PATENT SPECIFICATION (11) 1 576 168

1 576 168

(21) Application No. 52747/77 (22) Filed 19 Dec. 1977

(31) Convention Applictation No. 9728/76 (32) Filed 28 Dec. 1976 in

(33) Austria (AT)

(44) Complete Specification Published 1 Oct. 1980

(51) INT. CL.[3] B32B 31/20 3/30 33/00

(52) Index at Acceptance
B5N 0308 0330 2710 2730 3120 3300
B6A GA

(54) METHOD FOR MAKING MULTILAYER IDENTIFICATION CARDS

(71) We, G.A.O. GESELLSCHAFT FÜR AUTOMATION UND ORGANISATION MBH, a German Company, of Munich, Euckenstr. 12, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the following method by which it is to be performed, to be particularly described in and by the following statement:-

The present invention relates to a method for laminating multilayer identification cards with a surface in relief.

For the manufacture of multilayer identification cards and the like, various methods are known. To manufacture identification cards with a plane surface, for example, use is made of two transparent thermoplastic films between which a paper blank is embedded on which all identification-card data, a passport photograph, and the like, are imposed. In a single operation, the two outer layers and the information-carrying layer are so compressed under heat between two plane steel plates that the thermoplastic films, which become slightly softened, penetrate into the pores of the paper and combine with the paper. Since the surfaces of the steel plates are plane, the surfaces of the identification cards become plane, too. Such cards with plane surfaces are very well suited for quantity manufacture, but their surfaces have no characteristics whatsoever which could prevent or show any attempted forgery and/or tampering. In addition, the glossy card surface adversely affects the readability of the card data due to reflections under certain lighting conditions.

To make it difficult to detach and reapply the transparent films, identification cards are known which have a raised seal, preferably in the picture of signature area. To manufacture such identification cards with raised patterns, the laminating apparatus is equipped with steel plates, for example, in which accurately positioned embossing dies are formed. Since the outer films become soft during the laminating process due to the applied heat, the embossing dies leave a permanent impression on the films (U.S. Patent 3,533,176).

These identification cards have the disadvantage that, by reheating, the thermoplastic films can be "ironed" again and provided with new impressions at any time.

To avoid these disadvantages, identifications cards have been provided in which the paper blank is a security paper and in which the thickness differences of the paper blank, which are caused by watermarks, a safety thread, steel print, and the like, are visually, mechanically, and manually recognizable and detectable on the surface of the finished identification card. In such identification cards, the surface structure cannot be imitated by simple impression, and as a result of the manufacturing process being divided into different steps, subsequent attempts at lamination will be unsuccessful. Despite this very high security against forgery and tampering, however, the wish for direct application to the card surface of similar raised patterns and particularly steel print has so far gone unfulfilled for lack of a suitable laminating technique. This is true particularly if signature strips provided with sensitive steel print or paper or film strips provided with similar relief print and intended for other purposes are to be laminated directly on to the surface of the identification card by the conventional laminating techniques. The inflexibility of the steel plates and the high laminating pressure damage the raised portion of the surface pattern in such a way that the quality of the identification cards so manufactured will not be satisfactory for the intended purpose of permitting easy verification of the authenticity of the card.

Accordingly, the object of the invention is to provide a method for laminating multilayer identification cards which, besides making possible the known designs, permits

counterfeitproof raised surface patterns to be applied directly to the outer card surface.

According to the invention, this object is achieved by inserting an elastic intermediate layer between an outer layer of the card and a hard laminating plate of the laminating apparatus.

A particular advantage of the method according to the invention lies in the fact that, on the one hand, the raised surface patterns produced by steel printing or the like are fully preserved, while, on the other hand, the smooth, parallel areas of the card can have the quality of conventional cards. For example, laminated paper strips provided with relief print are sunk seamlessly into the thermoplastic outer film and are thus protected against manipulatory detachment without any damage to the relief print being perceptible.

Through the special surface finish of an elastic intermediate laminating layer according to one embodiment of the invention, a natural surface roughness can be produced on the layers covering the card. As a result of this surface roughness, the film surface is hardly distinguishable from the surface of a paper strip laminated on to the film. Identification cards of such design, in addition to giving a more homogeneous general impression, permit better data recognition since they are non-reflecting.

An embodiment of the invention will now be explained in more detail with reference to the accompanying drawings, in which:-

Figure 1 is a top view of an identification card;

Figure 2 is a section taken along line A-B of Figure 1;

Figure 3 is a schematic representation of the individual, superimposed layers of the identification card prior to lamination, and

Figure 4 is a schematic representation of the layers during lamination.

Identification and credit cards of PVC materials are manufactured almost exclusively in laminating installations, where the layers to be laminated are compressed stationarily between laminating plates. The compressing methods are mostly aimed at producing smooth surfaces of the laminate which are achieved by covering the layers with plane, highly polished steel or hard-brass plates or chromium-plated steel plates, it being possible to laminate one or more layers. Experience has shown that the use of such cover plates during lamination guarantees a completely flawless film surface.

To preserve the raised surface pattern, one embodiment of apparatus according to the invention starts from the fact that on each of the sides to be protected, an elastic intermediate layer (e.g. silicon) is inserted between the respective laminating plate and the layers to be laminated.

Figures 1 and 2 are top and sectional views, respectively, of an identification card made with the apparatus according to the invention. For the manufacture of the identification card 1, a paper blank 2 made from the point of view of compliance with requirements for securities is covered on both sides with films 3, 4. The surface of the upper cover film is provided with a paper element positioned relative to the printed matter 5 on the face of the blank and serving, for example, as a signature strip 6 for the subsequently laminated card. Instead of printing the signature strip by the conventional technique, i.e. surface printing, portions of this area are provided with steel print.

Steel printing can be done with commercially unavailable, but known printing machines as are used in the manufacture of bank notes. Very fine line patterns are printed on the surface of the paper in the manner of a relief. The relief 7 is formed by suitable color accumulations. Relief-like projections can also be obtained with other methods, e.g. by blind embossing of a paper.

The relief print obtained in either of the two aforementioned ways or by another technique producing the same effect must be so treated by a laminating technique with respect to its clearly visible and feelable relief effect that its structure is largely preserved after the lamination, and the printing carrier (signature strip) must be sunk seamlessly into the film surface. The printing carrier to be embedded by lamination need not be of paper but may also be a film.

To preserve the relief-like structure of the steel print on the surface of the upper layer during the laminating process, according to the invention, a modified covered laminating plate is used for this surface (Figures 3 and 4). The covered laminating plates 8, 9 are designed so that the high compressive load placed by the upper laminating plate 8 on the relief surface 7 of the upper layer results in a uniform distribution of forces. This means that the application of forces is not concentrated on the raised portions of the relief as is the case with the use of plane laminating cover plates made of steel or the like, but that the forces are applied uniformly over the entire relief surface. To accomplish this, a lamination plate 8 of steel or hard brass is covered on one side with an approximately 0.5 to 2 mm thick silicon mat 9. This can be done by vulcanization or by bonding the silicon mat layer 9 to the plate 8 with a thermally and pressure stable silicon adhesive. The mat 9 may also be introduced without being attached to the plate 8. The mat 9 preferably has plane-parallel sides, and its surface structure is homogeneous.

To achieve dynamic adaption of the silicon mat to the surface of the material to be lami-

nated, the silicone advantageously has a medium Shore hardness. Preferred hardnesses range from 30 to 70 Shore.

By the use of silicon-covered laminating plates with a matt surface, the image of the surface structure of the silicon is produced on the surface of the laminate.

This effect results in a matt, non-reflecting paper-like film surface. In addition, when viewing the paper blank lying below the film, a highly transparent impression is created.

To manufacture the silicon mat with a surface structure silmilar to that of paper, silicones are cast in sheet form, with the insert in a mold lined with paper which is prepared with a release agent. Upon being poured into the mold, the silicon adapts to the whole surface of the paper. After the silicone substance has set, an exact image of the paper structure is obtained on the surface of the silicon mat, so that after the lamination, almost no difference can be seen between the matt paper surface and the film surface.

It will be appreciated that the invention enables a laminated multilayer identification card having at least one surface with raised or relief areas to be produced as a result of compressing the superposed layers of the card under heat between plane parallel relatively hard plates. One of the surfaces of the card may itself be provided with relief print, before the lamination process involving relief 7. In the method of the invention an elastic layer is inserted between at least one of the relatively hard plates and the surface having the raised or relief-like areas.

WHAT WE CLAIM IS:-

1. A method for use in laminating a multilayer identification card having a relief surface, the superposed layers of the card being compressed under heat between relatively hard plates, in which an elastic layer is inserted between the relief surface of the card and one of the hard plates during the laminating process, the elastic layer being made of a material which does not combine with the outer layer of the identification card during the lamination process.

2. A method as claimed in claim 1 in which a second elastic layer is placed between the other surface of the card and the other of the hard plates during the lamination process.

3. A method as claimed in either claim 1 or claim 2 in which at least one of the elastic layers is made of silicon rubber.

4. A method as claimed in any one of the preceding claims in which at least one of the elastic layers is 0.5 to 2 mm thick.

5. A method as claimed in any one of the preceding claims in which at least one of the elastic layers has a hardness of 30 to 70 Shore.

6. A method as claimed in one or more of the preceding claims in which a particular surface structure is provided on the surface of an elastic layer which faces a surface of a card.

7. A method as claimed in claim 6 in which a surface structure comparable to that of a paper surface is provided on the surface of an elastic layer which faces a surface of a card.

8. A method as claimed in either claim 6 or claim 7 in which the particular surface structure facing the surface of a card is produced by pouring liquid silicon rubber on casting plates having the surface structure and prepared with a release agent.

9. A method as claimed in any one of claims 6 to 8, in which the particular structure of the surface facing an outer surface of the card is produced by pouring liquid silicon rubber on paper surfaces prepared with a release agent.

10. An identification card manufactured in accordance with any one of the preceding claims in which a paper strip provided with steel print is laminated with at least one of the surface layers of the card.

11. An identification card manufactured in accordance with any one of claims 1 to 9 in which a strip of film provided with steel print is laminated with at least one of the surface layers of the card.

12. An identification card as claimed in claim 10 in which the paper strip is a signature strip.

13. An identification card as claimed in any one of claims 10 to 12, in which prior to the laminating process, at least one of the surfaces of the card is provided with relief print.

14. A method of making an identification card substantially as described herein with reference to the accompanying drawings.

15. An identification card made by a method as claimed in claim 14.

JOHN ORCHARD & CO.
Chartered Patent Agents,
Staple Inn Buildings North,
High Holborn,
London WC1V 7PZ
Agents for the Applicants

Printed for Her Majesty's Stationery Office,
by Croydon Printing Company Limited, Croydon, Surrey, 1980.
Published by The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.

1576168 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

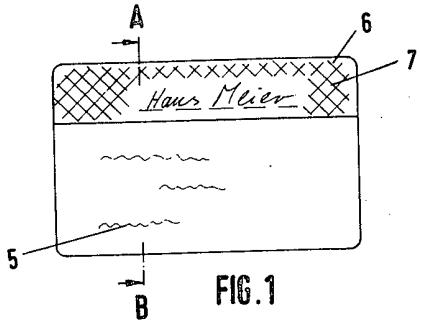

FIG.1

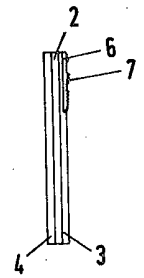

FIG.2

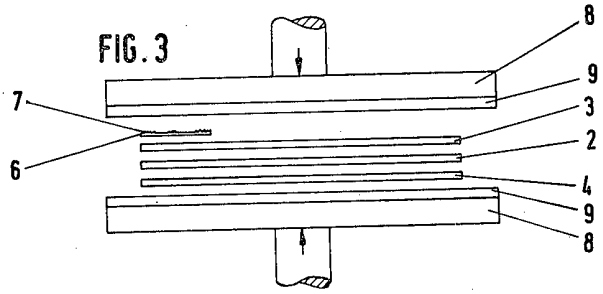

FIG.3

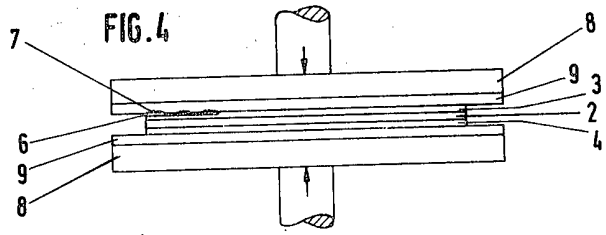

FIG.4