July 29, 1969 A. PETERS 3,457,661

IDENTIFICATION CARD AND METHOD OF MAKING IT

Filed June 16, 1967 3 Sheets-Sheet 1

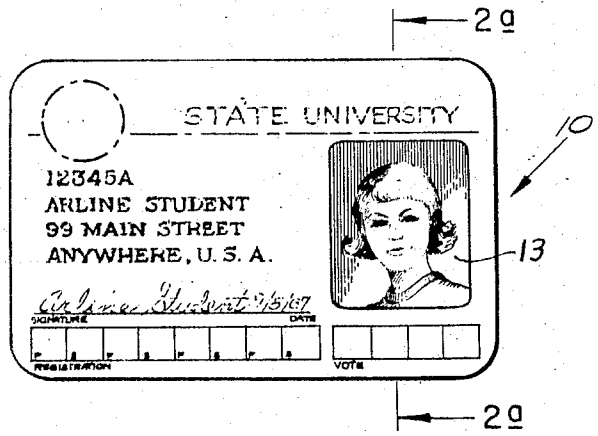


FIG. 1

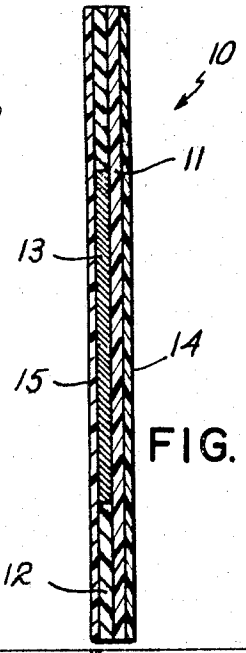


FIG. 2a

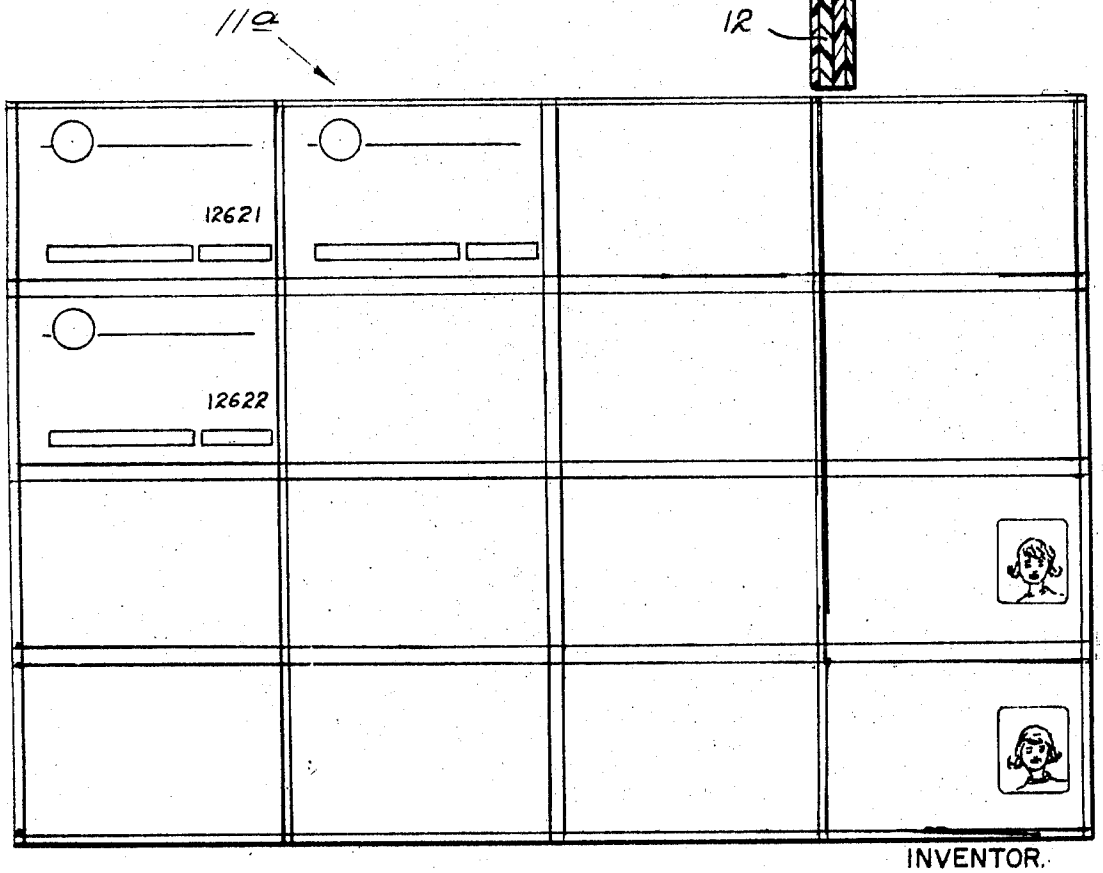


FIG. 3

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IDENTIFICATION CARD AND METHOD OF MAKING IT

Filed June 16, 1967 3 Sheets-Sheet 2

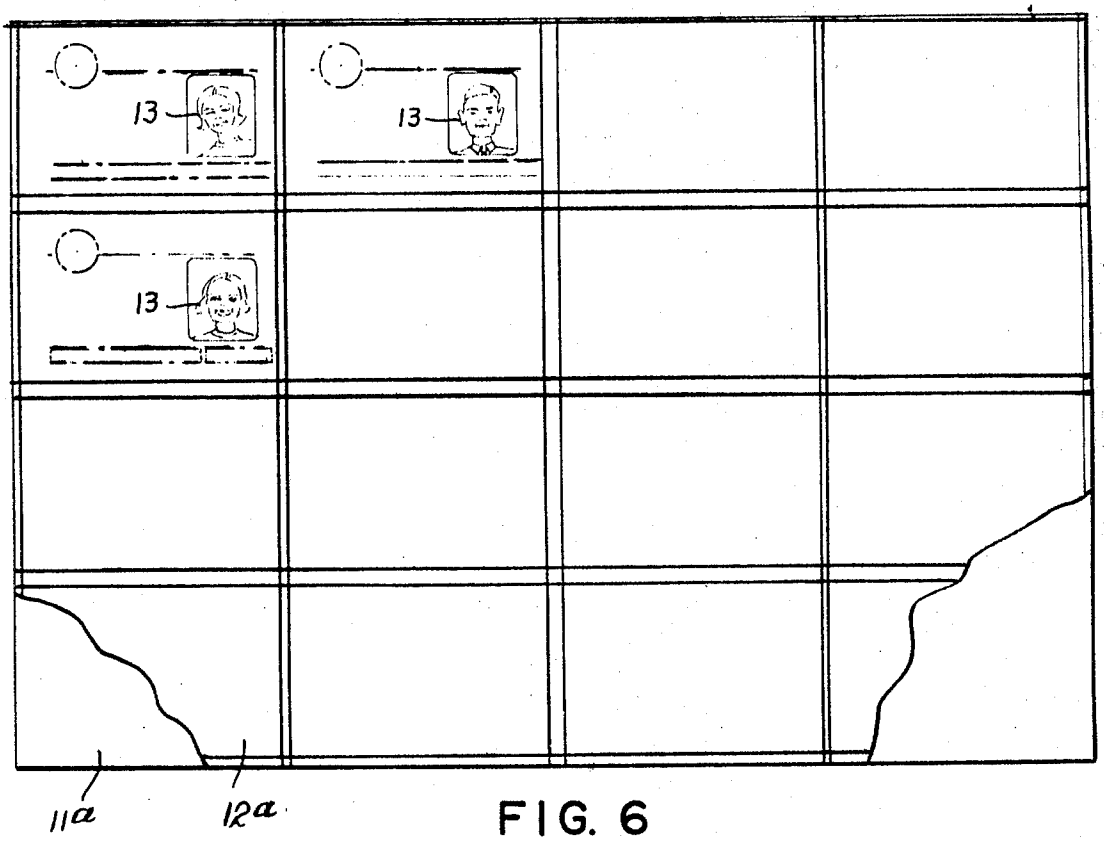


FIG. 6

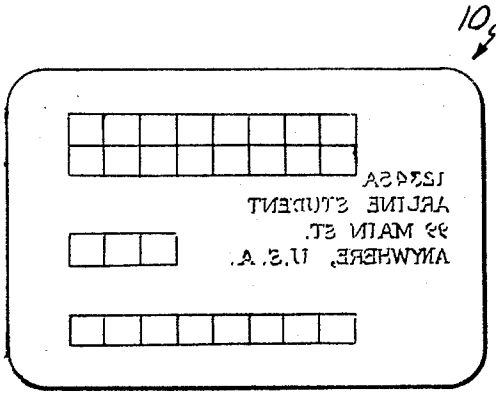


FIG. 2

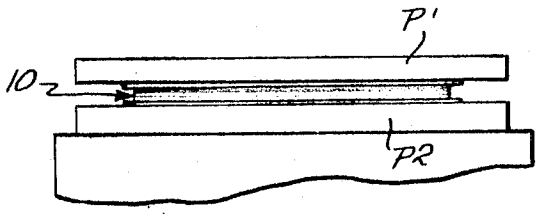


FIG. 7

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IDENTIFICATION CARD AND METHOD OF MAKING IT

Filed June 16, 1967 3 Sheets-Sheet 3

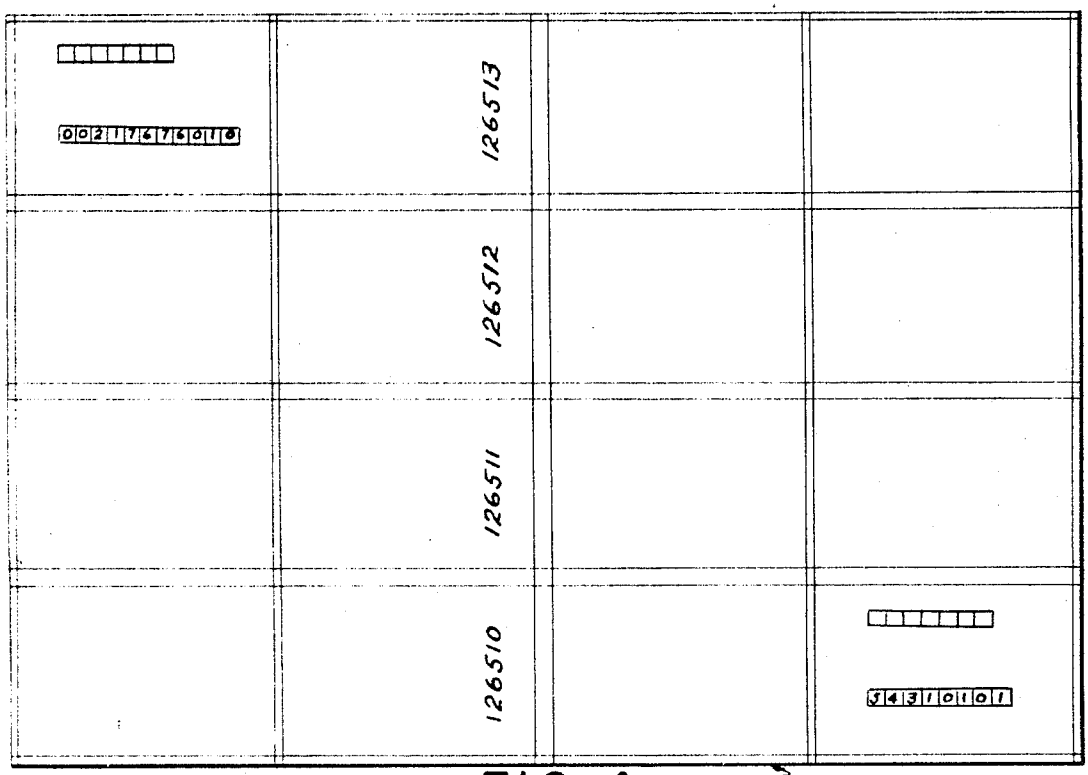


FIG. 4

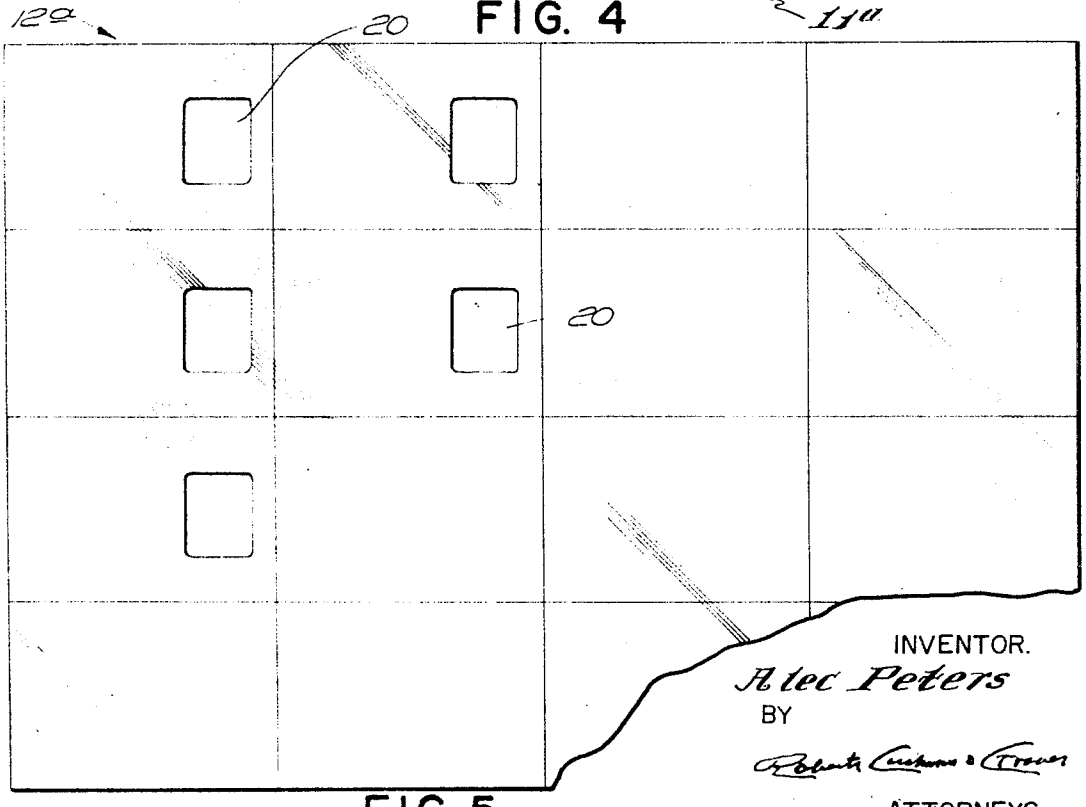


FIG. 5

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3,457,661

IDENTIFICATION CARD AND METHOD OF MAKING IT

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Int. Cl. G09f 3/02
U.S. Cl. 40—2.2 16 Claims

ABSTRACT OF THE DISCLOSURE

A hard, stiff, multi-ply card comprising a core ply of plastic material printed on both sides, a transparent ply of plastic material having window openings, each holding a photoprint, at one side of the core ply, and thin transparent protective plies of plastic material forming the exposed surface at opposite sides of the card, all of the parts being bonded firmly together by using heat and pressure.

Background of the invention

Identification cards, for example, so-called "credit cards" (which have come into widespread use in recent years) as well as cards of admission (for example to identify a workman in entering a manufacturing plant where secrecy is important), which must bear a photograph of the holder, are customarily so dimensioned as to fit into a pocket of a wallet or purse, or a pocket of the holder's clothing. Since such cards are often issued for extended periods, for instance a year, they may be handled many times, often with fingers which are not immaculate, and sometimes hastily jammed into a stuffed wallet compartment; occasionally the card may be exposed to rain, snow or oil as well as perspiration. Thus it is necessary that the card be resistant to mechanical injury as well as to chemical discoloration. Moreover, since the indicia which the card bears constitute the vital value of the card, such indicia must be of a nature or so protected as to remain legible throughout the life of the card.

Much effort has been expended in the attempt to produce an identification card having characteristics such as to withstand all of the above noted and other causes resulting in premature reduction in legibility, including the substitution of plastic for the more common cardboard and the embossing of the vital letters or numerals, but for most purposes, such prior proposals have failed to give entire satisfaction or involve undue expense.

The use of cards of this type in colleges or similar institutions for the identification of individual students has recently been widely adopted, one of the requirements being that the card incorporate a photograph of the student and also that it afford ample space for the application, by the individual college, of indicia clearly showing, for example, the courses of study which the student is entitled to follow; the schedule of classes; and extra-curricular activities and privileges.

Because of limitation in permissive size the cards thus provided must carry a substantial amount of printed material on both sides and, most essentially, the cost of such cards shall not be excessive, it being remembered that many colleges number the student body by thousands.

Summary

In the attainment of the object of the invention, that is to say the provision of a card particularly intended for and acceptable as an identification for college students, the present invention provides a multi-ply card of plastic material comprising one relatively thick ply of opaque sheet plastic of a character such as or so treated that it is capable of taking and retaining printing ink; a second

layer of approximately the same thickness as the first but of transparent material having a window opening therein with a photograph of the student within the window opening (said plies being in face-to-face contact) and a relatively thin transparent plastic ply covering the exposed face of each, respectively, of the aforesaid plies, all of the several plies being integrally bonded to each other by heat and pressure, after the opaque ply has received, on its opposite faces, such printed matter as may be desired and the photoprint has been installed. The printed matter at opposite faces of the card desirably includes a checkerboard of squares and perhaps a row or rows of such squares, with identification numbers and which are intended to receive symbols or characters applied by a stamping operation to the exterior surface of the card by the individual college. In the course of preparation, the thick core ply may receive a printed number to assist in the application, to said core member, of a photoprint bearing the same number and a picture of an individual student, this "negative" number being assigned to the individual student by the photographer when taking the picture, and initially appearing on the front of the print.

In the accompanying drawings:

FIG. 1 is a face view of a card such as results from the practice of the present method;

FIG. 2 is a rear view of the same card;

FIG. 2*a* is a section, to larger scale, substantially on the line 2*a*—2*a* of FIG. 1;

FIG. 3 is a plan view showing the front side of a sheet of opaque plastic material which has been laid out by printing to form rectangular areas, each of a size approximating that of the card to be made and having printed in certain rectangles, by way of example, some of the material which is to be exposed at the front side of the card, as well as an identifying numeral, and in certain rectangles showing a photoprint as having been affixed and concealing the numeral;

FIG. 4 is a view similar to FIG. 3, but showing the rear side of the same opaque sheet laid out by printing, in the same way as FIG. 3, and showing, in some, at least, of said rectangles, areas of printed material which are to appear at the rear side of the card, and likewise, in some of said rectangles, a grid-work of squares serially numbered to assist in the proper location of information indicia;

FIG. 5 is a fragmentary plan view of a sheet of transparent material, of the same size as the opaque sheet, also laid out in rectangles, by the use of a pre-ruled die, and punches, and provided with a die-cut aperture, within the bounds of each respective rectangle, designed to receive a photoprint;

FIG. 6 is a plan view showing the apertured transparent sheet, partly broken away, as assembled with and registering with the opaque sheet and showing, by way of example, a photoprint in each of certain apertures of the apertured transparent sheet; and

FIG. 7 is a fragmentary diagrammatic elevation, illustrative of the step of integrating the constituent plies.

Referring to the drawings, the numeral **10** designates a card made in accordance with the process of the present invention. The card, shown in FIG. 1 by way of example, is 3½ x 2¼ inches, the size most commonly used, and has corner radii of 0.125 inch. Obviously cards of other sizes and thicknesses may be made by the same procedure.

The card shown is of four-ply construction, as shown in FIG. 2*a*, comprising an opaque layer **11**, approximately 10 mils in thickness; a transparent, apertured ply **12** of the same thickness, with a photoprint **13** of approximately 10 mils in thickness disposed within the aperture of the ply **12**; and protective outer plies **14** and **15**, each, for example, 5 mils in thickness. The several plies are all of a

plastic material, usually a copolymer, for specific example, polyvinyl-chloride acetate such as may be purchased, for instance, from the Union Carbide Company, 270 Park Ave., New York, N.Y.

Experience has shown that a card convenient for handling and having the desired stiffness when of a thickness of 30 mils (or 0.030 inch) gives good results. To this end, sheet material in two thicknesses is obtained, the thicker material being 10 mils in thickness and the thinner material being 5 mils in thickness. One half of the thicker material is opaque, while the remainder of the thicker material and all of the thinner material is transparent. The opaque material is of a kind (commercially available) which will accept printer's ink, in this latter respect differing from many plastics. This opaque material may be white or colored, either of which is commercially obtainable. Since the commercial sheeting is not accurately square cut, it is desirable to purchase sheets which are somewhat oversize and then have them squared up by the printer as a step in the printing operation. For example, by ordering sheets 22½ x 49½, it is possible to cut from one of those sheets three perfectly rectangular 16 x 22 inch sheets.

In printing, a commercial vinyl-base ink is employed which is heat-resistant and makes a permanent bond with the opaque plastic sheet, but such ink is slow in drying and as the opaque sheet is printed on both sides, it is undesirable to attempt to print both sides on the same day, preferably printing the opposite sides 24 hours apart. In this way high quality printing may be obtained and the printing press is not required to remain idle for long periods while the first printing dries. In printing it is convenient to print thirty-two repeats of the card pattern at each impression.

The printed material for school use, such as above described, will usually include such things as the name of the school; the school seal; and as illustrated in FIG. 1 a horizontal row of squares visible at the front face of the card which may be numbered and which are designed to receive symbols or indicia applied by printing or hot stamping to the outer surface of the finished card. The back of the card may, for example, carry printed regulations as to the use and purpose of the card, and also a grid-work of squares, such as those shown on the face of the card, designed as a guide in the application, by hot stamping, to the finished face of the card, of indicia of any sort relating to student activities.

Just prior to fabricating the card by assembling its constituent plies, the rectangular areas which are to form the front faces of individual cards are provided with numbers, in series, these being the numbers assigned to the individual students, as above described, in making the photographs, the numbers being disposed at that part of the rectangular area which is to receive the photographic print.

The sheet **12***a* (FIG. 5) of transparent material is of the same thickness as the photoprint, so that the inclusion of the print will not result in a high area in the surface of the card, and is cut to the same dimensions as the sheet **11***a* and laid out and trimmed by a pre-ruled die to form rectangles, in number and size, and located like those of the sheet **11***a*. This sheet **12***a* is then subjected to a die-cutting operation whereby there is formed, in each rectangle, a window opening **20** of rectangular shape and of a size to receive a photoprint of the dimensions selected by the college. These windows are so arranged that the identifying numerals shown in FIG. 3 will be visible through the windows when the sheet **12***a* is assembled with the opaque sheet **11***a* so as to overlie the front face of the latter. The series of "negative" or identifying numbers may be applied to the face of the opaque sheet **11***a* as, for example, by means of a numbering head mounted in a commercial addressing machine of known type which also has a single-column lister mounted on it. The lister shifts the opaque core material from one card-area to the next automatically and the numbering head puts the negative or identifying number on the sheet. The negative number is put on the front of the sheet to assist the operator in putting the correspondingly numbered photoprint, in sequence, within the right window spaces but is concealed from the front by the photoprint after the latter has been affixed. The same negative number may also be applied to the rear face of the sheet **11***a* where it is always visible and is useful in initially distributing the cards to the respective students, and also to identify the owner, if it should be lost.

In assembling the several elements comprised in the card and assuming that two pieces **14** and **15** have been cut (FIG. 2*a*) from the thin, that is to say 5 mils transparent plastic of substantially the same size as the pieces **11***a* and **12***a*, and that the opaque plastic ply has been printed on both sides and numbered as above described, the sheet **14** of the 5 mils thick transparent plastic is laid upon a sheet or card of chip board which may, for example, be of a thickness approximating that of the completed identification card, and on top of this sheet, and with its edges registering with those of the 5 mils sheet **14**, the opaque printed sheet **11***a* is laid with its front side up. On top of this sheet **11***a* there is placed the transparent sheet **12***a* with its window openings **20** so located, as above described, that one of the numbers on the face of the sheet **11***a* is visible at each respective window opening. It is assumed that the photoprints have previously been made and that each has been numbered on its face with the negative number assigned to the student whose face appears on the photo. Each photoprint is trimmed, for example, by a hand-operated die-cutter so as to remove the negative number and so as to fit exactly within a window opening **20** of the sheet **12***a*, preferably interposing, between the photo and the opaque sheet itself, a double-coated contact tape of commercial type (not shown) thereby to adhere the photoprint firmly and smoothly to the exposed area of the opaque sheet. Desirably, the photoprint has been previously coated on its face with an adhesive, for example, a thermosetting adhesive. After photos have been placed in all of the windows in the sheet **12***a*, the second sheet **15** of transparent material 5 mils thick is laid on the apertured sheet in proper registry with the latter. The assembled multi-ply plastic material is placed between two finely finished chrome plated sheets of steel which are a little larger in area than the assembled plastic material. The assembly, including the steel sheets, is now placed in a conventional laminating press. Desirably, a piece of chip board is interposed between each steel plate and the corresponding press plate P1 or P2 to compensate for unevenness in the latter. To increase production, this press is so designed that it may take a plurality of the assemblies at the same time, for example four.

The laminating press preferably has a plurality of "bins," for example four, so that it is capable of performing a pressing operation on four of the above-described multi-ply assemblies or stacks during each cycle of the press. Further, to increase production, several of the assemblies, as above described, may be placed in each bin.

Each laminating cycle takes about eleven minutes (based on one assembly per bin) and is as follows: First, by the operation of a switch, pressure is caused to build up to between 200 and 300 p.s.i. and is maintained at that level for an entire 11-minute cycle. During the first minute and one-half steam is forced into the press plates and the discharge trap opened so that any water left from a previous cycle is forced out. During the next six and one-half minutes the trap is closed and steam applied such as to bring the temperature up to between 225 and 250° F. and is maintained at that level during the next three minutes. Steam is then shut off and cold water turned onto the plates to bring them down to approximately 125° F.

The result of this operation is that the four plastic plies are integrally bonded together so firmly that it is impossible for moisture or fluid of any kind to enter between them. The photograph is adhesively bonded both to the opaque core member and the front covering or protecting ply and is plainly visible through the latter while the printing, applied to the opaque or core sheet, is also plainly visible through the outer or cover plies at front and back. After the sheets have thus been assembled and permanently bonded together, each multi-ply assembly or stack bearing the imprint for thirty-two cards is cut into quarters, each piece thus formed constituting eight cards, and these eight card units are then divided to form individual cards, for example of the above-mentioned size of 2 21/64 inches x 3½ inches, by a die press capable of exerting a 20 ton pressure, the die being of such shape as to form the rounded corners desired in the complete card. As above noted, the process herein specifically described is equally applicable to the manufacture of cards of other sizes. After the card has been completed it may be embossed by means of a suitable embossing press to show, for example, the student's name, number and address or any other desired information and supplied with other desired information by a hot marking die. A card so produced has in a substantial degree all of the characteristics most desired in cards of this general type and in particular those making it especially qualified to meet the wishes of educational institutions.

While one desirable embodiment of the invention has herein been illustrated and described it is to be understood that the invention is broadly inclusive of the use of equivalent materials, process steps and the use of equivalent mechanism in the practice of said method.

I claim:

1. An identification card comprising four plies of plastic material and a photoprint, each of said plies being of the same peripheral shape and dimensions, one of said plies being transparent and of a thickness approximating that of the photoprint and having a window aperture therethrough within which the photoprint is housed; another of said plies being opaque and of approximately the same thickness as the apertured ply, said opaque ply being so assembled with the apertured ply as to contact the rear face of the photoprint; the other two plastic plies being transparent and of a thickness substantially less than that of the apertured ply and disposed, one in contact with the rear face of the opaque ply and the other in contact with the front face of the apertured ply, the several plies being so integrated, as by the application of heat and pressure, that the entry of moisture between the various plies is substantially impossible.

2. An identification card comprising four plies of sheet plastic material, one of said plies being opaque and bearing printed characters on its front and rear faces, respectively, a transparent ply, of the same size as the opaque ply and of a thickness approximately that of the opaque ply, adherent to the front face of the latter, said transparent ply having therein an aperture, a photoprint within said aperture, and two transparent protective plies, one contacting the exposed face of each of the aforesaid plies, the several plies being so integrated as by the application of heat and pressure as to inhibit the entry of moisture between them.

3. An identification card according to claim 1, wherein the opaque ply bears printed characters on its front and rear faces respectively.

4. An identification card according to claim 2, wherein the opaque ply is of a plastic material which will accept printer's ink and the printed characters are formed of a vinyl-base ink.

5. An identification card according to claim 1, wherein the total thickness of the card is of the order of 0.030 inch.

6. An identification card according to claim 1, further characterized in that the plastic plies are of polyvinylchloride acetate.

7. That method of making a multi-ply identification card having embedded therein a photoprint, said method comprising as steps: providing transparent thermoplastic sheet material of a thickness approximately that of the photoprint, forming in said sheet an aperture of a size and shape to receive the photoprint, providing opaque thermoplastic sheet material capable of receiving printing ink, providing both sides of the opaque material with desired printed indicia including serially numbered areas at one side at least, assembling said sheets to contact each other, placing the photoprint in the aperture in the transparent sheet and adhesively bonding it to the opaque sheet, arranging a sheet of transparent thermoplastic material to contact the exposed surface of each, respectively of the aforesaid sheets, fusing the several sheets by heat and pressure, and trimming the assembly to the shape and size of the desired card.

8. That method of making an identification card having embedded therein a photoprint which comprises as steps: providing transparent thermoplastic sheet material of a thickness closely approximating that of the photoprint, providing opaque thermoplastic sheet material of a thickness approximating that of the photoprint, providing said transparent sheet material with an aperture such as to receive the photoprint, marking the opaque sheet material with an outline showing the approximate shape and dimensions of the desired card, within said outline arranging the photoprint with its face exposed; adhering the print to the opaque sheet material, providing the thicker transparent material with a similar outline, within said latter outline forming an aperture of a size such as to receive the photoprint, assembling the apertured sheet with the opaque sheet so that the photoprint is within the aperture of the transparent sheet, providing sheets of a thinner transparent thermoplastic material, assembling sheets of the thinner transparent material with the assembled apertured and opaque sheet so that one of the thinner sheets contacts the exposed face of the opaque sheet and the apertured sheet respectively, and by heat and pressure integrating the several sheets so as to inhibit the entry of fluid material between adjacent sheets.

9. The method according to claim 8, further characterized in that before assembling the apertured sheet with the opaque sheet characters are printed on both sides of the opaque sheet.

10. The method according to claim 9, further characterized in that in printing the opaque sheet the same identifying numeral is printed on its opposite sides, the numeral which is printed on its front side being arranged within the outline printed thereon and at the location at which the photoprint is to be assembled with the opaque sheet, and, that preparatory to assembling the photoprint with the opaque sheet, the photoprint has been provided with an identifying numeral like that which is printed on the face of the opaque sheet.

11. The method according to claim 8, wherein after the several plies are assembled the assembly is placed as a unit between the platens of a hot press and subjected to a pressure of between 200 and 300 p.s.i. for a period of approximately 11 minutes.

12. The method according to claim 8, wherein as a preliminary step, sheet material is provided in a commercial size of 22½ x 49½ inches; each such sheet is cut to form three perfectly rectangular sheets of 16 x 22 inches each, and in printing the opaque sheet, a single impression comprises the printed material which is to appear on the front and back of 32 identification cards, and after assembly of the several sheets and their integration by heat and pressure the individual cards are separated by a suitable die which provides the individual cards with rounded corners.

13. The method according to claim 8, further characterized in that the sheet material is a polyvinyl-chloride-acetate and that the thicker material is approximately 10 mils thick while the thinner material is approximately 5 mils thick.

14. The method according to claim 8, further characterized in that in assembling the photoprints with the opaque ply a double-coated contact adhesive is employed.

15. That method of making a multi-ply identification card having embedded therein a photoprint, said method comprising as steps: providing sheet thermoplastic material including transparent material in two thicknesses, and opaque sheet material of substantially the same thickness as the thicker transparent material, the opaque material being of a thickness approximating that of the photoprint and being of a character such that it will receive and retain characters imprinted by the use of a vinyl-base ink, cutting from the thinner transparent material two sheets, each of a size such that at least one ply of the desired card may be made therefrom, cutting from each of the thicker materials a sheet of a size such that at least one ply of the intended card may be made therefrom, providing the sheet of the thicker transparent material with at least one window aperture of a size to receive the photoprint, imprinting the opposite sides of the opaque sheet with characters or symbols which are to be observable at the front and back of the card, respectively, so assembling and registering the sheet having the aperture therein as to contact the front face of the opaque sheet, placing the photoprint in the aperture in the apertured sheet and securing it therein, so assembling the thinner transparent sheets with the two assembled

thicker sheets that one of the transparent sheets is in contact with the exposed surface of one, respectively, of the thicker sheets, placing the assembly between the platens of a hot press, and subjecting the assembly to heat and pressure such as integrally and permanently to bond the several plies together.

16. The method according to claim 8, further characterized in that the photoprint, as initially provided, bears an identifying number on the same side with a picture of the person for whom the card is intended, applying the same number to both faces of the opaque sheet material; prior to assembling the photoprint with the opaque sheet, removing that part of the photoprint upon which said number appears; so adhering the remainder of the print to the front face of the opaque sheet as to cover and conceal the number on the front face of the latter; and thereafter completing the assembly and integration of the several sheets.

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283—7