruction of the card, and which is so designed and constructed as to be capable of automatic low cost production on a widespread commercial scale. A particularly advantageous contemplated use of the new identification card is in the manufacture of low cost, permanent, tamperproof drivers' licenses, for example, which may be quickly and economically processed and prepared in large volumes.

More specifically, the present invention provides an identification card which may generally be of the type illustrated in the prior United States Patent No. 2,395,804, but which incorporates specific and substantial improvements enabling significant reductions in manufacturing costs, greatly simplifying processing operations involved in the translations of identity information onto the identification card and, in addition, providing a more desirable finished product.

In general, the identification card of the invention includes an information-bearing top sheet formed of a printable material which is relatively opaque to reflected light while being at least somewhat transparent to light transmitted through the paper from its bottom surface. Laminated to the bottom surface of the information-bearing sheet, by means of a heat-activated adhesive provided thereon, is a sheet of photographic print paper, the adhesive bond being such as to prevent separation of the two sheets without destroying at least the sensitive emulsion layer on the upper surface of the photographic sheet. In accordance with specific aspects of the invention, the photographic sheet, prior to lamination to the information-bearing top sheet is provided on two spaced, pre-designated areas of its surface with identical photographic exposures, typically the face of the subject to be identi-

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fied. After lamination of the two sheets, one of the photographic exposures is concealed under the top sheet, while the other photographic image is directly exposed through a predetermined cut-out opening provided in the top sheet. The laminated sheets are thereafter completely encapsulated by top and bottom films of heat sealable, transparent plastic material, sealed not only about the edges but also to the exposed surfaces of the laminated sheets themselves.

The provision of two identical photographic exposures, on a single photographic sheet, one image being concealed and one exposed in the finished product, significantly reduces the complexity of the manufacturing and processing procedure, in addition to reducing the amount of material required in the finished product as compared to, for example, prior art identification cards represented by the prior United States Patent No. 2,395,804. In addition, by forming both photographic exposures on a single photographic sheet, consistent duplication of the desired image is assured by uniformity of the sheet itself and the uniformity of exposure and development conditions, which is not necessarily true where entirely separate photographs are prepared.

For a better understanding of the invention, reference should be made to the following detailed description and to the accompanying drawing, in which

FIG. 1 is an exploded perspective view showing the component parts of an identification card incorporating the features of the invention;

FIG. 2 is a top plan view of an assembled identification card according to the invention; and

FIG. 3 is an enlarged, fragmentary, cross-sectional view taken along lines 3—3 of FIG. 2.

Referring now to the drawing, the reference numeral 10 designates a top sheet of the card assembly, which is advantageously formed of a paper material having relatively good light reflecting characteristics but being relatively transparent to light transmitted directly through the sheet from its bottom surface. A number of commercially available grades of paper are suitable for this purpose. Depending upon the purpose to which the identification card is put, the top sheet 10 is provided with appropriate information which, among other things, would normally include the name, address and physical description of the intended bearer of the card. In addition, where the card is utilized in one of its most advantageous applications, as a tamperproof driver's license, the top sheet 10 may include other appropriate information, such as license number, license restrictions, expiration date, etc.

In accordance with one of the significant aspects of the invention, the top sheet 10 is provided with a cut-out opening 11 of predetermined dimensions. Advantageously, opening 11 is of rectangular shape and is located in the upper left hand corner area of sheet 10. Desirably, the opening is set in from the edge extremities of the rectangular sheet, so that framing margins 12, 13 are provided along side and top edges of the opening.

According to another aspect of the invention, the top sheet 10, which may be descriptively characterized as semi-transparent with reference to its ability to reflect incident light while transmitting light passing directly through from its bottom surface, is provided over its entire bottom surface with a predetermined layer 14 (FIG. 3) of adhesive material. Most advantageously, the adhesive layer 14 is formed of a thermoplastic material or is otherwise adapted to be activated by the application of heat. Accordingly, during the initial processing of the identification card, the top sheet 10 may be conveniently handled for writing or typing information thereon, impressing a fingerprint, etc., without causing adherence of the top sheet to typewriter platen rolls, for example.

However, the adhesive layer may be readily and controllably activated when desired, as when the entire card assembly is laminated and encapsulated under heat and pressure as will be described in more detail.

Referring again to FIG. 1, the reference numeral 15 designates the bottom sheet of the card assembly, which is a so-called photographic sheet having an upper surface layer of light-sensitive emulsion of a conventional type. The emulsion layer (not specifically illustrated) and the adhesive layer 14 are of a compatible nature which, in the sense used herein, means that when the top and bottom sheets 10, 15 are brought together under heat and pressure and bonded together, the bond between the top sheet and the emulsion layer is such that, upon any subsequent separation of the two sheets, the emulsion layer will be substantially or entirely destroyed. In accordance with one of the significant aspects of the invention, the photographic bottom sheet is provided on two predesignated areas 16, 17 with substantially identical photographic exposures, typically showing the face of the intended bearer of the identification card. Although it may be satisfactory for the exposed areas 16, 17 to be of slightly different size, it is desirable (and readily possible with the construction of the present invention) for the exposure conditions to be identical, so that the photographic images on the preselected areas 16, 17 may be recognized as being substantially identical. The remaining area of the photographic sheet 15 is suitably masked during the exposure process so that after the development of the entire sheet 15, the unexposed areas will remain white.

After exposure and development of the photographic sheet 15, to provide the two identical image areas 16, 17, the top and bottom sheets are laminated together under heat and pressure, by the medium of the heat-activated adhesive 14. This may be done in conjunction with or separately from an encapsulating procedure to be described, as may be expeditious under the circumstances.

In accordance with one of the significant aspects of the invention, the exposure image area 17, is so located on the bottom sheet 15 as to be in registry with the cut-out opening 11 when the top and bottom sheets 10, 15 are assembled in edge registration and bonded together. The image area 16 is located out of registry with the cut-out opening 11, so as to be relatively concealed by the top sheet 10. In this respect, the top sheet may desirably be devoid of surface printing in the region of the imaged area 16, substantially as indicated in FIG. 2. By appropriate selection of the characteristics of the top sheet 10, concealed image 16 may be made to be relatively invisible from the front of the card, but can be rendered readily visible by shining a light through the card from the bottom. The image 17 is, of course, clearly visible through the cut-out opening 11.

The assembled top and bottom sheets 10, 15, either along with or after lamination, as the case may be, are completely encapsulated within a protective heat-sealable film material. Advantageously, the encapsulating film comprises top and bottom film sections 18, 19, which are disposed above the top sheet 10 and below the bottom sheet 15, respectively. The film sections 18, 19 advantageously are comprised of outer film layers 20 of polyethylene terephthalate (Mylar) bonded to an extruded-on, inner layer 21 of polyethylene, the polyethylene advantageously having its exposed surface treated for heat sealability to itself and to paper.

In the encapsulating operation, which may be combined with the laminating operation where appropriate, the film sections 18, 19 are placed above and below the cards, with their treated polyethylene surfaces in facing relation, and heat and pressure are applied through appropriate means over the entire outer surface areas of the film sections 18, 19. The films are thus conformed intimately to the exposed surfaces of the card assembly and are brought together in contacting relation in continuous marginal areas provided around the entire pe-

riphery of the assembled sheets. In this respect, the top film section 18 is deformed into the cut-out 11 and is brought into intimate contact with the imaged surface area 17 of the bottom sheet 15. The heat and pressure of the encapsulating operation causes the treated polyethylene surface layer to be heat bonded intimately to the outer surfaces of the sheets 10, 15 and to the imaged area 17. Similarly, a watertight, substantially homogeneous heat seal bond is provided around the entire periphery of the encapsulated assembly.

In a particularly advantageous, contemplated use of the new identification card for tamperproof drivers' licenses, the license applicant will present, together with the usual official application form, a suitable photograph which, advantageously, bears his written signature along an unexposed edge portion and has impressed on the back a print of the applicant's thumb. The complete application, consisting of the official form and the signed and thumb-printed photograph, may be processed by a clerk who transfers appropriate identifying information to the top sheet 10 and causes the photograph to be reproduced in duplicate on the image areas 16, 17 of the photographic sheet 15. The card elements are then laminated and encapsulated in the manner described to provide a permanent, tamperproof license identification. The entire operation can be completed in a practical minimum of time, with a minimum handling of card components, so that the material and labor costs involved in preparing the encapsulated card are extremely low and well within the practical and economical requirements of a universal license and identification system.

For semi-automated production of identification cards, the encapsulating films as well as the top and bottom sheets advantageously are supplied and processed in continuous forms. The top and bottom sheets, in such a case, advantageously will be notched about their peripheries and perforated along their connected edges for easy separation. The continuous form top and bottom sheets, after processing to apply information to the top sheet and exposure images to the photographically sensitive bottom sheet, are passed through a suitable collator, where the separate sheets are matched and registered. The matched and registered sheets then travel through a laminator, which encapsulates the cards and activates the heat sensitive adhesive to bond the top and bottom sheets. Thereafter, the laminated assembly is severed from the continuous supplies of forms and films to provide a finished card. The films, in addition to being bonded to the top and bottom surfaces of the laminated sheets, are joined in a film-to-film bond through the notched edge areas of the sheets.

In the finished, encapsulated card, the heat activated bond between the top and bottom sheets is such that any separation thereof will cause destruction of the concealed photographic image. In addition, the character of the ink with which the top sheet 10 is printed is such that, upon lamination, the ink has a better bond to the film than to the paper so that any separation of the film from the top sheet will cause the printed information on the top sheet to be at least partially destroyed.

The identification card of the invention, while providing effective protection against tampering and alteration of the identification, is so designed as to minimize material and labor costs in manufacture. Heretofore, among the many proposals for so-called tamperproof permanent identification cards, those which may in fact have been relatively tamperproof have proved to be economically or otherwise unsuitable for mass production and widespread utilization. In this respect, one of the specific, important features of the present invention resides in the provision of a photographically sensitive back sheet which is exposed to have duplicate images on two selected areas, one of which is concealed and one of which is readily visible through a cut-out opening provided in the top sheet. In addition, the top sheet incorporates a heat-activated adhesive layer, which enables the encapsula-

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tion and lamination operations to be performed in one step and which assures destruction of the concealed photograph upon any attempt to separate the top and bottom sheets 10, 15.

It should be understood that the specific form of the invention herein illustrated and described is intended to be representative only, as certain changes may be made therein without departing from the clear teachings of the disclosure. Accordingly, reference should be made to the following appended claims in determining the full scope of the invention. 10

I claim:

1. A permanent, tamperproof identification card, comprising

- (a) an information-bearing top sheet formed of semi-transparent material, 15
- (b) said top sheet having a cut-out opening in one predetermined area thereof,
- (c) a continuous bottom sheet of full card dimensions disposed below and in contact with said top sheet and having a photographically sensitive layer on its top surface, 20
- (d) the top surface of said bottom sheet being photographically exposed in spaced separate areas to form identical, spaced identification images, 25
- (e) one of said identification images being positioned in substantial registry with the cut-out opening in said top sheet and being readily visible therein, and the other of said image areas being out of registry with said opening and being visible to a limited extent through the semi-transparent material of the top sheet,

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(f) adhesive means joining said top sheet and the top surface layer of said bottom sheets with an image-destroying bond, and

(g) encapsulating films enclosing said sheets and forming a continuous seal about the periphery thereof.

2. The identification card of claim 1, in which

(a) said adhesive means comprises a heat-activated adhesive layer provided on the bottom surface of said top sheet.

3. The identification card of claim 1, in which

(a) said encapsulating films comprise top and bottom films of polyethylene terephthalate disposed above and below said sheets and secured in heat-sealed relation about the edges of said sheets.

4. The identification card of claim 3, in which

(a) said films of polyethylene terephthalate are provided along their facing surfaces with extruded-on layers of polyethylene, and

(b) said layers of polyethylene are heat bonded to said sheets and to each other.

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