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ADHESIVE COMPOSITION FOR PREPARATION OF A LAMINATED PHOTOGRAPHIC IDENTIFICATION CARD COMPRISING GELATIN, A COPOLYMER LATEX OF POLYVINYL ACETATE AND AN ALKYL ESTER OF AN UNSATURATED CARBOXYLIC ACID, A PLASTICIZER AND A SOLVENT

Original Filed Aug. 7, 1967

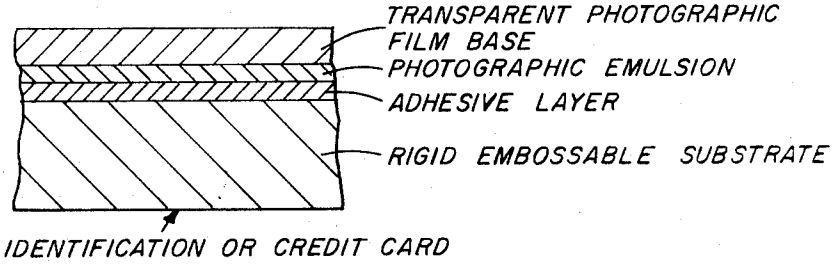


FIG. 1

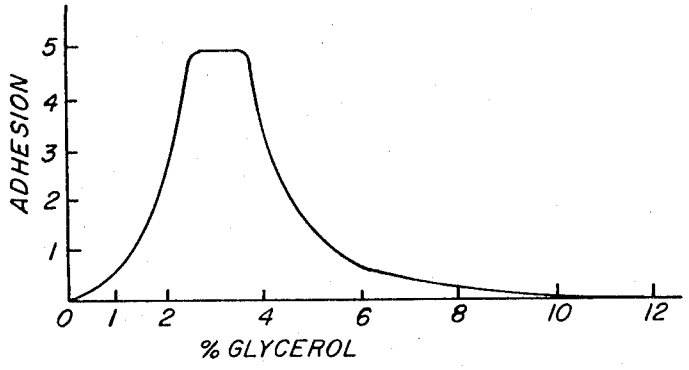


FIG. 2

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Original application Aug. 7, 1967, Ser. No. 658,705, now Patent No. 3,520,758. Divided and this application Dec. 10, 1969, Ser. No. 883,850

Int. Cl. C09 *11/00*

U.S. Cl. 260—8 1 Claim

ABSTRACT OF THE DISCLOSURE

An embossable identification or credit card has been made by laminating the photographic emulsion layer of a transparent photographic film to a rigid substrate using an adhesive based on a latex of polyvinyl acetate copolymerized with an alkyl ester of an unsaturated carboxylic acid to which gelatin, gelatin plasticizer and an attack solvent for the substrate are added. The migration of the plasticizer from the adhesive into the emulsion during and subsequent to lamination causes an increased hardening and/or plasticizing of the emulsion and improves cohesive bonding within the emulsion, and consequently the overall toughness, durability and quality of the identification card produced. Alternatively, the gelatin plasticizer may be wiped onto the surface of the photographic emulsion layer just prior to the lamination.

This application is a division of application Ser. No. 658,705 filed Aug. 7, 1967 and issued July 14, 1970, as U.S. Pat. No. 3,520,758.

The present invention relates to a novel adhesive composition for use in the preparation of an improved photographic identification or credit card.

The well-known "credit" or "identification" cards carried by many people for one purpose or another are well known to all. Such identification or credit cards usually comprise a flat member, at least part of which is formed from an embossable material such as a metal and more currently a plastic, this embossable material having text embossed thereon from which a printed impression may be made upon the business document that is required in making a charge entry or the like. Some such identification cards although embossable are not embossed and include merely the photographic image of the carrier along with other relevant data related thereto.

The physical requirements for these cards necessitated by their frequent handling and exposure to sunlight or conditions of extreme heat, cold and humidity in a variety of industrial applications preferably include high wear resistance, toughness, ability to be embossed (as mentioned above, freedom from curl, resistance to heat, cold and ultraviolet light and others. The cards preferably should be unaffected by water immersion and must be of a chemical composition that does not have adverse effect in either black and white or color (processed) photographic emulsions.

The process of making such cards in order to be practicable and economical should be simple, convenient, rapid, chemically innocuous and, if heat activation is required, the temperature of the laminants should not exceed about 220° F. to avoid adversely affecting the dye image. Furthermore, the adhesive used in laminating should not change the color and definition of the photographic image.

A two-part laminate, which has been disclosed in the prior art (Johnson, U.S. Pat. 3,152,901), is the simplest and most conveniently produced type of card presently known insofar as manufacture is concerned; however, the simplicity of such a structure, places higher strength requirements on the photographic emulsion—to rigid, embossable substrate bond than in the case, for example, where cars are formed with a photographic film having a rigid embossable-substrate layer on both sides thereof, i.e., a 3-ply lamination, and with the photographic film ply slightly undercut so that a very strong substrate-to-substrate lamination can be made about the periphery of the card. However, these cards are more expensive and generally require more manual labor during lamination and hence, the two-ply card is preferred.

The best of the two-play cards currently produced are perhaps those structurally similar to the card disclosed in the above-identified Johnson patent. This patent describes a method for making an identification card by laminating an embossable, rigid poly(vinyl chloride) substate to an emulsion bearing transparent photographic film, emulsion side down to the substrate using and adhesive composition of Eastman 910 cement (a cyano acrylate) in the lamination. Such cards have proven useful; however, it has been determined that the adhesive tends to degrade upon exposure to sunlight due to the action of ultraviolet rays and, hence, that the laminate plys separate after such exposure.

It is therefore the object of the present invention to provide an improved tamper-proof identification card having the above-described physical characteristics while avoiding the short-comings of the best prior art devices, and also a method of producing such a device.

Other objects and advantages of the present invention will be made obvious to those skilled in the art by the following description when considered in relation to the accompanying drawing of which:

FIG. 1 is a cross-sectional view of the preferred identification device of the present invention assembled in accordance with the method of the present invention; and

FIG. 2 is a graph showing the relationship between adhesion and the amount of gelatin plasticizer, in this instance glycerol, which is present in the adhesive compositions of the present invention.

According to the persent invention, there is provided a tamper-proof identification device comprising a card preferably formed from an embossible material, a photographic film base or support coated upon at least one side thereof with a photographic emulsion layer bearing identifying indicia therein, said emulsion layer being laminated to said card and an adhesive layer joining said card to said photographic emulsion layer, said adhesive consisting essentially of from about 75 to about 95 percent by weight of polyvinyl acetate copolymerized with an alkyl ester of an unsaturated carboxylic acid, from about 5 to about 15 percent by weight of gelatin, and from about 0.25 to about 6 percent by weight of a gelatin plasticizer. The photographic emulsion layer contains from about 0.25 to about 4 percent by weight of a gelatin plasticizer which has migrated from either the surface of the photographic emulsion or from within the adhesive composition utilized to join the members during lamination.

There is also provided a novel process for manufacturing a tamper-proof identification device as above-described which involves introducing a gelatin plasticizer into the photographic emulsion layer during the lamination process thereby impoving cohesive bonding within the photographic emulsion layer, and consequently the overall toughness and durability and "tamper-proofness" of the finished composite device. This process is suitable for laminating photographic emulsion layers to an almost endless list of substrates.

Finally, the invention provides an aqueous dispersed adhesive composition, suitable for joining a gelatin emulsion to a substrate, consisting essentially of from about 60 to about 90 percent by weight of a latex of polyvinyl acetate copolymerized with an alkyl ester of an unsaturated carboxylic acid, from about 5 to about 15 percent by weight of a gelatin, from about 0.5 to about 10 percent by weight of a gelatin plasticizer and from about 5 to about 20 percent by weight of an attack solvent for said substrate.

As shown in FIG. 1, the finished identification device or credit card of the present invention consists of a rigid and preferably embossable substrate laminated to a transparent photographic film base coated, according to the preferred embodiment of FIG. 1, upon one side thereof with a photographic emulsion, which emulsion bears identifying indicia therein. The two plies of the laminate are joined by an adhesive layer which holds the emulsion-coated surface of the transparent photographic film base in close proximity to the upper surface of the substrate.

The substrate member of the laminate may consist of any material which will form a pratical support for the balance of the card, i.e. the card should be sufficiently rigid to serve the practical usages to which such cards are put while being sufficiently flexible so as not to be brittle. Since it is generally preferred to have printed indicia embossed into the card surface, the substrate should be of a material which is ductile and embossable as well as easily and economically fabricated. At present cards of unplasticized polyvinyl chloride of standard identification card grade materials containing such modifiers as proprietary stabilizers and ranging in thickness from about 10 to about 30 mils have been found most suitable for use in embossed identification and credit card applications. Should embossing and relative thinness not be of importance in any particular application, the card may be made as thick or as flexible as desired to suit the particular usage.

When, as in the preferred embodiment described in greater detail below, the photographic emulsion layer bears "reverse printed" identifying indicia therein, the substrate material should include a pigment such as titanium dioxide (TiO_2) which imparts light (in this case white) color to the substrate so that its surface will reflect light impinging thereon back up through the photographic emulsion layer and transparent photographic film base to reveal the indicia photographically recorded therein and thereon. The substrate may however be transparent and have an opaque film base as support for a conventionally printed photographic emulsion.

The film base member of the card may consist of any number of materials presently in use as film base. These include cellulose esters such as cellulose acetates, (especially cellulose triacetate) cellulose acetate-butyrates and cellulose acetate propionates, cellulose tripropionate, cellulose tributyrate and polyesters such as poly(ethylene terephthalate) which is particularly preferred where a transparent photographic film base is used in the present invention. Paper or other opaque materials may be used in combination with the transparent substrate described above. Furthermore, simple translucent substrates may be used in certain reverse printing applications.

The thickness of the film base is not of particular importance so long as it is thin enough to be adequately ductile to emboss when embossing of the card or device is desired. According to the preferred embodiment, the thickness of the film base ranges from about 2.5 to about 4.0 mils, these dimensions being particularly advantageous when the film base consists of a polyester material, and the card is to be embossed.

The photographic emulsion which is coated upon the film base may consist of any conventional black and white or color emulsion presently in use. Such gelatin emulsions are well known in the art and common knowledge to people employed in these areas. For instance, the conventional gelatinosilver halide emulsions presently in general use are most suitable to application in the present invention. Three layer color emulsions are also preferred for use in the card of this invention.

Although the thickness of the emulsion layer may vary according to the particular emulsion used and whether the emulsion produces a color or black and white image, satisfactory results are obtained when the total emulsion thickness ranges from about 0.2 to about 0.8 mil.

At this point, it must be noted that one of the factors which distinguishes the present identification card from those of the prior art is the presence in the photographic emulsion layer of from about 0.25 to about 4.0 percent by weight of a gelatin plasticizer which improves the cohesive bonding within the emulsion and consequently the overall durability of the identification or credit card of this invention. The particular plasticizers which may be utilized for this purpose and the method of introducing them into the photographic emulsion layer will be described in detail below, it being important now only to note their presence in the emulsion layer for the above-described purpose.

The adhesive layer which forms the joint between the photographic emulsion and the substrate is comprised of a material consisting essentially of from about 75 to about 95 percent by weight of a copolymer of poly(vinyl acetate) and an alkyl ester of an unsaturated carboxylic acid, from about 5 to about 15 percent by weight of gelatin, and from about 0.25 to about 6 percent by weight of gelatin plasticizer.

The poly(vinyl acetate) copolymer which forms the foundation of the adhesive composition, whose contents are described in detail below, may be a 55% solid latex available from Union Carbide Co. as Gelva TS–100 or Gelva TS–70. These compounds are poly(vinyl acetate)-alkyl acrylate and poly(vinyl acetate)-alkyl maleate copolymers respectively.

The gelatin portion of the adhesive layer preferably consists of a photographic emulsion grade gelatin, and the better the grade of the gelatin, the fine the form of the gel and consequently the better the bond formed between the substrate and the photographic emulsion. Thus, a low color gelatin will produce superior results, although a glue grade gelatin could be used if the card is intended only for short term use, since such low grade gelatin may cause a loss or change of color or definition in the photographic emulsion, particularly where the identifying indicia are present as color images.

The gelatin plasticizer which is present in the adhesive layer may consist of any conventional plasticizer, and its presence and composition will be explained in greater detail below in the discussion of the method of forming the card or device of FIG. 1.

The thickness of this adhesive layer according to the preferred embodiment ranges from about 0.5 to about 2.0 mils. Such a thickness provides excellent adhesion and an optimum of embossability.

Thus, it should be clear from the above discussion, that the preferred embodiment of the identification device of the present invention as shown in cross-section in FIG. 1, is one having a polyvinyl chloride substrate ranging in thickness from about 10 to about 30 mils, having a transparent polyester film base ranging in thickness from about 2.5 to 4.0 mils coated upon at least one side with a processed photographic emulsion bearing "reversed printed" identifying indicia therein and having a thickness of from about 0.2 to about 0.8 mil. laminated emulsion side down thereon, the substrate and photographic emulsion being joined by an adhesive layer ranging from about 0.5 to about 2 mils in thickness and having the above-described composition.

The identification device or credit card having the above-described composition is tough and durable, resistant to moisture and the degrading effects of ultraviolet light which affected prior art identification cards, ex-

tremely tamper-proof in that the layers cannot be separated without destroying the indicia bearing photographic emulsion layer and can be simply, economically and rapidly assembled by means of the process of the present invention as set forth below.

In its process aspect, the invention comprises the improvement of conventional methods of fabricating two-ply identification cards to produce the above-described improved identification device.

In a process for laminating a photographic emulsion layer bearing identifying indicia therein, to a substrate, the present invention provides the improvement which comprises introducing a gelatin plasticizer into the photographic emulsion layer during the lamination process thereby improving cohesive bonding within the photographic emulsion layer and consequently the overall toughness, durability and moisture and ultraviolet resistance of the finished laminate.

According to the preferred embodiment of the present invention, a card or substrate of the type described above in connection with the structure of the finished device is laminated to a photographic film base having a photographic emulsion layer bearing identifying indicia therein, which combination is also described above, utilizing a water or water and alcohol dispersion of an adhesive described in detail below.

As stated above, the substrate is preferably sufficiently ductile to be embossed and may consist of any material adequately suited to such an application.

The photographic film base and photographic emulsion layer which is coated thereon are also described in detail above. The identifying indicia which are present in the photographic emulsion layer, are preferably produced by "reverse printing" the photographic image of the indicia into said emulsion. This "reverse printing" method is well known in the art and is described in great detail in U.S. Pat. 3,152,901 to Johnson. When the transparent photographic film is subsequently laminated to the above described light or white-colored substrate, the image is viewed by reflected light and is right reading.

The gelatin plasticizer may be introduced into the photographic emulsion layer in at least two alternative manners. Regardless of which manner is utilized, the plasticizer cannot be introduced before the emulsion is processed and the visible photographic image produced therein, as such plasticization prior to processing would render the emulsion much too soft to permit a subsequent processing.

Thus, the gelatin plasticizer may be introduced into the emulsion by mixing it directly into the aqueous dispersion of adhesive composition, which is the preferred method and that demonstrated in the example below, or alternatively, from about 1 to about 2 grams of plasticizer per square foot of photographic emulsion may be applied directly to the surface of the photographic emulsion by wiping from about 5 to about 15 percent solids solution of the plasticizer in an alcohol such as methanol onto the surface of the photographic emulsion, mixing of the plasticizer and the other adhesive components taking place during the actual lamination of the layer by the application of heat and pressure which also serves to evaporate the alcohol solvent.

Whichever method is used to introduce the plasticizer, the proportion thereof relative to the total weight of the adhesive should remain within the designated preferred ranges in order to achieve the desired preferred results. Optimum toughness and durability are attained with the proportion of plasticizer ranges from about 2 to about 5 percent by weight of an adhesive as explained below. It should be noted here, that the photographic film having a layer of gelatin plasticizer of the above-described composition and density wiped over the surface of its photographic emulsion layer may be valuable in and of itself as a pretreated photographic film which is ready for lamination to any number of rigid or soft substrates with an almost endless variety of adhesives to achieve a broad range of different results.

When the gelatin plasticizer is incorporated into the adhesive composition prior to lamination according to the methods described below, from about 25 to about 50 percent thereof will migrate from the adhesive layer into the emulsion layer during lamination.

When the plasticizer is coated by wiping or otherwise directly upon the emulsion surface, from about 25 to about 50 percent thereof migrates into the emulsion layer while the balance thereof migrates into the adhesive layer improving the cohesive bonding within the gelatin contained therein. In either case, this migration or distribution, although occurring largely during the actual lamination, proceeds to a lesser degree for at least a period of several weeks subsequent to the initial fabrication of the card, and hence the card will actually become tougher few weeks of its existence.
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In the case where the photographic emulsion layer consists of a three-layer color emulsion, it is believed that the gelatin plasticizer migrates only to a depth of one third the thickness of the total emulsion layer. In the case of a black and white, single layer emulsion, penetration of the plasticizer is believed to be again substantially one third the thickness of the emulsion layer; however, in this instance it is highly probable that migration of the plasticizer over a period of several weeks provides much deeper penetration thereof to ½ or even ¾ of the total emulsion thickness.

The actual lamination of the members of the identification device into an integral unit should be performed within certain broad ranges of time, temperature and pressure in order to achieve optimum results in the form of a vastly improved identification or credit card.

The adhesive mixture, in this instance including or excluding the gelatin plasticizer, can be precoated upon the substrate material and cured by drying at from about 25° C. to about 60° C. for from about 5 minutes to about 24 hours. The resulting layer is nontacky. Alternatively, the adhesive composition may be applied immediately prior to lamination and subjected to a rapid and partial drying within the above described ranges.

The cured-adhesive coated substrate described above, may find utility in a variety of applications other than that specifically described here. For example, a card could be made by laminating a conventionally printed photographic print to a transparent substrate member, and the precoated substrate could be a valuable and time-saving device for the laminator of the numbers of such a card.

The latex mixture can be applied by spray, brush, roller, or any of the conventional coating schemes used in good adhesive practice.

Laminating temperatures in the embodiments wherein poly(vinyl chloride) materials are used as subtrates are limited to a range of about 140 to 160° C. due to the low softening point of such materials. Thus, when poly(vinyl chloride) is used as substrate, as in the preferred embodiment, it is desirable to apply the adhesive to the substrate in a precoating procedure carried out by high volume production and curing the same in a similar manner to a dry, nontacky coating by heating to within the above-described curing range for the above-described periods.

The actual lamination is more temperature sensitive than pressure sensitive, and so long as adequate heat is applied the pressure need only be enough to press the various members of the laminate into contact with each other.

Suitable laminating pressures may range from about 50 to about 2000 p.s.i. depending upon the amount of heat applied to the laminants. Dwell time (i.e. the period for which the laminating pressure is applied to the opposing surfaces of the finished laminate) for this pressure may range from a fraction of a second (about $\frac{1}{100}$) to a maxi-

mum of about one minute (in the case of color emulsions) depending upon the amount of heat applied, and the character of the laminants.

Lamination can be accomplished at somewhat higher temperature than those used in the drying of the precoated adhesive without distortion of the poly(vinyl chloride) or other low temperature distorting material, if the heat is confined to the adhesive and photographic emulsion layers. This can be accomplished most conveniently by preheating the photographic emulsion with impinging hot air at about 225° F. before it is brought into contact with the adhesive-coated substrate in a lower temperature nip-roll lamination. Thus, with such a preheating, the dwell time for the pressure during lamination is only a fraction of a second and lamination at linear speeds of four feet per minute has been carried out.

A maximum pressure dwell time must be established for lamination utilizing color photographic emulsions, since when pressures and temperatures in the range discussed above are applied to the emulsion for longer than about one minute color buildup (i.e. staining of clear areas) occurs thus destroying the clarity and definition of the image which it is desired to preserve.

The adhesive composition which is utilized in the process of this invention provides a unique adhesive for joining photographic emulsions to a variety of substrates, and it is particularly effective for joining such materials to poly(vinyl chloride) substrates.

As stated above, the adhesive comprises a water dispersion of an adhesive composition consisting essentially of from about 60 to about 90 percent by weight of a latex of polyvinyl acetate copolymerized with an alkyl ester of an unsaturated carboxylic acid, from about 5 to about 15 percent by weight of a gelatin, from about 0.5 to about 10 percent by weight of a gelatin plasticizer and from about 5 to about 20 percent by weight of a substrate attack solvent.

The composition of the gelatin component of the adhesive has been described above.

The copolymers which are preferred for optimum results in the present invention are a poly(vinyl acetate)-alkyl acrylate copolymer commercially available as a 55 percent solids dispersion in water or water and alcohol known as Gelva TS–100 and a poly(vinyl acetate)-alkyl maleate copolymer commercially available as a 55 percent solids dispersion in water or water and alcohol known as Gelva TS–70. Both of these compositions are well known adhesives and their use as such is well known in the art. It should of course be clear that in the finished card described above, the latex is present as a copolymer film, the dispersing water or water and alcohol medium having been evaporated during curing of the adhesive prior to lamination.

The plasticizers which are suitable for use in the method and products of the instant invention include generally almost any polyhydric organic compound commonly used in such plasticization applications. In particular, formamide, urea, ethanol formamide, poly(ethylene glycol), methylpentane diol, dicarbitol succinate, and dimethoxy tetraethylene glycol are preferred. Glycerol is specifically preferred for optimum results when the photographic emulsions of the type used in this invention are joined to substrates such as the poly(vinyl chloride) base of the present invention. The quality of the glycerol or other plasticizer should be what is known in the art as "technical grade" to insure that no impurity which might harm the photographic image is introduced into the emulsion.

The attack solvents which are suitable for use in the adhesive composition include almost any solvent which tends to activate and soften the surface of the substrate, a large number of which are well known in the art. Specifically preferred as attack solvent in the preferred embodiment of the invention wherein poly(vinyl chloride) is used as substrate are methyl isobutyl ketone, methyl ethyl ketone, and cyclohexanone which attack such a substrate in exactly the degree required for the most satisfactory bonds. An adhesion improver such as poly(vinyl methyl ether) may be incorporated into an attack solvent such as methyl ethyl ketone to provide a further improved adhesion.

When the gelatin concentration in the adhesive is reduced to below the recommended 5 percent or increased to above the recommended 15 percent adhesion between the laminants becomes relatively poor and the product of inferior quality.

The concentration of the attack solvent must be maintained within the recommended boundaries so that the adhesive layer and consequently the laminated structures can be properly dried and so that sufficient attack is provided to produce superior results. Below the recommended 5 percent minimum concentration, attack on the substrate is insufficient to provide a good bond while above the recommended 20 percent maximum concentration, drying of the adhesive even in a precoating and curing step as described above is impractical and sometimes even impossible within any reasonable boundaries of time and temperature.

The limitations placed upon the amount of glycerol or other plasticizer which is either incorporated into the adhesive composition or coated thereon is demonstrated most effectively by the graph of FIG. 2. The vertical axis of the graph represents a subjective scale ranging from very poor to excellent and numbered 1 to 5 to measure the adhesion between the photographic film and substrate, with the concentration of glycerol in the adhesive prior to lamination recorded along the horizontal axis. As is clear from this graph, at concentrations of glycerol below about 0.5 percent adhesion is at best very poor and the same is true at concentrations of glycerol above or about 10 percent, a maximum and excellent adhesion being attained when the glycerol concentration ranges from about 2 to about 5 percent by weight.

The amount of latex in the adhesive composition is not critical. So long as it falls within the specified range, good adhesion will be attained providing the balance of the components are within their required ranges.

The water into which the adhesive composition is dispersed, should be distilled or Permutit-type water to insure that no undesirable impurities which might affect the quality of the photographic image are introduced into the adhesive system. The quantity of water utilized is controlled by the consistency which is desired for the adhesive compositions, and hence it is ultimately determined by the method which is used to apply the adhesive, i.e. spray, brush, roller, etc.

The following examples will serve to better illustrate the method, products and articles of this invention, and should not be construed in any way as limiting:

EXAMPLE 1

An adhesive mixture of:	G.
Poly(vinyl acetate)-alkyl acrylate copolymer latex (Gelva TS–100, 55% solids)	100
Photographic emulsion grade gelatin	10
Glycerol	10
Distilled water	110
Methyl iso-butyl ketone	15

is formulated as follows: the gelatin is dissolved in distilled water at 90° C. and the glycerol added to this mixture. The mixture is cooled to 30° C. and added to the latex wtih rapid stirring. Finally, the methyl iso-butyl ketone is added.

This mixture, when coated on a conventional polyvinyl chloride substrate and dried in air at 25° C. for 72 hours to produce a dry coat thickness of about 1 mil, yields good quality lamination to color photographic emulsions when laminated at 140–160° C. under 1000 p.s.i. for a period of about 30 seconds. The resultant bond is tamperproof and the cohesive strength of the photographic emulsion improved.

EXAMPLE 2

An adhesive mixture of the following composition is formulated as in Example 1:

	G.
Poly(vinyl acetate)-alkyl maleate copolymer latex (Gelva TS–70, 55% solids)	100
Photographic emulsion grade gelatin	3
Glycerol	3
Distilled water	100
Methyl ethyl ketone	10

This solution is applied to a 0.020 inch thick rigid polyvinyl chloride substrate with a fiber surfaced paint applicator and cured 20 minutes at 120° F. to yield a 1.0 mil dry thickness. Laminations made in the laboratory press under 1000 p.s.i. pressure and 190° F. temperature for 10 seconrs are strong, tamperproof and of good quality.

EXAMPLE 3

The adhesive layer can be made more aggressive by adding a proportion of poly(vinyl methyl ether) in the form of a solution in methyl ethyl ketone, for example:

	G.
Poly(vinyl acetate)-alkyl acrylate latex (Gelva TS–100)	100
Photographic emulsion grade gelatin	3.4
Glycerol	3.4
Distilled water	100
Polyvinyl methyl ether 15% in methyl ethyl ketone	20

A solution prepared and coated as before exhibits improved adhesive attack on the polyvinyl chloride substrate.

In some instances, it may be desirable to incorporate some of the identifying indicia upon the rigid substrate, as for example by printing, prior to application of the adhesive thereon and lamination of the composite card. This is easily done, and any amount of the indicia may be printed upon the substrate or produced in the photographic emulsion layer according to the desire of the manufacturer.

As mentioned earlier, the card may also be embossed providing thickness and material requirements are met as they are according to the preferred embodiments of the present invention.

It may also be desirable to include means on the card for receiving the holder's signature. This may be accomplished by providing an appropriate nonerasable strip that is adhered to either side of the completed card; such a strip being described in U.S. Pat. No. 2,903,276.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. An adhesive for joining a gelatin emulsion layer to a substrate, said adhesive comprising an aqueous dispersion of an adhesive composition consisting essentially of from about 60 to about 90 percent by weight of a copolymer latex of poly(vinyl acetate) copolymerized with an alkyl ester of an unsaturated carboxylic acid, from about 5 to about 15 percent by weight of a gelatin, from about 0.5 to about 10 percent by weight of a gelatin plasticizer and from about 5 to about 20 percent by weight of an attack solvent for said substrate; wherein said gelatin plasticizer is selected from the group consisting of formamide, poly (ethylene glycol), methyl pentane diol, dicarbitol succinate and dimethoxy tetraethylene glycol and said substrate attack solvent is selected from the group consisting of methyl isobutyl ketone, cyclohexanone, methyl ethyl ketone, and poly(vinyl methyl ether) as a 15 percent by weight solution in methyl ethyl ketone.

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