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(54) Title: A SECURITY LABEL AND IDENTITY CARD CONTAINING INTEGRATED PERSONAL INDICIA

(57) Abstract: The present invention provides a security label which is attached to documents or objects that have signatures or other identifying marks affixed on their surfaces. Attaching the security label of the invention to the document or object over the signatures or other identifying marks integrates them into the security label. Viewing the label from different angles allows different identifying information to be alternately revealed. The label protects the signature from tampering and thus guaranties the authenticity of the objects to which the protected signature is affixed. The invention further provides an identity card for displaying different images of identifiable, guaranteed authentic information about the holder of the card.

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A SECURITY LABEL AND IDENTITY CARD CONTAINING INTEGRATED PERSONAL INDICIA

Field of the Invention

The present invention is related to the field of document and product verification and security. More specifically the present invention provides a security label and a method for integrating signatures or other identifying marks into the security label on which is printed other identifying information, thereby protecting the signature from tampering and thus guarantying the authenticity of the objects to which the protected signature is affixed. The invention further provides an identity card for displaying different images of identifiable information about the holder of the card.

BACKGROUND of the Invention

The need for providing a means of verifying the authenticity of documents and other objects has existed since ancient times. The most common method of providing this authentication is to affix a unique sign or mark that identifies the organization or individual that has created or that owns the document or object. In the case of individuals, the most commonly used mark is a personal signature. The practical disadvantage of this method is that unscrupulous persons can find ways to counterfeit the mark. In an effort to avoid counterfeiting, additional steps have to be taken.

The exact nature of these additional steps depends on the sophistication of the available technology and ranges from wax seals and rubber stamps placed over all or a part of the signature to plastic coated cards incorporating holographic pictures of the card bearer. As each increasingly more sophisticated method has been developed, even more sophisticated counterfeiting methods, often utilizing reverse engineering and based on the same technology, appear.

The most sophisticated of presently available security labels generally require the use of a reader device, such as an ultraviolet or polarized light source or lenticular sheet in order to read the encrypted information that is meant to indicate that the object being protected is genuine.

None of the currently available security labels are designed to be attached to an object over a personal signature in such a way that both the signature, as well as other information embedded in a tamper proof way in the label, can be viewed by the unaided eye using natural or artificial room lighting.

Personification of the security device by allowing the incorporation of a personal signature into the label is not a feature of any known existing security label. Those methods that do consider the use of a personal signature include it within the information that is printed onto the label. For example, it is suggested in the specification of US 5,708,717 that "other

useful applications might include the latent encoding of a person's signature inside a source image consisting of that persons photograph". According to this suggestion and using the method of US 5,708,717, an interleafed image would be created that comprises, for example, a photograph that is visible under ordinary viewing and an encrypted image of the signature that can be decoded, i.e. viewed, only when viewed through a selected lenticular lens which is supplied separately from the object being protected.. The interlaced image is printed either directly on the object to be protected or can be printed on a substrate that can be attached to the object. In either case, the signature is applied to the object as a part of a printed image and not as an actual signature, written by its owner on the object.

US 6,224,109 discloses a credit card with a driver's license including a photograph of the individual positioned on the face side, additional identifying information positioned on the face side and a magnetic strip storing information providing access to credit of the individual. Although a photograph usually provides adequate identifiable information regarding the card holder, nevertheless a counterfeiter may relatively easily replace the existing photograph with his own photograph. A need therefore exists for a credit card, or any other type of identity card, that displays uncounterfeitable identifiable information.

It is the purpose of this invention to provide a simple to use, uncounterfeitable, and inexpensive to produce security means which

contains a variety of information such as logos or pictures that can be permanently attached over personal signatures and other marks on objects thus integrating the signature into the label and guarantying the authenticity of the object.

It is a further purpose of this invention to provide a security label which contains a variety of information such as logos, trade or service marks, or pictures in a limited area and which can be attached to a document or other object without obscuring any information appearing on the surface of the document or object to which the label is attached..

It is another purpose of the present invention to provide a method for protecting the authenticity of objects that does not require the use of an additional device to read either the signature or the material that is encrypted in the security means.

It is yet another purpose of this invention to provide an identity card which displays different types of identifiable information concerning the card holder such as signatures, logos, trade or service marks, or pictures, without obscuring any information.

It is an additional purpose of this invention to provide a simple to use and inexpensive to produce identity card that displays uncounterfeitable identifiable information.

Further purposes and advantages of this invention will appear as the description proceeds.

Summary of the Invention

The present invention provides a security label and a method for protecting signatures or other identifying marks or symbols from tampering, thereby guarantying the authenticity of objects to which the protected signature, identifying mark, or symbol is attached. The method consists of providing a label comprising an interlaced image printed on a transparent indicia carrier and an array of lenticular lenses suitable for viewing the at least two basic images of which the interlaced is comprised. The label is attached to the object such that it covers the signature, identifying mark, or symbol to be protected and thereby incorporates the signature into the label. Looking at the surface of the object through the lenses on the label from different viewing angles alternately reveals the original basic images of the interlaced image with the underlying signature, identifying mark, or symbol, partially visible in the background through the unprinted areas of the basic images.

According to a preferred embodiment of the invention, a clear view of the signature is obtained by making at least one of the basic images blank, i.e. containing no printed information. In this case, looking in the direction that

reveals the blank basic image, the observer will see a "window in the label" which allows a clear view of the underlying signature or mark.

In a first aspect the present invention provides a security label for protecting personal signatures and/or other identifying marks from tampering. By so doing, the label guarantees the authenticity of objects to which the signature and/or identifying marks are affixed. The label comprises an interlaced image, comprised of two or more basic images, which are printed on the bottom surface of a transparent indicia carrier. An array of lenticular lenses suitable for viewing the basic images is disposed on the top surface of the indicia carrier.

When the security label of the invention is attached to the surface of the object, such that it covers at least part of the signature and/or identifying marks, and the surface of the object is observed through the lenses on the label from different viewing angles, then the basic images of the interlaced image are alternately revealed to the observer. The underlying signature or identifying marks are visible in the background behind at least one of the basic images, i.e. the signature or mark has been incorporated into the security label.

The interlaced image of the security label of the invention can be printed in black and white, in color, or with transparent or semitransparent colors.

In a preferred embodiment of the invention, at least one of the basic images, of which the interlaced image is comprised, is blank and at least one of the basic images comprises indicia. When this embodiment of the security label is attached to the surface of the object such that it covers at least part of the signature and/or identifying marks and the surface of the object is observed through the lenses on the label from different viewing angles, then the basic images of the interlaced image are alternately revealed to the observer. The underlying signature or identifying marks are visible in the background behind the basic images comprising indicia and a clear view of the underlying signature or identifying marks is visible, through the window resulting from the blank basic image, at one of the viewing angles.

In a preferred embodiment of the invention a mask can be applied over selected lines of printing of the interlaced image to prevent the underlying signature or identifying marks from being visible in the background behind the basic images.

The thickness of the transparent indicia carrier of the security label of the invention is preferably between 50 to 200 microns and the preferred number of lenses in the array is between 75 to 250 lenses per inch. The label can be supplied in one of the forms comprising, but not limited to, the group: individually, several on a sheet of backing paper, and on rolls. The label can be attached to the object with the aid of a dispenser.

The interlaced image on the security label can be printed on the same substrate upon which the array of lenticular lenses is created or the indicia and the lenses can be created on separate substrates which are later joined to form the label.

In a preferred embodiment the security label additionally comprises an adhesive layer which can be covered by a peelable protective layer. The label is attached to the surface of the object by a method selected from, but not limited to: gluing, taping, welding, laminating, and sewing.

The security label of the invention can be attached to objects chosen from the group consisting of, but not limited to: documents, checks, doctor's prescriptions, books, CDs, perfumes, cigarettes, bottles of alcoholic beverages, autographs, memorabilia, works of art, clothing, airport security labels, access cards, bank cards, credit cards, identity cards, passports, driver's licenses, and entrance tickets.

The information printed on the security label can be chosen from the group comprising, but not limited to: pictures of an individual, personal signatures, identity numbers, addresses, company name, company logo, and trade or service marks.

The security label of the invention can be attached to the object such that it cannot be removed without damaging either the label and/or the object.

In a preferred embodiment of the invention, one or more additional interlaced images, to be viewed through a decoder, are printed on top of the main interlaced image such that the lines of printing on the main and the additional interlaced images are not parallel to each other. The printing of the additional interlaced images can be applied to the indicia carrier such that it appears to be a decorative addition to the label.

In a second aspect, the present invention provides an identity card comprising a substantially rigid substrate and a security label of the type presented in the first aspect of the invention affixed to the substrate.

The term "identity card," as referred to herein, means any card that identifies the holder thereof including, but not limited to, a credit card, debit card, membership card, driver's license, smart card, and the like.

The substrate is preferably manufactured with a recess within which the label is placed and affixed. The recess is formed within the substrate such that textual identifiable information imprinted on the front face of the card is not damaged and that a medium for storing and/or transmitting authentication and credit information regarding the card holder is accessible. The card is preferably manufactured such that it is planar and insertable within a decoder or within a reader.

In one embodiment, the identity card further comprises a layer of lamination that encompasses the substrate and label.

In another aspect the present invention provides a method for protecting personal signatures and/or other identifying marks from tampering and thereby guaranteeing the authenticity of objects to which the signatures and/or identifying marks are attached. The method comprises the following steps:

a) providing a label comprising an interlaced image printed on one surface of a transparent indicia carrier and an array of lenticular lenses created on the other surface of the indicia carrier The lenses being suitable for viewing the at least two basic images of which the interlaced image is composed;

b) attaching the label to the object such that the label covers at least part of the signature, or identifying marks; and

c) observing the surface of the object through the label from different viewing angles.

The method of the invention can further include any or all of the following steps:

a) supplying an interlaced image comprised of basic images at least one of which is blank and at least one of which comprises indicia; and/or

b) applying a mask over selected lines of printing of the interlaced image to prevent the underlying signature or identifying marks from being visible in the background behind the basic images; and/or

c) printing, on top of the main interlaced image, one or more additional interlaced images, to be viewed through a decoder, such that the lines of printing on the main and the additional interlaced images are not parallel to each other.

All the above and other characteristics and advantages of the invention will be further understood through the following illustrative and non-limitative description of preferred embodiments thereof, with reference to the appended drawings.

Brief Description of the Drawings

- Figs. 1 to 4 schematically illustrate steps in one method of creating an interlaced image according to the invention;
- Fig. 5 shows the interlaced image created according to the method shown in Figs. 1 to 4;
- Figs. 6A to 6C schematically show the optical requirements for viewing the basic images;
- Fig. 7A is a cross-sectional view which schematically shows the label according to a preferred embodiment of the invention;

- Figs. 7B and 7C are cross-sectional views which schematically show an identity card, according to a preferred embodiment of the invention, without and with a lamination layer, respectively;
- Fig. 8 schematically shows a mask printed over the interlaced image;
- Figs. 9A to 9D are front views showing the information seen by an observer viewing the document through the label of the invention from different viewing angles; and
- Fig. 10 schematically shows an embodiment of the invention that provides an extra level of security

Detailed Description of Preferred Embodiments

As is well known to experienced persons, in practice an interlaced image is created digitally using digital cameras and computers guided by appropriate software and then stored in the computer's memory to be eventually printed on a suitable substrate. The methods, hardware, and software required for producing and printing interlaced images are well known in the art and will not be discussed in detail hereinbelow for reasons of brevity.

According to the basic embodiment of the present invention, the security label is a transparent label comprising an array of lenticular lenses on the upper surface and an interlaced image printed on the bottom side. The basic images comprising the interlaced image generally, but not necessarily, contain information such as logos, trade or service marks, identity numbers, identity pictures, etc. Attaching the security label to an object over a

personal signature and looking through the label from different viewing angles, the observer will alternately see the basic images. Because, as discussed hereinbelow, blank or white areas in the basic image are transparent when printed on a transparent indicia carrier; the signature appears in the background with one of the basic images superimposed on top of it. To increase this effect, one or more of the basic images can be printed entirely using very faint colors.

In a preferred embodiment of the invention, the interlaced image comprises at least one blank basic image. Thus, when the interlaced image is printed on the bottom surface of an indicia carrier having a lenticular lens array on the top surface, the indicia carrier will contain "windows" at the location of the lines of the blank basic image through which information not on the indicia carrier can be observed. Using this embodiment an unhindered view of the underlying signature is observed through a window in the label, when the label is viewed in the direction that reveals the blank basic image.

In the remainder of this description, the invention will be described in terms of the embodiment containing the window, unless other embodiments are specifically referred to.

In order to fully appreciate the novelty of the present invention, one method of creating an interlaced image comprised of three separate basic images, one of which is blank, is demonstrated in Figs. 1 to 5.

In Fig. 1 is shown one of the basic images, in this case house 1, and in Fig. 2 the second basic image, automobile 2. The images in Figs. 1 and 2 are recorded graphically or with a digital camera and stored in the memory of a computer.

In the next step in creating the interlaced image, shown in Figs. 3 and 4, the sizes of both basic images are adjusted resulting in two images having equal height H and width W. Each of the basic images is then electronically cut into n equal strips, referred to as lines. Each of the resulting n lines for each of the images having height H and width w, where w = W/n is defined as the pitch of the interlaced image. In the present example, for simplicity and clarity, n is chosen to be 20 and the lines of images 1 and 2 are labeled respectively A1-A20 and B1-B20. The computer also generates blank lines C1-C20 corresponding to blank image C and having the same dimensions as those for images A and B.

Following instructions provided by the software, the computer then merges the information contained in the three basic images into a single combined image (computer file) by arranging the sixty strips of width w/2 in the order A1, B1, C_1, A2, B2, C_2.... A_{20}, B_{20}, C_{20} to form the combined image 3, shown schematically in Fig. 5. Image 3 has the same height H as each of the original images and width 3W.

Finally, the width of the combined image is compressed uniformly to W, before printing the interlaced image, in order to retain the proper proportions in the images that will be observed when looking at the interlaced image through the lenticular sheet.

The substrate on which the interlaced image is printed is known as an "indicia carrier". In the present invention the substrate that contains the lens array on one surface and the printing on the opposite surface must be made of a transparent material. Substrates suitable for use in creating security labels according to the invention include a wide range of readily available plastics. Stiff material can be selected for some applications however if the label is to be attached to a flexible item such as sheets of paper, articles of clothing, etc., a soft flexible indicia carrier, preferably made from a thin film having thickness in the range of 50 to 200 microns should be used.

Additionally other methods of interlacing, such as creating a two-dimensional array of pixels, are well known in the art and can be modified, *mutatis mutandis*, to the requirements of the present invention.

In order to be able to see the basic images that have been interlaced on the indicia carrier, the interlaced image is viewed through a lenticular array of lenses that have the same general configuration as the lines of printing. For example, an array of linear cylindrical lenses is used for viewing the

interlaced images shown in Fig. 5 and a two-dimensional array of spherical lenses is used for interlaced images comprising a two-dimensional array of pixels. If the requirements listed hereinbelow for a lenticular display are met, then the basic images are alternately displayed by changing the viewing angle of the interlaced image through the lenses or by causing relative motion, in a controlled manner, between the interlaced image and the lenses.

The fundamental requirements of a lenticular display are the following:

1. The pitch of the interlaced image must be essentially equal to the pitch of the lenses.
2. The distance between the interlaced image and the lenses must be constant and essentially equal to the focal length of the lenses.
3. Exact alignment between the interlaced image and the array of lenses must be established and maintained; e.g., in the case of the interlaced images shown in the Fig. 5, the long axis of the printing on the indicia carrier must be essentially parallel to the long axis of the cylindrical lenses.

These requirements and methods of satisfying them are well known in the art and will not be further discussed herein for reasons of brevity.

Figs. 6A to 6C schematically show the optical requirements for viewing the basic images. Lenticular lens array **22** is created and interlaced image **20** is printed on opposite faces of indicia carrier **21.** The distance between the

printing and the lenses (designated in the figures by the letter **f**) is constant and essentially equal to the focal length of the cylindrical lenses that comprise the array. The interlaced image is comprised of three basic images A, B, and C. The pitches, w, of both the printed interlaced image and of the lenses are equal. Looking from a distance through the lenses in the directions A', B', and C' will alternatively reveal basic images A, B, and C to the observer. The dashed lines in Figs. 6A to 6C show the paths of the rays that pass through the edges of each of the lenses and are focused on the printing. The bold lettering A_n, A_{n+1}, etc. indicates the image of line A_n, etc. of the interlaced image (refer to Fig. 5) that is viewed through the nth lens of the array.

As described above, the preferable method of producing the labels of the invention is to print the interlaced image directly on one surface of a substrate that contains a previously created array of lenses on the other surface, however other methods exist. For example, the interlaced image can be printed on a separate indicia carrier that is then attached by a suitable method, such as gluing, to a lenticular lens array that has been created on its own substrate.

According to a preferred embodiment of the present invention, the lenticular system is supplied in the form of a lenticular self-sticking label comprising the indicia carrier, lenses, and means to attach it to a surface as an integrated unit. The indicia carrier is prepared by printing an interlaced

image containing two or more basic images on one side of a transparent material. In the preferred embodiment at least one of the basic images is blank and at least one contains indicia. The material has an array of lenticular lenses created on the front side that is suitable for viewing the images and has a thickness essentially equal to the focal length of the lenses in the array. On the external side of the indicia carrier is added an adhesive layer, on the outer side of which is preferably attached a peelable protective layer.

The label typically has an area of several cm^2 and, as discussed hereinabove, preferably a thickness of 50 to 200 microns. The thickness of the label, i.e. the focal length of the lenses, depends on their pitch with higher pitches having a shorter focal length. Typical pitches for the lenses (and printing) used in the labels of the invention are 75 to 250 lines per inch.

The methods of printing the interlaced image and creating the array of lenticular lenses as well as the criterion for choosing the type of transparent material and adhesive appropriate for a particular application are well known to skilled persons and therefore need not be discussed herein. It is also to be noted that, although the label is described herein as being self-sticking, it is not essential that the adhesive be an integral part of the label. The label can be affixed to the object by any suitable means, including, but not limited to, gluing, taping, welding, laminating, and sewing.

To make use of the label of the invention, a person applies his signature or other sign to an object, for example a document, check, prescription, identity card, etc. and then peels off the protective layer and attaches the lenticular label to the document on top of his signature by means of the adhesive layer. Viewing the surface of the object through the label from different angles, an observer will alternatively see, for example, a health fund's name, its logo, and the signature of a physician.

In Fig. 7A is shown a cross-sectional view which schematically shows the label of the invention **30** described hereinabove. Label **30** comprises the interlaced image **20** which is printed on the bottom side of the indicia carrier **21**, having lenticular lenses **22** on the top side, and adhesive layer **31**, below the printing. Label **30** is attached to document **32**, over the personal signature of the author, by means of adhesive layer **31**.

In Fig. 7B is shown a cross-sectional view which schematically shows the label of the invention, which was described hereinabove with relation to Fig. 7A. Label **30** is attached to rigid substrate **34** in order to create an identity card. The label is affixed over the personal signature and/or photograph of the card holder and/or other information by means of adhesive layer **31**. It will be appreciated that the identity card of the invention is capable of displaying more identifiable visual information regarding the card holder than is possible with prior art identity cards. In order to prevent fraudulent

replacement of the security label, adhesive layer **31** is preferably composed of a material that causes irreversible damage to substrate **34**, or the information printed on it, whenever label **30** is removed.

In Fig. 7B is schematically shown the preferred embodiment of the identity card of the invention. In this embodiment, label **30** is attached in a recess that is created in the surface of the substrate **34**.

Protection of the card against mechanical damage and also against counterfeiting is achieved by the addition of lamination layer **36** over the entire card including label **30** as shown in Fig. 7C. The laminated identity card in accordance with the present invention is preferably thin and planar, so that it may be insertable within a suitably sized decoder.

One characteristic of the printing processes used to produce the labels of the invention is that they automatically equate the color white in the image being printed with the color of the substrate on which they are printed. This means that areas that are white in any the basic images will be transparent in the printed interlaced image. As discussed hereinabove, when the label is then attached to a document over a signature, the signature will be seen clearly when viewed through blank basic images and will appear in the background of the other basic images. This has advantages for security purposes, as discussed hereinbelow, but can be annoying if one wishes to observe clearly the information contained in the basic images of which the

interlaced image is comprised. In order to allow selected images to be observed without interference from the signature or other information located under the label, a mask is printed over the lines of the non-blank basic images in the printed interlaced image. The use of a mask is shown in Fig. 8. White lines 23 are printed over the lines corresponding to images A and B. Thus when looking through the label in direction C', the signature will be seen; and, when looking in either of the other two directions, the respective basic image will be seen with a white background.

Figs. 9A to 9D are front views of a signed document having a label attached over the signature. The label is the embodiment described with reference to Figs. 6A to 6C. Figs. 9A, 9C, and 9D respectively show the information seen by an observer viewing the document from the corresponding viewing angles as indicated in Figs. 6A to 6C. Fig. 9B shows one of the non-blank basic images (corresponding to Fig. 9A) observed through a label printed as described with respect to Fig. 8. In the figures a circular label is shown, but as will be apparent to the skilled person, any shape of label can be used, such as square, oval, irregular, etc.

As another example, particularly suited for use with identity cards, the label of the invention can be comprised of an interlaced image composed of three basic images: a blank image, a second image that is a person's picture, and a third image that is his identity number. Attaching the label over the

personal signature of the individual will alternately reveal the signature, picture, and identity number of the card holder.

The labels of the invention can be produced in black and white or color. Also, although the examples given hereinabove are for interlaced images comprised of three basic images, interlacing of even more images is easily accomplished with present day printing methods. For example, a label containing an interlaced image comprised of a blank image, front, right profile, and left profile photographs can be produced to be attached over a persons signature on an identity card. In this manner even more information, which can be viewed with the unaided eye, is made available. This feature is especially useful for items such as credit or identity cards where it is necessary to place a large amount of information in a limited area without obscuring other information on the card.

The labels of the invention can be provided in many forms, for example individually or several on a sheet of backing paper, which are peeled off one at a time and attached manually to an item or document, or on rolls suitable to be used with a dispenser, such as that used to attach price labels in supermarkets.

The labels of the invention are virtually impossible to counterfeit. In order to reproduce the label a would-be counterfeiter needs clear images of the individual basic images. These are virtually impossible to obtain by

photographing an existing label because of the presence of the lenses on the surface of the label. Also, as discussed hereinabove, the background upon which the label is attached will show through all the images on the label blocking any possibility of producing "clean" photographs of the basic images. Thus a counterfeiter would have to have access to all of the original basic images, which if stored securely in separate locations, can become an insurmountable difficulty. In addition to difficulties in obtaining the images, a counterfeiter also needs experience in lenticular technology and access to and skill in using the equipment and software necessary to produce the interlaced images and final label. Skilled persons will additionally be able to provide additional security features such as use of an adhesive having properties that will not allow the label to be removed from the object to which it is attached without substantially damaging either the label or the object, thereby making it impossible to alter the information covered by the label.

In Fig. 10 is schematically shown an embodiment of the invention that provides an extra level of security. Fig. 10 shows the interlaced image **3** of Fig. 5 printed on the indicia carrier. In the upper right corner is area **40**, in this case a circle, in which is printed an additional interlaced image. The lines D_1, D_2, D_3, etc. in area **40** are printed on top of and at right angles to those of the main interlaced image. The interlaced image of area **40** is preferably comprised of one basic image and two or three blank images to minimize visibility and interference with the main images on the label. The

step of printing this extra interlaced image involves very little additional time or labor and therefore adds virtually no additional cost to the price of the labels.

The information in area 40 is read by a decoder, which is nothing but a lenticular lens sheet of appropriate thickness and pitch that is held over area 40 and rotated until the image is visible. With the printing of area 40 orthogonal to that off the main image, it is virtually unobservable without the decoder. If desired, the printing of the additional interlaced image (area 40), or areas, can be applied to the indicia carrier, such that it appears, to the unaided eye, to be a decorative addition to the label and is revealed to be the selected image only when observed using the decoder.

The additional level of security provided by this embodiment can be influenced by manipulating many different factors including, but not limited to:

- area 40 can be of any size or shape; there can be more than one such area on the label;
- the one or more areas can be located at any predetermined location on the label;
- the lines of printing need not be orthogonal to those of the main images, but can be printed at any non-zero angle to them;
- any print pitch, not necessarily that of the main interlaced image, can be used as long as a decoder having the same pitch is provided.

An illustrative, but nonlimitative list of applications in which the security label of the invention can be applied includes:

- Protecting personal signatures on documents, checks, doctors prescriptions, etc.;
- Protecting personal items, such as books;
- Protecting commercial items, such as CDs, perfumes, cigarettes, and bottles of alcoholic beverages;
- autographs of sports stars, musicians, politicians, and other celebrities;
- Protecting memorabilia of all types;
- Protecting art works such as paintings, tapestries, etc.;
- Protecting clothing such as designer jeans, dresses, etc.
- For airport security labels placed on passenger luggage;
- On cards used for access to restricted areas, bank, and credit cards;
- On official documents such as passports, identity cards, and drivers licenses; and
- For authenticating entrance tickets to theaters, sporting events, etc. The information on the label can be a logo, name of the sports club, stadium, etc. and it can be placed over any of the information that conventionally is printed on the ticket so that, for example, on one night the date can be read through the label and on the following night a serial number or other information, thereby supplying an additional element of security, since a would be counterfeiter would

not be able to know the exact placement of the security label in advance.

The labels and identity cards of the invention may be mass-produced in the manner well known to those skilled in the art. For the identity cards two manufacturing lines may be in operation simultaneously: one for producing and stamping the cards and the other for producing the labels. The two manufacturing lines operate in coordination one with the other, so as to optimally produce the identity card of the invention. For example, each card can be manufactured with a recess within which a label is placed and affixed. Also, the layout of the card is predetermined, so as to allow for the addition of the security label. That is, the security label is positioned such that it will not interfere with the textual identifiable information imprinted on the front face of the card, or with a magnetic strip, or any other medium, e.g. a microprocessor, for storing and/or transmitting authentication and credit information regarding the card holder, which is usually accessible to the rear face of the card.

Although embodiments of the invention have been described by way of illustration, it will be understood that the invention may be carried out with many variations, modifications, and adaptations, without departing from its spirit or exceeding the scope of the claims.

Claims

1. A security label for protecting personal signatures and/or other identifying marks from tampering and thereby guaranteeing the authenticity of objects to which said signatures and/or identifying marks are affixed; said label comprising an interlaced image, comprised of two or more basic images, printed on the bottom surface of a transparent indicia carrier and an array of lenticular lenses suitable for viewing said basic images disposed on the top surface of said indicia carrier ;

   wherein, when said security label is attached to the surface of said object such that it covers at least part of said signature and/or identifying marks and said surface of said object is observed through said lenses on said label from different viewing angles, the basic images of said interlaced image are alternately revealed to the observer with said underlying signature or identifying marks visible in the background behind at least one of said basic images, thereby incorporating said signature or said mark into said security label.

2. A security label according to claim 1, wherein at least one of the basic images, of which the interlaced image are comprised, is printed using very faint colors.

3. A security label according to claim 1, wherein at least one of the basic images, of which the interlaced image is comprised is blank and at least one of said basic images comprises indicia;

and wherein, when said security label is attached to the surface of said object such that it covers at least part of said signature and/or identifying marks and said surface of said object is observed through said lenses on said label from different viewing angles, the basic images of said interlaced image are alternately revealed to the observer, with said underlying signature or identifying marks visible in the background behind at least one of said basic images comprising indicia and with a clear view of said underlying signature or identifying marks visible, through the window resulting from said blank basic image, at one of said viewing angles.

4. A security label according to claim 1, wherein the thickness of the transparent indicia carrier is between 50 to 200 microns.

5. A security label according to claim 1, wherein the interlaced image is printed on the same substrate upon which the array of lenticular lenses is created.

6. A security label according to claim 1, wherein the interlaced image is printed on a substrate which is attached to another substrate upon which an array of lenticular lenses has been created.

7. A security label according to claim 1, additionally comprising an adhesive layer.

8. A security label according to claim 7, additionally comprising a peelable protective layer.

9. A security label according to claim 1, wherein the pitch of the lenses is between 75 to 250 lenses per inch.

10. A security label according to claim 1, wherein the label is attached to the surface of the object by a method selected from:

- gluing;
- taping;
- welding;
- laminating; and
- sewing.

11. A security label according to claim 1, wherein the object is selected from the group consisting of:

- documents;
- checks;
- doctor's prescriptions;
- books;

- CDs;
- perfumes;
- cigarettes;
- bottles of alcoholic beverages;
- autographs;
- memorabilia;
- works of art;
- clothing;
- airport security labels;
- access cards;
- bank cards;
- credit cards;
- identity cards;
- passports;
- driver's licenses; and
- entrance tickets.

12. A security label according to claim 1, wherein a mask is applied over selected lines of printing of the interlaced image to prevent the underlying signature or identifying marks from being visible in the background behind the basic images.

13. A security label according to claim 1, wherein the information printed on said label is selected from the group comprising:

- pictures of an individual;
- personal signatures;
- identity numbers;
- addresses;
- company name;
- company logo; and
- trade or service marks.

14. A security label according to claim 1, wherein said label is printed in black and white.

15. A security label according to claim 1, wherein said label is printed in color.

16. A security label according to claim 1, wherein said label is printed in transparent or semitransparent colors.

17. A security label according to claim 1, wherein the label is supplied in one of the forms comprising the following group:

- individually;
- several on a sheet of backing paper; and
- on rolls.

18. A security label according to claim 1, wherein said label is attached to the object with the aid of a dispenser.

19. A security label according to claim 1, wherein the label cannot be removed from the object without damaging either said label and/or said object.

20. A security label according to claim 1, wherein one or more additional interlaced images, to be viewed through a decoder, are printed on top of the main interlaced image such that the lines of printing on said main and said additional interlaced images are not parallel to each other.

21. A security label according to claim 20, wherein the printing of the additional interlaced images is applied to the indicia carrier such that it appears to be a decorative addition to said label.

22. An identity card comprising a substantially rigid substrate and a security label affixed to said substrate suitable for displaying different images of identifiable information, said label comprising an interlaced image, comprised of two or more basic images, provided on the bottom surface of a transparent indicia carrier and an array of lenticular lenses suitable for viewing said basic images disposed on the top surface of said indicia carrier ;

wherein, the basic images of said interlaced image are alternately revealed to an observer, depending on an angle of view.

23. Identity card according to claim 22, wherein the substrate is manufactured with a recess within which the label is placed and affixed.

24. Identity card according to claim 23, wherein the recess is formed within the substrate such that textual identifiable information imprinted on the front face of the card is not damaged and that a medium for storing and/or transmitting authentication and credit information regarding a card holder is accessible.

25. Identity card according to claim 24, further comprising a layer of lamination encompassing the substrate and label.

26. Identity card according to claim 22, wherein the card is insertable in a decoder or within a reader.

27. Identity card according to claim 22, wherein at least one of the basic images, of which the interlaced image is comprised, is blank and at least one of said basic images comprises indicia;

and wherein, when said security label is attached to the substrate such that it covers at least part of a signature and/or identifying marks, the basic images of said interlaced image are alternately revealed to the

observer, with said underlying signature or identifying marks visible in the background behind at least one of said basic images comprising indicia and with a clear view of said underlying signature or identifying marks visible, through the window resulting from said blank basic image, at one of the viewing angles.

28. Identity card according to claim 22, wherein the label is attached to the substrate by an adhesive layer and said adhesive layer is composed of a material that causes irreversible damage to the card during removal of the label from the substrate.

29. Identity card according to claim 1, wherein the label is affixed to the substrate by a method selected from:

- gluing;
- taping;
- welding;
- laminating; and
- sewing,

or by a combination of two or more of such methods.

30. Identity card according to claim 22, wherein the information printed on said label is selected from the group comprising:

- pictures of an individual;
- personal signatures;

- identity numbers;
- addresses;
- company name;
- company logo; and
- trade or service marks.

31. Identity card according to claim 22, wherein the label is printed in black and white.

32. Identity card according to claim 22, wherein the label is printed in color.

33. A method for protecting personal signatures and/or other identifying marks from tampering and thereby guaranteeing the authenticity of objects to which said signatures and/or identifying marks are attached said method comprising the following steps:

a) providing a label comprising an interlaced image printed on one surface of a transparent indicia carrier and an array of lenticular lenses created on the other surface of said indicia carrier, said lenses being suitable for viewing the at least two basic images of which said interlaced image is composed;

b. Attaching said label to said object such that said label covers at least part of said signature, or identifying marks; and

c. observing the surface of said object through said label from different viewing angles.

34. A method according to claim 33, wherein at least one of the basic images, of which the interlaced image is comprised, is blank and at least one of said basic images comprises indicia.

35. A method according to claim 33, further compromising applying a mask over selected lines of printing of the interlaced image to prevent the underlying signature or identifying marks from being visible in the background behind the basic images.

36. A method according to claim 33, further compromising printing, on top of the main interlaced image, one or more additional interlaced images, to be viewed through a decoder, such that the lines of printing on said main and said additional interlaced images are not parallel to each other.

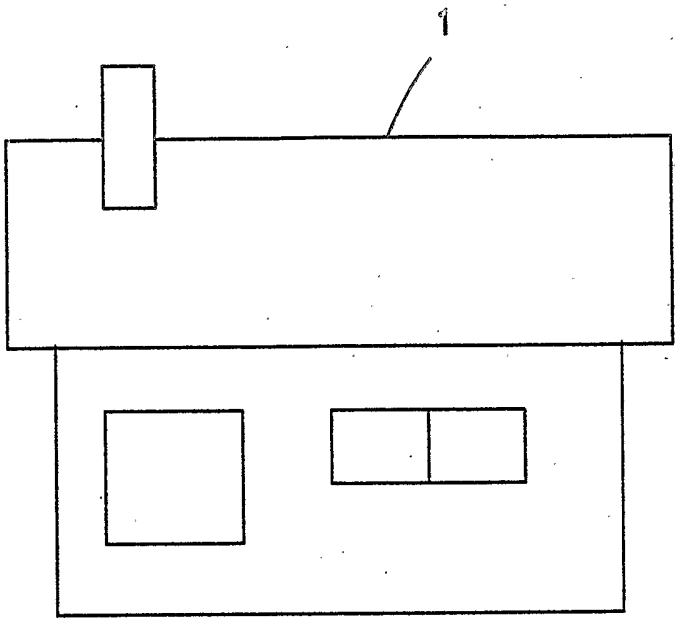

Fig. 1

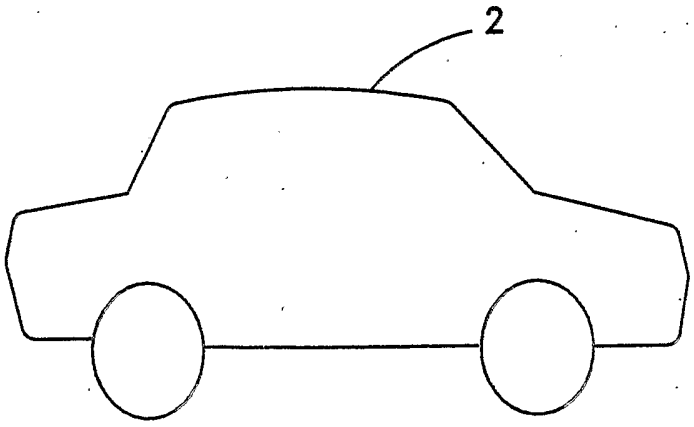

Fig. 2

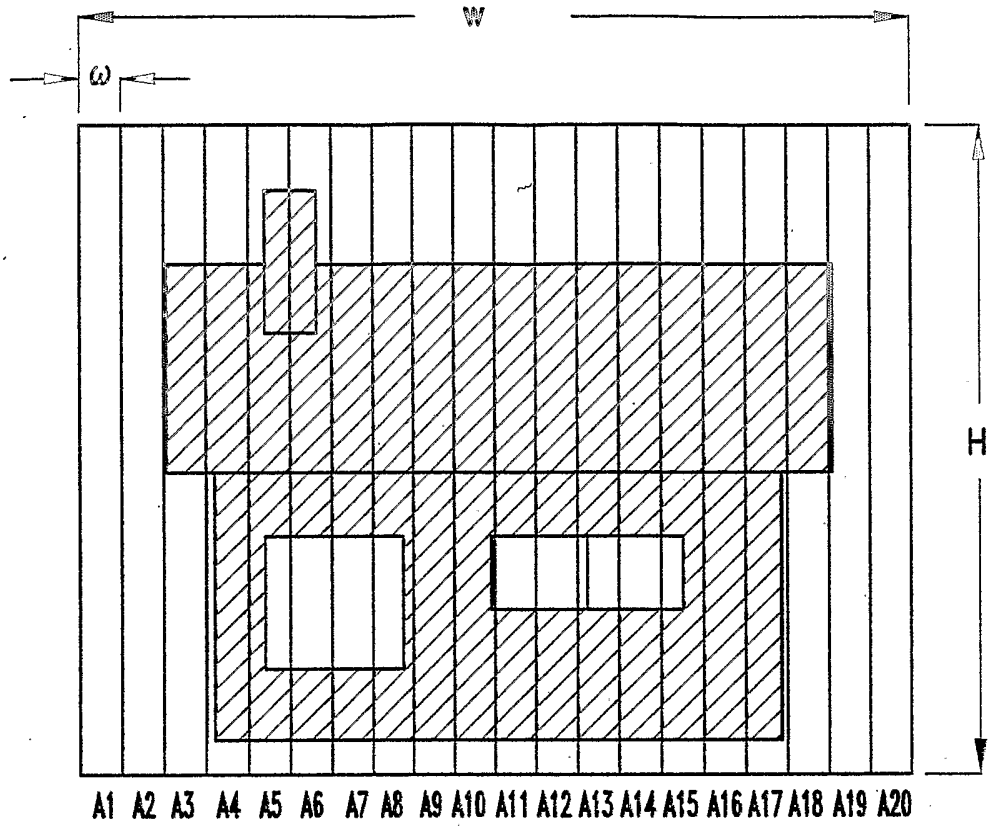
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Fig. 3

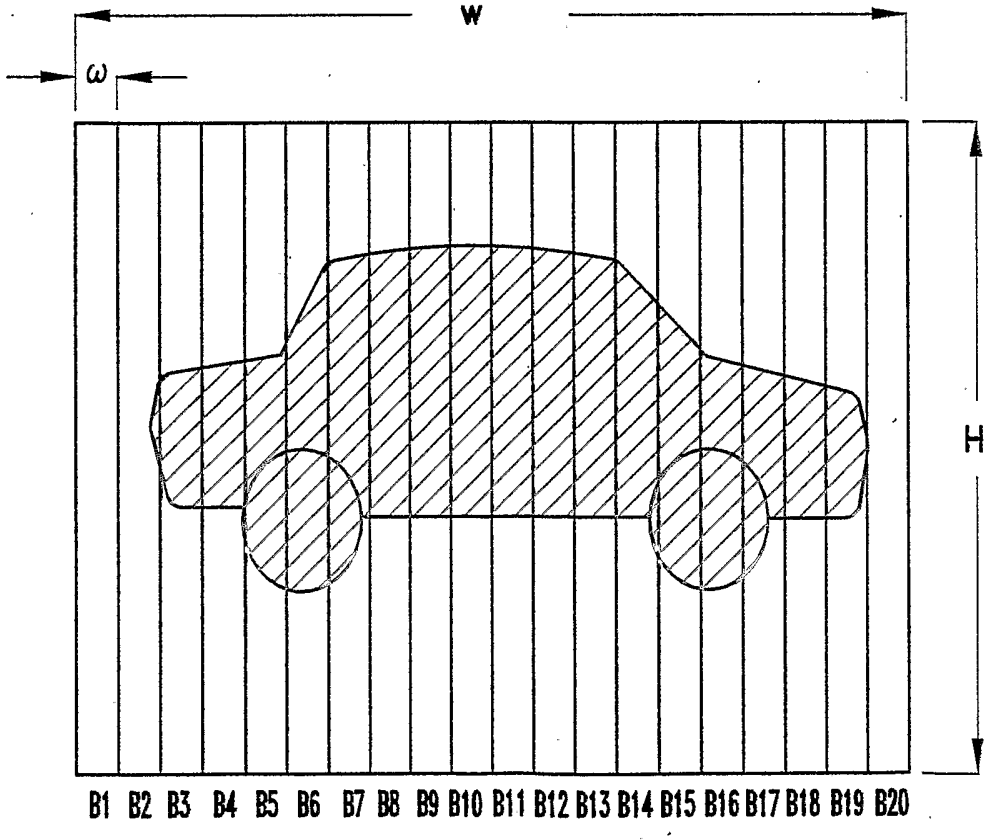
W
ω
H
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Fig. 4

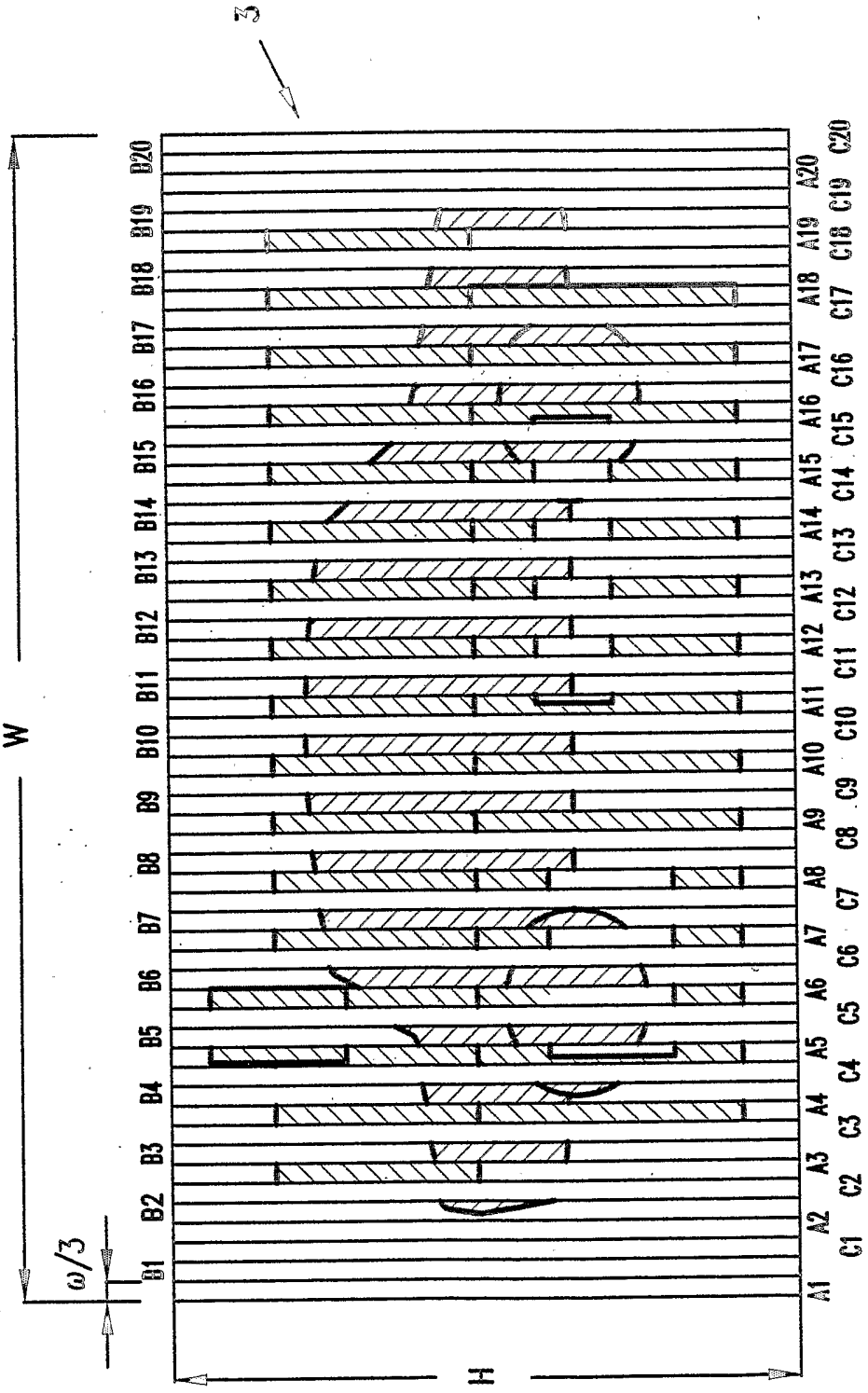

5
W
H
ω/3
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20
C1 A2 C2 A3 C3 A4 C4 A5 C5 A6 C6 A7 C7 A8 C8 A9 C9 A10 C10 A11 C11 A12 C12 A13 C13 A14 C14 A15 C15 A16 C16 A17 C17 A18 C18 A19 C19 A20
A1

Fig. 5

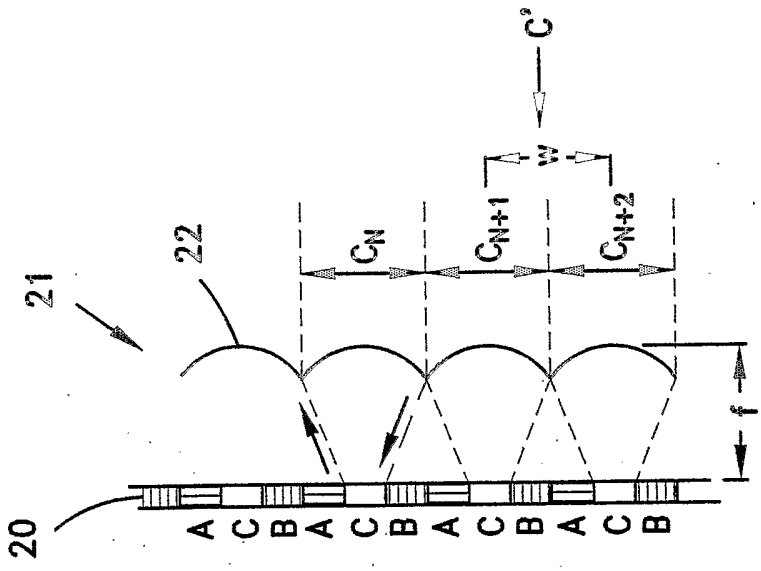


Fig. 6C

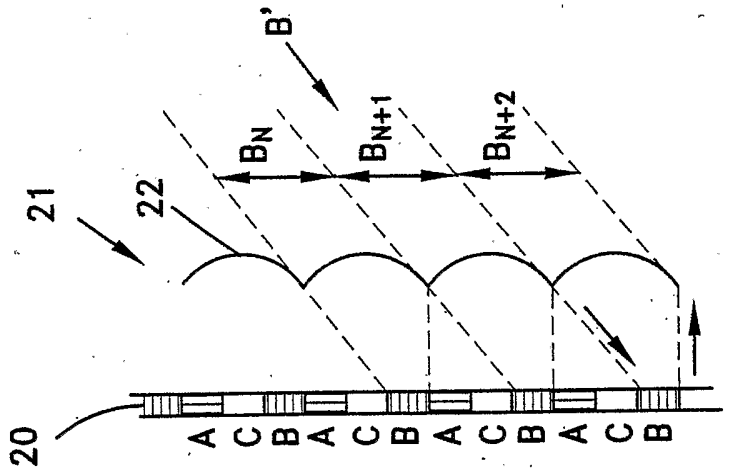


Fig. 6B

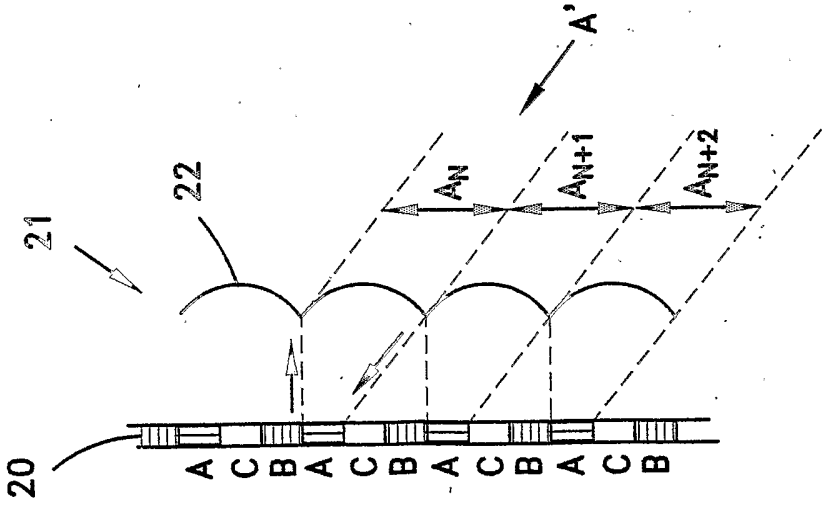


Fig. 6A

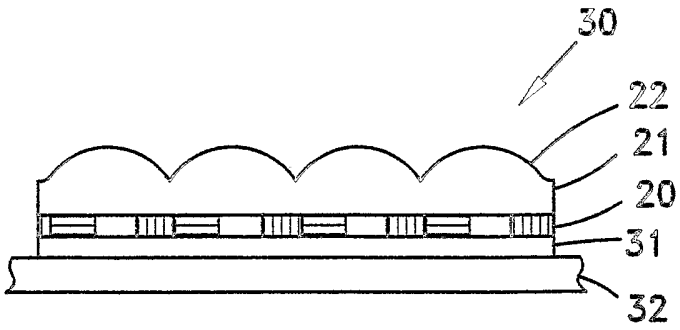


Fig. 7A

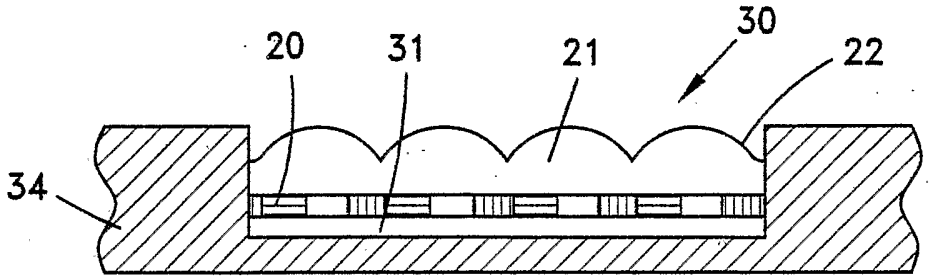


Fig. 7B

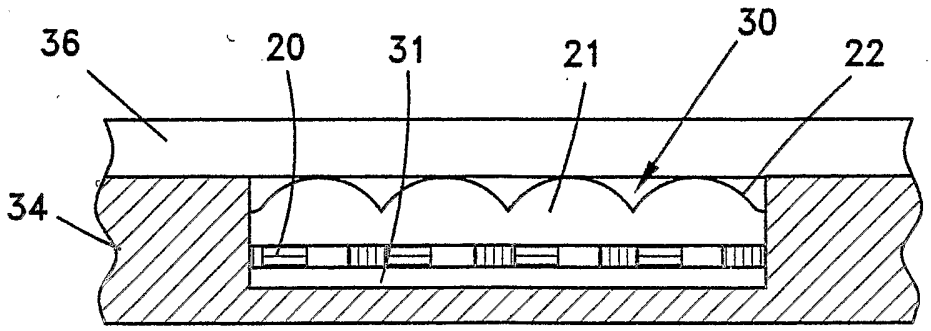


Fig. 7C

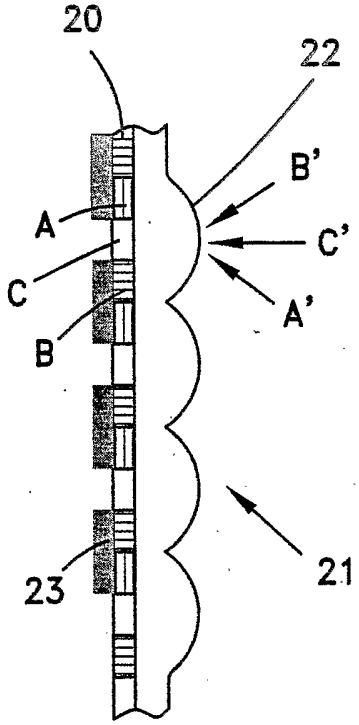


Fig. 8

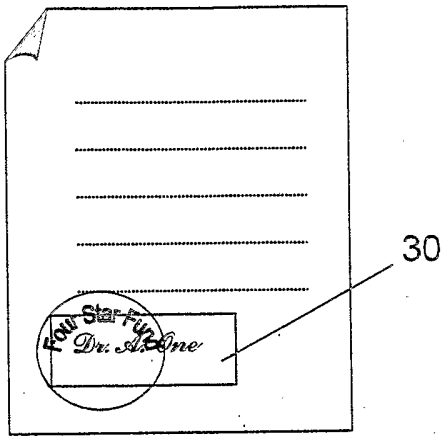


Fig. 9A

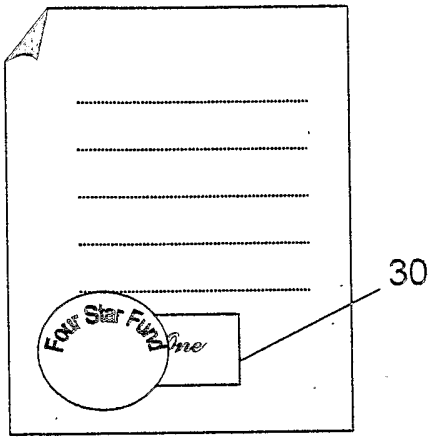


Fig. 9B

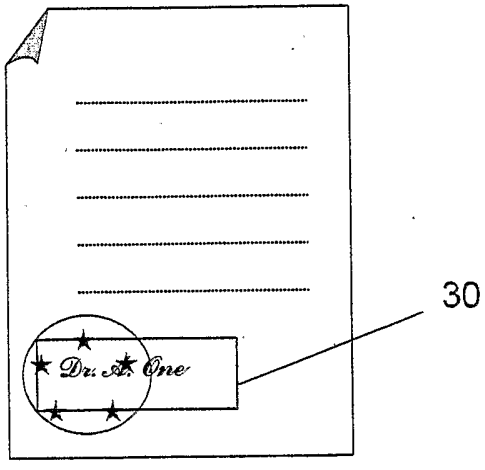


Fig. 9C

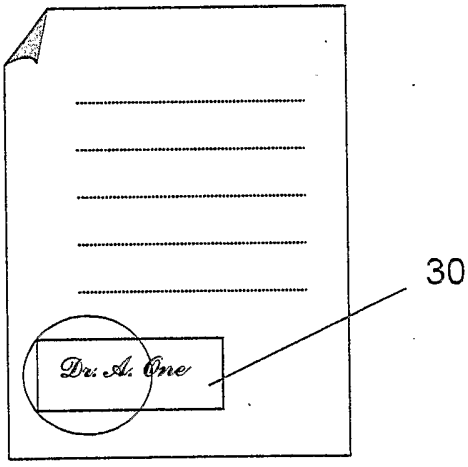
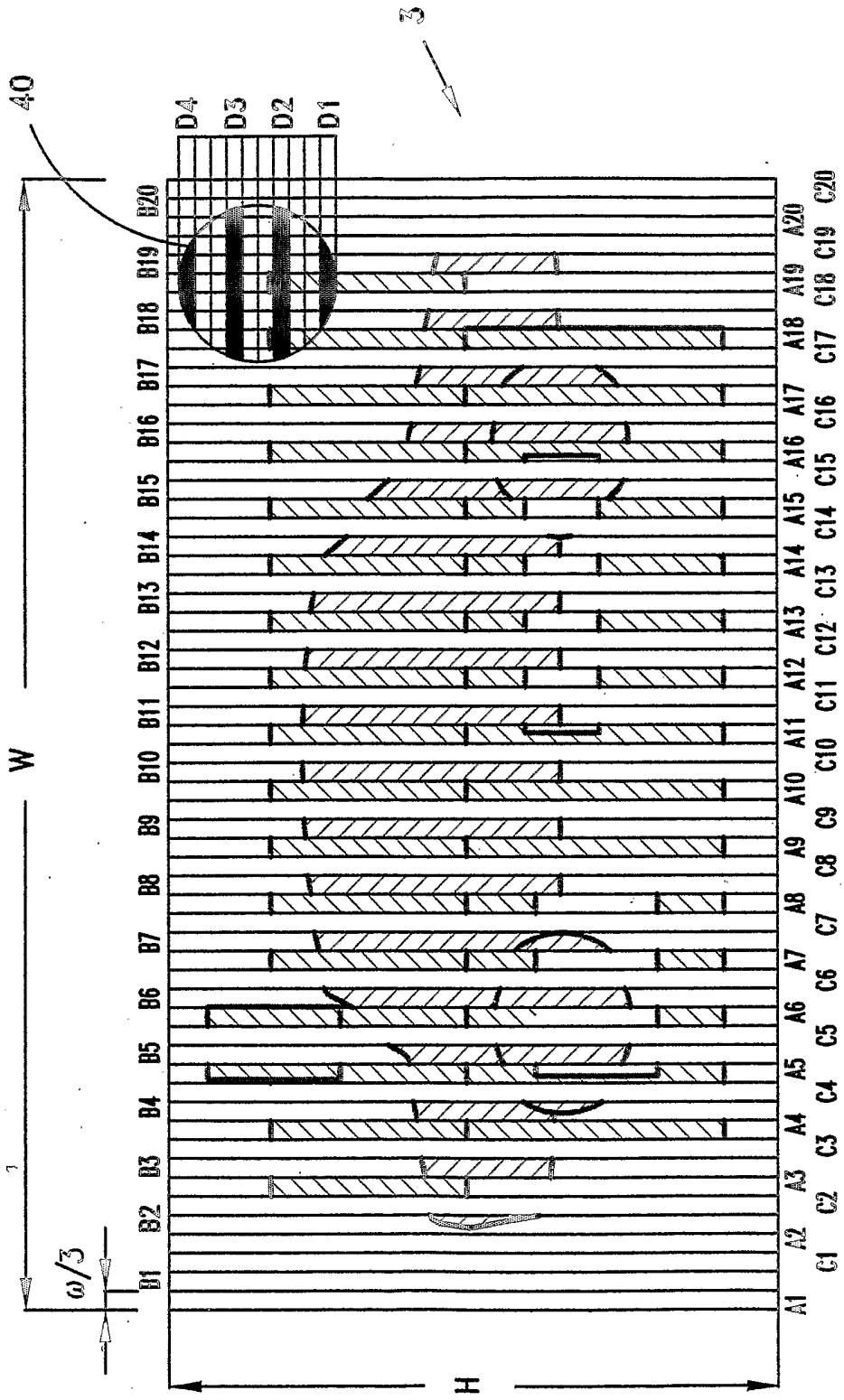


Fig. 9D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D3
D2
D1
W
H
ω/3
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A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20

Fig. 10