FINANCIAL TRANSACTION CARD

Field of the Invention

This invention relates in general to financial transaction cards and is concerned in particular with the provision of viewable graphical representations and character sets on such cards.

Background Art

The essential components of the structure of most financial transaction cards are a substrate or core which is commonly formed of one to three layers of a polyvinylchloride (pvc) plastics composition, overlaid on both sides with a clear, relatively thin polymer layer that acts as a protection for the printed matter on the outer faces of the substrate or core. These layers are laminated together in sheets from which the individual cards are stamped. The cards typically also include a magnetic stripe, a signature strip, and a hologram or other optically variable device on an applied segment of metal foil.

In a known modification of this structure, a continuous metal-containing layer, eg. a metallic foil or a metal/polymer composite, is applied to the substrate and printed ink graphics applied by screen printing the metal-containing layer, after which the clear protective overlay is applied over the printed metal-containing layer. The metal-containing layer is commonly a metallic foil that covers the entire surface of the substrate or core and may be applied from a carrier film using a heat-activated adhesive coated on the foil or the substrate. Interesting artistic effects that incorporate the optical properties of the metallic foil can be achieved with this construction.

A further development of such foil-faced financial transaction cards with graphics printed on the foil is disclosed in international patent publication WO 01/69521. In this disclosure, the metal containing foil layer has a front surface with a printable topcoat layer thereon and a back surface mounted to the substrate or core. A layer of an adhesive is applied to the printable topcoat layer of the foil

and graphics are printed on the adhesive layer. The usual clear protective overlay is provided on the front surface of the printed adhesive layer. This modified construction is said to allow conventional offset lithography printing of the metallised surface of the substrate in an automated process.

Another prior disclosure of a metallised layer being placed on the substrate or core is to be found in European patent publication 1193080. Here, a metallic film deposited by printing is a preferred means of providing a confined reflective region of rectangular form towards one corner of the card. In this case, the optical properties of portions of the protective plastics overlay are selectively altered to form images in the overlay including over the reflective region. The image over the reflective region is found to be clearly visible even in diffuse light, thus enhancing the usefulness and visibility of the image as a security device.

It is an object of the present invention to provide a financial transaction card construction with which useful optical or graphical effects may be obtained.

Summary of the Invention

The invention essentially entails the concept of segmenting the reflective layer, typically metal foil, on the substrate and applying printing to other regions coplanar with the foil segments.

More particularly, the invention provides, in a first aspect, a financial transaction card that includes:

> a first layer forming a substrate. A second layer disposed on the first layer includes a plurality of metallic foil portions that define a flush upper surface of the second layer, and cooperate to form a display that is a pattern, graphical representation or character set. A substantially uniform overlay on the flush upper surface protects the second layer and the display is viewable through this overlay.

Preferably, said financial transaction card further includes a second substantially uniform overlay disposed on a side of the first layer opposite to the

second layer to protect the first second layer.

In a preferred aspect of the invention, the metallic foil portions are discontinuous separate portions. The metallic foil portions may have a holographic effect.

Advantageously said second layer further includes a plurality of areas containing a composition applied by printing, which printed areas are flush with said metallic foil portions to define said flush upper surface.

In a further preferred aspect of the invention, the composition applied by printing is a printing ink. The printing method may be any appropriate method according to the result or effect desired, but high speed offset or lithographic printing is especially suitable.

In a preferred aspect of the invention, most or all of the first layer is covered by the second layer and the second layer substantially comprises said metallic foil portions and said printed areas. In particular applications, other elements may be incorporated into this layer, eg. an insert containing an optically variable or other security device.

At least one or more substantial portions of the substrate may be clear or transparent. Preferably the clear or transparent portion(s) include a region opaque to infrared light.

In an advantageous aspect of the invention, the overlay is a clear polyvinylchloride.

In the context of this invention, a reference to the overlay being substantially uniform includes the absence of localised working or of localised images in the transparent layer.

In an advantageous aspect, the card is a laminated assembly of said layers.

In an alternate embodiment, the invention provides a third layer disposed

on the opposite side of the first layer to the second layer. The third layer preferably includes a plurality of metallic foil portions that define a second flush upper surface of the third layer, and co-operate to form a second display that is a pattern, graphical representation or character set. A second substantially uniform overlay on the second flush upper surface protects the third layer and the second display is viewable through this second overlay.

The invention further includes, in a second aspect, a method of forming a financial transaction card, including the steps of:

providing a first layer as a substrate;

applying to the first layer a second layer including a plurality of metallic foil portions, which metallic foil portions are applied so as to define a flush upper surface of said second layer, and cooperate to form a display that is a pattern, graphical representation or character set; and

applying to the flush upper surface of the second layer a substantially uniform overlay which thereafter protects said second layer and through which said display is viewable.

In a preferred aspect of the method of the invention, the metallic foil portions are applied to the second layer by depositing the portions in a heat transfer process. This process may include the use of a heat and/or pressure sensitive adhesive provided on the rear surface of the metallic foil portions prior to application, or on the substrate.

In a preferred aspect of the invention, the printed areas are applied by any appropriate method according to the result or effect desired, but high speed lithographic printing is especially suitable.

Brief Description of the Drawings

The invention will now be further described, by way of example only, with

reference to the accompanying drawings, in which:

Figure 1 is a plan view of a financial transaction card formed in accordance with the invention; and

Figure 2 is a not-to-scale cross-section on the line 2-2 in Figure 1 illustrating the structure of the card in accordance with an embodiment of the invention. The relative thicknesses of the layers do not reflect actual thicknesses, for purposes of enhanced illustration.

Embodiments of the Invention

The illustrated financial transaction card 10 is conventional to the extent that it includes a substrate or core 12, comprised of two layers 14, 15 of opaque pvc further laminated together, and a rear relatively thinner protective overlay 16 of clear pvc. Typically but not necessarily, the outer face of the layer 15 covered by overlay 16 will have been printed before application of the overlay. The top face of layer 14 may also be printed or may be blank. It will be understood that these details of the card may be greatly varied in a manner well understood in the art. For example, the core 12 may have one to three or more discrete layers further laminated together and these layers may each be wholly or partially opaque or transparent or include other known modifications. Each layer may or may not be printed. The core may be wholly clear or transparent.

Core 12 forms a first layer of the card on which is disposed a second layer 20 in a two-stage process. Layer 20 includes a plurality of metallic portions comprising metallic foil segments 22, and a plurality of areas 24 containing an ink composition applied by printing. Together, the foil segments 22 and printed areas 24 comprise a coplanar layer 20 with a flush upper surface 25. Layer 20 may include other elements, eg. a void 28 for locating an optical variable or other security device, or an issuer's or sponsor's logo insert. In a further embodiment another layer, similar to layer 20, may be disposed on the opposite side of core 12 between the core and overlay 16. This alternative embodiment is therefore a double-sided form of the invention.

Foil segments 22 are typically applied in a heat transfer process in which the foil segments are first coated with a heat and/or pressure sensitive adhesive and the appropriate heat and/or pressure applied after deposit to activate the adhesive and allow extraction of a carrier of the foil segments.

The metallic foil portions are selectively applied by programming the printing machine so that the foil segments 22 cooperate to form a display that is a pattern, graphical representation or character set. Typically, this pattern, graphical representation or character set will be recognisable by viewers. By way of example, the illustrated card displays the letters "LM" and an overlying tapered line, indicating the card issuing institution.

The foil segments 22 may be applied before or after formation of printed areas 24.

The final layer of the card construction, applied to the flush upper surface 25, is a substantially uniform transparent overlay 30, preferably comprised of a discrete thin layer applied in a lamination process. Overlay 30 is similar to rear overlay 16 and is typically formed, as conventionally, in a clear pvc. It acts to protect the second layer 20 and is such that the display 27 is viewable through the overlay. Overlay 30 may be adhesively coated for enhanced bonding.

It will of course be understood that security features such as a hologram, a signature panel, and a magnetic stripe would typically be applied to card 10 to form the fully completed card. An integrated circuit chip may also be applied, eg. if the card is a smart card or an electronic identity is required.

Exemplary thickness dimensions for card 10 are around 0.3mm for each of core layers 14, 15, and about 0.05mm for each of overlays 16 and 30 and layer 20.

It is found that a card formed in accordance with the invention results in an upper zone which is visually pleasing and adaptable to a wide range of optical or visual effects. It will be understood that particular visual effects can be achieve in a

variety of ways. For example, the surface of the metallic foil segments 22 can be treated to be highly reflective, matt, or other finish. The exact composition of overlay 30 can affect the final result, but it will be understood that this overlay is substantially uniform and typically conventional, by which is meant that the overlay is not locally overworked, eg. by heating, or otherwise treated to form localised images.

It will be appreciated by those familiar with the art that the printed areas 24 between the foil segments 22 can be applied by any suitable printing process, eg. screen printing, but inexpensive offset, lithographic or other printing processes are preferred. Because there is no attempt to overprint the foil segments, it is possible to avoid more expensive screen printing and possible to avoid the use of foil segments with specialised topcoats of the form disclosed, eg. in WO 01/69521. Furthermore, because overlay 30 is not being applied over an entire metallised covering, it would generally be possible to apply the overlay with adhesive in a simple lamination process.

It will be understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of these different combinations constitute various alternative aspects of the invention.

CLAIMS

1 A financial transaction card including:

a first layer forming a substrate;

a second layer disposed on said first layer including a plurality of metallic foil portions, which metallic foil portions define a flush upper surface of said second layer, and cooperate to form a display that is a pattern, graphical representation or character set; and

a substantially uniform overlay on said flush upper surface which protects said second layer and through which said display is viewable.

2 A financial transaction card according to claim 1, further including a second substantially uniform overlay disposed on a side of said first layer opposite to said second layer to protect the first layer.

3 A financial transaction card according to claim 1, further including a third layer disposed on a side of said first layer opposite to said second layer, said third layer including:

a plurality of metallic foil portions, which metallic foil portions define a flush upper surface of said third layer, and cooperate to form a second display that is a pattern, graphical representation or character set; and

a second substantially uniform overlay on said flush upper surface of said third layer, which protects said third layer and through which said second display is viewable.

4 A financial transaction card according to claim 1, 2 or 3, wherein said substantially uniform overlay(s) is substantially transparent.

A financial transaction card according to any preceding claim, wherein said metallic foil portions are reflective portions.

A financial transaction card according to any preceding claim, wherein said reflective portions are discontinuous separate portions.

A financial transaction card according to any preceding claim, wherein one or more of said foil portions have a holographic effect.

A financial transaction card according to any preceding claim wherein said second layer further includes a plurality of areas containing a composition applied by printing, which printed areas are flush with said metallic foil portions to define said flush upper surfaces of the second layer.

A financial transaction card according to claim 8 wherein said third layer also includes a plurality of areas containing a composition applied by printing, which printed areas are flush with said metallic foil portions to define said flush upper surfaces of the third layer.

A financial transaction card according to claim 8 or 9, wherein said composition applied by said printing is a printing ink.

A financial transaction card according to claim 8, 9 or 10, wherein said printing is high speed offset printing.

A financial transaction card according to claim 8, 9 or 10, wherein said printing is lithographic printing.

A financial transaction card according to any one of claims 8 to 12, wherein most or all of said first layer is covered by said second layer and said second layer substantially comprises said reflective portions or said printed areas.

A financial transaction card according to any preceding claim, wherein said second layer includes an optically variable or other security device.

15 A financial transaction card according to claim 4, wherein said transparent layer(s) is a clear polyvinylchloride.

16 A financial transaction card according to any preceding claim, wherein said card is a laminated assembly of said layers.

17 A financial transaction card according to any preceding claim, wherein at least one or more substantial portions of said substrate are clear.

18 A financial transaction card according to any one of claims 1 to 16, wherein at least one or more substantial portions of said substrate are transparent.

19 A financial transaction card according to claim 17 or 18, wherein said clear or transparent segment(s) include a region opaque to infrared light.

20 A method of forming a financial transaction card, including the steps of:

providing a first layer as a substrate;

applying to the first layer a second layer including a plurality of metallic foil portions, which metallic foil portions are applied so as to define a flush upper surface of said second layer, and cooperate to form a display that is a pattern, graphical representation or character set; and

applying to the flush upper surface of the second layer a substantially uniform overlay which thereafter protects said second layer and through which said display is viewable.

21 A method according to claim 20, wherein said metallic foil portions are applied to said second layer by depositing said portions in a heat transfer process.

22 A method according to claim 21, wherein said process includes the use of a heat and/or pressure sensitive adhesive provided on the rear surface of said metallic foil portions prior to application, or on the substrate.

23 A method according to claims 20, 21 or 22, wherein said second layer further includes a plurality of areas containing a composition applied by printing, which printed areas are flush with said metallic foil portions to define said flush upper surface.

24 A method according to claim 23, wherein said printed areas are applied by high speed lithographic printing.