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Changnon

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[54] **INDIVIDUAL IDENTIFICATION DEVICE**

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[73] Assignee: **U.S. Research & Development Corp.**, Des Plaines, Ill.

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[21] Appl. No.: **61,150**

[52] **U.S. Cl.** **40/2.2**, 283/7

[51] **Int. Cl.** **G09f 3/02**

[58] **Field of Search** 40/2.2; 283/7

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[57] **ABSTRACT**

An improved individual identifying device (e.g., a credit card) comprising a support base (e.g., an opaque vinyl plastic plate), an individual identifying image (e.g., individual photograph and/or signature) imposed photographically with photosensitive ink on the support base, and a transparent protective cover (e.g., vinyl plastic) laid down (e.g., by laminating) over the image, wherein the support base and the image imposed thereon and the transparent protective cover are unified into an indivisible combination whereby any attempt to alter the photographic image would deform the identification device.

17 Claims, 9 Drawing Figures

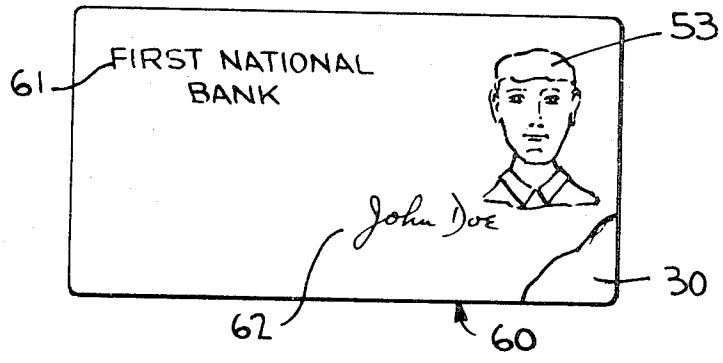


FIG. 1

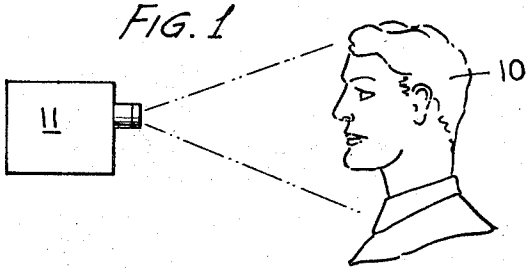


FIG. 2

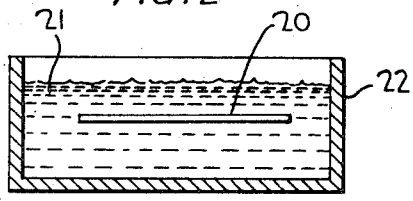


FIG. 3

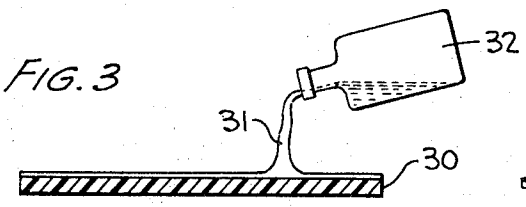


FIG. 4

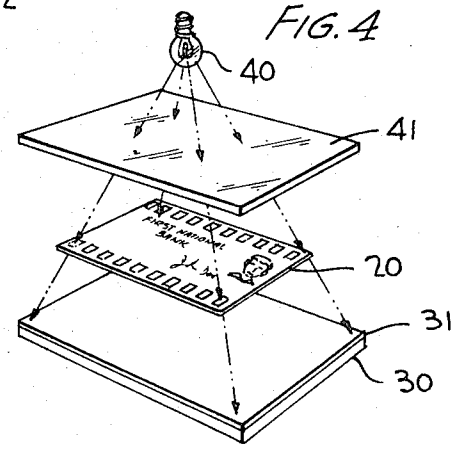


FIG. 5

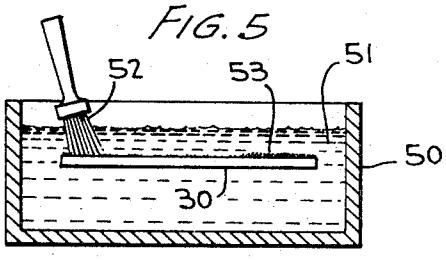


FIG. 6

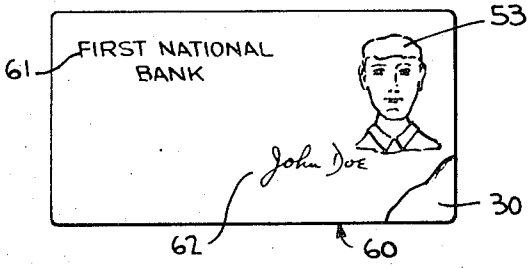


FIG. 7

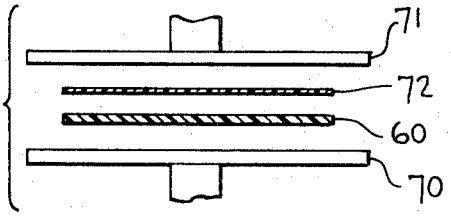


FIG. 8

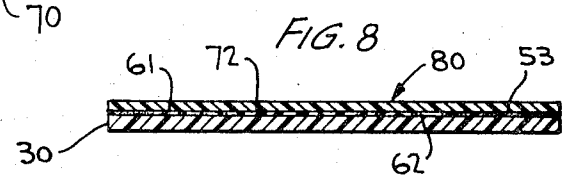
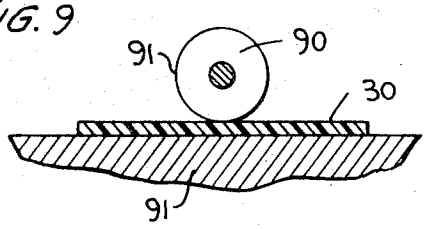


FIG. 9



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INDIVIDUAL IDENTIFICATION DEVICE

BACKGROUND OF THE INVENTION

The utilization of individual identification cards is presently increasing at an enormous rate and there is every indication that this trend will accelerate even further in the future. Examples of individual identification cards include driver's licenses, voter registration cards, social security cards, identification cards utilized for commercial and government security purposes, and particularly the greatly expanding field of credit cards which are used by banks, oil companies, airlines, retail stores, etc. It has been said that the modern economy is moving towards a completely credit-form economy or expressed another way is moving towards a money-less society.

With the benefits that come from the increasing use of identification cards, there are also problems. One of the most serious problems is the fraudulent use of identification cards, particulary the fraudulent use of credit cards although the problem is not limited solely to credit cards. In the case of credit cards, there is an increasing frequency of utilization of these cards by wrongful owners as a result of these cards being stolen from or lost by the rightful owner. These problems arise from the fact that many credit cards do not have any individual identifying characteristics shown on the card, such as a photograph or picture of the individual or his signature. In these cases, a wrongful user of the card cannot be identified readily by the one who is extending the credit to the credit card holder. To overcome this problem considerable effort is being expended to develop ways to overcome this type of fraudulent use of credit cards. Some of the techniques being developed include elaborate devices that relate the hand measurements of an individual to certain identifying, coded information encoded on the credit card.

Another way of trying to solve the problem of identifying the credit card holder is to insert a paper card containing the picture and/or signature of the credit card holder into a plastic holder or enclosure. Such cards have been prepared by pasting a picture of the credit card holder on a paper identification card and inserting this into the plastic holder and sealing it. More recently an identification card has been introduced which is constructed by taking a color photograph of a card containing a picture and signature of the credit card holder, inserting the developed film between two sheets of plastic and then sealing the plastic around the film. However, the basic problem to date with this approach to credit cards is that fraudulent users can cut or break open the sealed cover and remove the basic identification card and easily forge a modified identification card. This can be accomplished, for example, by pasting a picture of the wrongful holder of the card over the original picture, taking a new color photograph of the modified card, developing the photo and then sealing the modified card back into the plastic and using the card fraudulently.

SUMMARY OF THE INVENTION

The present invention relates to an improved individual identifying device which is practically fraud-proof. Basically the devices of the present invention comprise a support base, an individual identifying image imposed photographically on the support base and a protective transparent cover laid down over the image wherein the support base and the image imposed thereon and the transparent protective cover are unified into an indivisible combination whereby any attempt to alter the photographic image would result in permanent deformation of the identification device.

It is an object of the present invention to prevent or reduce the fraudulent use of identification cards.

It is a further object of the present invention to protect the issuer of identification cards from fraudulent use of such cards by wrongdoers.

It is a further object of the present invention to protect the rightful holder of identification cards from the wrongful use of such cards if lost or stolen.

These and other objects of the invention will become apparent from the following description of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 of the drawings shows the step of taking a picture of the prospective rightful owner of an identification card.

FIG. 2 shows the step of developing a negative of the picture.

FIG. 3 shows the step of coating the support base with a solution of photo-sensitive ink.

FIG. 4 shows the step of producing a fixed image of the individual's picture on the support base.

FIG. 5 shows the step of removing unreacted solution from the support base on which the picture image is imposed.

FIG. 6 shows the support base with the card holders picture imposed thereon.

FIG. 7 shows the step of covering the support base and the image thereon with a transparent protective cover.

FIG. 8 shows in side view the unified combination of the support base, the image thereon and the transparent protective covering laid down over the base.

FIG. 9 shows an additional optional step in which other information identifying markings are printed on the support base prior to laying down the transparent protective coating.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will be best understood by reference to the drawings. FIG. 1 illustrates the step of photographing individual identifying information for an individual who is to receive the identification card. In FIG. 1 the identifying information is to be a photograph or picture of the individual. However, if desired a number associated with the individual or his signature or other identifying information (such as weight, height, color of hair and eyes) could also be photographed either all together or in separate photographs. In fact, an identification form which contains all of this information could be photographed. In FIG. 1 individual **10** is photographed with photographic means **11**, such as a camera. It is to be understood that the individual normally would be a human being, but that the individual could also be an animal, corporation or company, association, etc.

FIG. 2 illustrates the step of producing a photographic negative of the identification information. In this figure, the negative **20** is developed in a conventional developing solution **21** contained in container **22**. If desired, the negative can be screened which is also a conventional step in photography. The film used

can be of any conventional type. The size is not critical although the use of 35 millimeter film is advantageous in the case of many identification cards since this size corresponds closely to the size of the normal identification card.

FIG. 3 shows the step of coating a support base with a photo-sensitive ink solution which contains an ink that hardens upon exposure to light. The support base 30 shown in FIG. 3 can be made of a variety of material such as plastic, glass, wood, metal, paper, etc. Preferably, however, it is made of plastic for reasons that will be discussed shortly. In the case of a plastic support base, any solid plastic base may be utilized. Preferably a thermoplastic plastic is utilized such as vinyl plastics, e.g., polyvinyl chloride, polyvinyl acetate, copolymers thereof, etc. The plastic Mylar is a preferred support base. Preferably the plastic base is opaque being made so by the addition of fillers or coloring agents to the plastic when it is manufactured. Preferably, the support base is flat (e.g., a plate) and is relatively stiff with regard to bending. Also, preferably the plastic is such that it will not readily crack or break on bending. The thickness of the support base and its length and width depend primarily upon the nature of the identification card dimensions which will be required. Normally the width and length are selected in accordance with this invention to correspond generally to the dimensions desired for the final form of identification card. The thickness of the support base is selected such that the thickness of the support base plus the thickness of the protective cover or covers will produce a final identification card having a thickness in the range of about 20 to 40 mils, preferably about 30 mils which is a specification, for example, of a number of identification cards, particularly credit cards. The photo-sensitive ink solution that is utilized in this invention is one which is conventional and commercially utilized in the photo-lithographic process to produce proofs of the photograph prior to preparing the final printing plate for photo-lithography. The photo-sensitive ink solution is normally a water soluble solution of printing ink pigments (e.g., a colloido solution containing sasseinate) which when exposed to high energy light results in the hardening of ink and the production of a positive fixed image related to the image on the negative. The ink pigments may be selected to be of any color. Although black maybe normally used, other colors such as red, blue, green, etc. may be used. The photo-sensitive ink selected is normally one which will lay down a fixed image visible to the eye, but in certain cases an ink invisible to the human eye may be utilized to impose on the support base markings which may be read electronically or only under the proper type of special light to assist in the identification of the identification card holder. An example of a commercially available photo-sensitive ink solution that may be utilized is Kwick-Proof. In FIG. 3 the photo-sensitive ink solution 31 is poured from container 32 over the support base 30, but it should be understood that the solution can be applied by any conventional means such as brushing, dipping, etc. Only a thin coating of the photo-sensitive ink solution is required, namely the amount which is conventionally utilized in photo-lithography for producing a proof of the picture to be printed.

FIG. 4 shows the step of imposing a fixed image from the photographic negative 20 on the support base 30 by passing energy from energy source 40, such as a high-energy light source, through the negative 20 to the photo-sensitive ink solution 31 laid down on support base 30. Preferably a protective means 41 is interposed between energy source 40 and the negative 20 to protect it from excessive heat. Protective means 41 for example can be a plate of glass and preferably one which absorbs some of the heat without appreciably diminishing the amount of light transmitted through the negative. The relative spacing of energy source 40, negative 20 and the coated support base 30 are selected to provide the size of image that is desired to impose on support base 30, as is conventional in photography and photo-lithography. If a 35 millimeter negative is used then it can be possible to have support base 30 with its coating 31 in physical contact with negative 20 which in turn is in physical contact with protective means 41. The time of exposure is selected to produce a viewable fixed image on support base 30. The time will depend primarily on the intensity of the energy source and will normally be in the range of 10 seconds to 5 minutes. The exposure step shown in FIG. 4 results in the "burning" or embedding or hardening of the ink on the support base 30 to produce an image corresponding to the image on the negative 20.

When the step shown in FIG. 4 is completed, support base 30 is ready for the step illustrated in FIG. 5, which step involves the removal of unreacted or unhardened solution. In FIG. 5 support base 30 is placed in container 50 which contains water or other wash solution 51 and brush 52 is utilized to brush off the unreacted solution leaving the fixed image 53 imposed on support means 30. It is to be understood that any method of cleaning off the unreacted or unhardened photo-sensitive ink solution may be utilized, including simply washing the solution off by placing the support base 30 under a running faucet of water. After this step is completed, which is conventional in photo-lithography, if desired, support base 30 and image 53 imposed thereon may be placed in a solution of brightener as is done in photo-lithography to brighten the picture. This brightening step improves the brightness and clarity of the image and therefor is a desirable step but not an essential step of the present invention.

FIG. 6 shows in detail the resultant product 60 of the previous steps. Product 60 comprises the support base 30 and the photograph or picture or facial image of individual 10 as image 53 on the support base 30. Product 60 also shows additional identifying information 61 on it, which may be likewise produced by the photographic technique described above or may be laid down by printing which will shortly be described in greater detail. Identifying information 61 represents information identifying the type of identification card that is involved. FIG. 6 also shows additional individual identifying, information 62 which represents an image of the signature of individual 10 and which may be imposed on support base 30 either simultaneously or separately with respect to image 53.

FIG. 7 illustrates the step of providing a transparent protective cover over product 60. In the process shown in FIG. 7 a transparent sheet of plastic, namely cover 72, is laid over product 60 and press plates 70 and 71 are then pressed down and up respectively to bond through pressure and heat product 60 to plastic cover 72 so as to produce a unified identification device. The plastic cover 72 may be a sheet of vinyl plastic of the same type referred to with regard to support base 30.

Normally it should have characteristics of transparency, toughness, hardness, and resistence to scratches, moisture, and wear. The dimensions are selected such that the width and length are of approximately the size desired for the final identification card, although of course a larger or smaller size may be selected but this would tend to complicate the manufacturing process, such as requiring the additional step of trimming. An alternative means of laying down the protective cover would be to coat the product **60** with a lacquer or other plastic solution which would be subsequently hardened; such as by drying or by exposing the coated product to heat, light, etc. The thickness of protective cover **72** is normally in the range of about 1 to 5 mils, but again this is not particularly critical and will depend upon the final thickness desired for the identification card and will also depend on whether a second protective cover is applied to the other side of the identification card (which will normally be determined in turn by whether additional identifying information is imposed on the other side of the identification card). Again, as indicated previously, a thickness of about 20 to 40 mils, preferably about 30 mils for many applications would normally be selected. In the laminating step of FIG. **7**, the time required for lamination will depend on the degrees of temperature and pressures used, that is, the higher the temperature and the higher the pressure, the shorter will be the time that is required. Pressure in the range of 10 to 10,000 (e.g., 1,000 to 5,000) pounds per square inch may be utilized although higher or lower pressures may also be used. Temperatures in the range of 100° to 500° Farenheit (e.g., 150° to 300°F) may be utilized although again higher or lower temperatures may be utilized. Basically, the time, temperature and pressure variables are selected to produce an indivisible bond in a reasonable period of time. Also a cooling cycle may be utilized to further aid in the bonding. Times in the range of 30 seconds to 30 minutes may be utilized although normally a range of 5 to 20 minutes would be used.

FIG. **8** shows the final identification device **80** wherein support means **30** and images **53, 61** and **62**, imposed thereon and protective cover **72** are fused or bonded together in an indivisible combination whereby any attempt to alter the identifying images would result in the deformation of the identification card. The product of the present invention can be made in the nature of conventional credit cards of the type which most people are familiar with which are tough; non-brittle; hard; scratch, moisture and wear-resistant, and which are practically impossible to alter without deforming the credit card and which can only be destroyed by continuous vigorous bending over a prolonged period of time. Of course, the significant difference between these types of credit cards or identification cards and those of the present invention is that the devices of the present invention include an individual identifying characteristic or information such as an individuals photograph (or picture), or signature, or both.

Identification cards of the present invention can also be further processed like the conventional unitary credit cards (that is, those that contain identifying information, but not the photograph or picture of the individual and/or his signature) to provide additional identifying information imposed by various conventional techniques, for example, additional identifying information such as the persons name or identification number may be embossed on the card in raised print. Also, machine readable impressions such as are conventionally provided on credit cards for processing the credit slips may be embossed in raised print. Also, techniques of punching holes, round or rectangular, in the card may be utilized for similar bookkeeping purposes. It is of interest to note that in the case of the identification devices of the present invention, the punching of such holes creates no problems of the type that could be anticipated in the case of identification cards wherein a paper identification card is inserted between two plastic covers. In the case of these plastic covered paper cards, punching would expose the paper to water, moisture, dirt and the like and their useful life would be greatly reduced.

FIG. **9** shows the step of printing additional identifying information on support base **30** prior to the step in which the protective cover **72** is laid down on the identification device. In FIG. **9**, the support base **30** has imprinted on it additional identifying means by printer **90** which is provided with a printing plate **91** which prints on such information when support means **30** is passed by printer **90** on support **91**. It is to be understood that the printing of additional identifying information on support base **30** can be done on one side or the other side only, or on the two sides (or surfaces) of support base **30**. If identifying information is imposed on both sides of support base **30**, then normally a protective cover such as protective cover **72** is laid down on both sides of support base **30** on which the printing or images are imposed.

SPECIFIC EMBODIMENT OF THE INVENTION

The following is a preferred embodiment of the invention. First a photograph of an individual is taken with a conventional camera. A negative on 35 millimeter film is then prepared by conventional photographic techniques and preferably a screened negative is produced. Independently, a plate of vinyl plastic about 3½ by 2 inches in height and width respectively and 28 mils thick and which is white in color is run through a printing press to print thereon the identification of the type of identification card such as the "The First Trust and Savings Bank" and "Credit Card". This information is imprinted in the upper right hand part of the card. The card is then coated with Quik-Proof which is utilized conventionally and commercially in the manufacture of photo-lithography. A conventional apparatus for making such photo-lithography proofs is then utilized to impose the image of the individual's picture on the printed credit card. Exposure of the negative is continued until a fixed, hardened image of the individual's picture is imposed on the credit card. An ultra violet light source is used and the coated credit card, the negative and a protective glass of about one-half inch in thickness are pressed together under a vacuum to carry out the image producing step. Exposure of about 2 minutes is required. The image of the picture is imposed on the upper left of the credit card. The credit card is then washed clean of unreacted solution with water and wiped with a sponge. It is then dipped in a conventionally photo-lithographic brightening solution and rinsed again with water. Then a 2 mil sheet of transparent, tough, hard; and scratch, moisture and wear-resistant vinyl plastic (e.g., Mylar) is laid over the top of the credit card on the side on which the identifying information is imposed and the combination is placed in a

heated press (or laminator). The temperature of the press is about 220° Farenheit and the pressure is about 2,000 pounds per square inch and the time for the pressing operation is about 15 minutes. The card is then removed from the press and the resultant product is one in which the plastic support base, the images imposed on the base and the protective vinyl cover have been unified together into an indivisible combination whereby it is impossible to alter the image without deforming or in effect completely destroying the credit card. The use of a plastic support base and a plastic protective cover is particularly advantageous in that a completely indivisible combination can be produced. (If non-plastic materials are employed, such a bond is practically impossible to produce.) Additionally, the card can then be placed into a press wherein the name of the individual and the identification number of the individual are embossed in raised print on the card together with certain machine-readable symbols which are useful in the processing of credit slips issued to the holder of the card. In the case of the present invention, the card is clearly one which can be safely used by the true owner, but not a fraudent owner since the true owner can be readily identified through his picture as the rightful owner of the card.

It is to be understood that the particular sequence of photography steps where there are several pieces of information separately photographed, and also the sequence of photography and printing steps (where these are employed), are not critical and that the steps can be arranged in any particular order or carried out simultaneously.

While the present invention has been described in detailed and specific terms, it is to be understood that other variations of the invention are possible without departing from the spirit of the invention. For example, a reversed image could be imposed on the protective overlay sheet, then the overlay sheet could be placed over a support base with the image side of the sheet facing the support base, and then the support base and the overlay sheet and the image thereof fused into a unified indivisible product to produce, for example, an individual identification card.

What is claimed is:

1. An individual identifying device comprising
a support base,
an individual identifying image imposed photographically with photo-sensitive ink on said support base, said photo-sensitive ink being of the type adapted for producing proofs in photo-lithography and which does not require normal photographic development of the image, and
a transparent protective cover laid down over said image,
said support base and said image imposed thereon and said transparent protective cover being unified in the absence of adhesive and throughout the extent of their contacting surfaces into an indivisible combination, whereby any attempt to alter said photographic image would deform the identification device.

2. A device according to claim 1 wherein said support base is plastic.

3. A device according to claim 1 wherein a facial image of an individual is imposed on said support base as an individual identifying image.

4. A device according to claim 1 wherein the signature of an individual is imposed on said support base as an individual identifying image.

5. A device according to claim 1 wherein information identifying the type of identification device is also imposed on said support base.

6. A device according to claim 1 wherein said ink is of a color, other than black.

7. An individual identification card comprising
a plastic plate,
a facial image of an individual imposed photographically with photo-sensitive ink on said plastic plate, said photo-sensitive ink being of the type adapted for producing proofs in photo-lithography and containing printing ink pigments,
a transparent protective layer of plastic laid down over said image,
said plastic plate and said facial image imposed thereon and said transparent protective layer of plastic being heat-fused throughout the extent of their contacting surfaces into an indivisible combination, whereby any attempt to alter said facial image would deform the identification card.

8. An identification card according to claim 7 wherein the signature of the individual is also imposed photographically with photo-sensitive ink on said plastic plate.

9. An individual identification card according to claim 7 wherein said ink is of a color, other than black.

10. An individual identification card comprising
a plastic plate,
a facial image of an individual imposed photographically with photo-sensitive ink on said plastic plate, said photo-sensitive ink being of the type adapted for producing proofs in photo-lithography and containing printing ink pigments,
information imposed on said plastic plate identifying the type of identification card,
a transparent protective layer of plastic laid down over said facial image and identifying information,
said plastic plate and the facial image and identifying information imposed thereon and said transparent protective layer of plastic forming a unified heat fused combination throughout the extent of their contacting surfaces, whereby any attempt to alter said facial image would deform the identification card.

11. An individual identification card according to claim 10 wherein additional information is imposed on the other side of said plastic plate and a second transparent protective layer is laid down over said additional information and wherein such additional information and its transparent protective cover is unified into an indivisible combination with the other elements of the card.

12. An individual identification card according to claim 10 wherein said ink is of a color, other than black.

13. An individual identification card according to claim 10 wherein said plastic is vinyl.

14. An individual identification card comprising
an opaque vinyl plastic plate,
a facial image and signature of an individual imposed photographically with photo-sensitive ink on said plate, said photo-sensitive ink being of the type adapted for producing proofs in photo-lithography and containing printing ink pigments,

information imposed on said plate identifying the type of identification card,

a transparent protective layer of vinyl plastic laid down over said facial image, signature and other identifying information,

said plate and identifying information imposed thereon and said protective layer forming a unified heat fused combination throughout the extent of their contacting surfaces whereby any attempt to alter said facial image or signature would deform the identification card.

15. An individual identification card according to claim **14** wherein additional information is imposed on the other side of said plastic plate and a second transparent protective layer is laid down over said additional information and wherein such additional information and its transparent protective cover is unified into an indivisible combination with the other elements of the card.

16. An identification card according to claim **14** wherein additional individual identifying information in the form of invisible electronically-readable markings is imprinted on said support base.

17. An individual identification device comprising

a first sheet of plastic

a second sheet of transparent plastic, and

an individual identifying image imposed photographically with photo-sensitive ink on one of said sheets, said photo-sensitive ink being of the type adapted for producing proofs in photo-lithography and which does not require normal photographic development,

said sheets of plastic being heat-fused into an indivisible combination throughout the extent of their contacting surfaces with said image being disposed therebetween, whereby any attempt to alter said image would deform the identification device.

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