

Card incorporating a visible valuable object

Field of the invention

The present invention concerns a card incorporating a visible valuable object. The card forms a substrate or support for this valuable
5 object. In particular, the valuable object is a small precious metal ingot or a valuable coin or piece. A "valuable coin or piece" means not only a coin or piece made of relatively expensive material, but also, for example, a commemorative piece, a medal or one or several jewels or gems.

The card, in bank card format and having a thickness which may be
10 greater than the ISO standard for bank cards, is used for example as an advertising medium or simply as a support for a valuable object given to a client, employee, sports person, the winner of a game, etc.

Background of the invention

15 It is known to place a small gold ingot of between 1 and 10 grammes in a cavity made in the body of a plastic card. In a first variant the card body has a through aperture the profile of which substantially fits that of the ingot. In another variant, the dimensions of the through aperture are larger than those of the ingot. Two transparent plastic sheets are laminated respectively
20 on the two surfaces of the pierced card body. The ingot is thus confined between the two plastic sheets. To hold the ingot in a substantially central position in the aperture, a flange or raised portion forming a frame is provided on one or both plastic sheets. The frame is obtained for example by thermoforming. It may also be affixed to one or both of the plastic sheets.
25 This frame surrounds the ingot so that the latter remains in a substantially

central position in the aperture. In particular, the two plastic sheets are welded together along the frame so as to form a closed pouch for the ingot. A transparent peripheral area is therefore obtained around the ingot. However, the thick frame inside the aperture is visible and unattractive.

5 Although transparent, the frame causes a visual deformation and prevents the side surface of the ingot from being properly seen. Moreover, the two plastic sheets can easily be deformed in the aperture area at the periphery of the transparent frame. In this area, and in the pouch where the ingot is located, air is generally trapped between the two plastic sheets. The card is
10 not, therefore, compact and it is possible for the ingot to be handled such that it moves out of the plane of the card body. Consequently, the card can easily be damaged and is of limited longevity.

Summary of the invention

15 It is an object of the present invention to provide a high quality card incorporating a valuable object, in particular, a small precious metal ingot or a valuable coin or piece, which displays the valuable object in a perfectly visible manner from all sides, i.e. in its entire three dimensional shape.

The present invention therefore concerns a card forming a support for
20 a valuable object incorporated in the card and including a card body or core with a through aperture in which the valuable object is arranged, the dimensions of said through aperture being larger than those defined by the contour of said valuable object in the main geometric plane of the card. This card also includes at least two transparent films respectively arranged on
25 both sides of the card body or core and respectively covering one side and the other of the valuable object, said valuable object being located in a central area of the through aperture so that there is a transparent peripheral area surrounding the object inside the through aperture. This card is characterized in that the valuable object is embedded in a transparent resin
30 which completely fills the area surrounding the valuable object between the

periphery of the through aperture and the valuable object so that the space remaining in the aperture around the valuable object is completely filled by the resin.

The present invention also concerns a method of manufacturing at least one card, forming a support for a valuable object incorporated in said card, which includes the following steps:

A) Taking a card body or core in the form of a plastic sheet having at least one through aperture.

B) Placing at least one valuable object respectively in said at least one through aperture, each valuable object having smaller dimensions than the corresponding aperture and being placed in said aperture so as to leave a visible peripheral area around said object which enables said object to be seen on all sides, each valuable object being held in a central area of the corresponding aperture by a permanent or temporary securing means or by a permanent or temporary positioning means.

C) Providing a transparent resin in each aperture so as to fill the space remaining around the valuable object placed therein.

D) Arranging an at least partially transparent first film and second film respectively on both sides of the card body or core, said two films covering the transparent resin and each valuable object.

Other particular features of the invention will be set out below in the detailed description of the invention.

Brief description of the drawings

The invention will be described below with reference to the annexed drawings, given by way of non-limiting example, and in which:

- Figure 1 is a perspective view of a card according to the invention which incorporates a small precious metal ingot in an aperture of larger dimensions.

- Figure 2 is a partial cross-section of a card according to the invention obtained via the first or second implementation of a manufacturing method according to the invention.
- Figures 3a to 3d show various steps of a first implementation of a method according to the invention of manufacturing a card forming a support for a valuable object.
- Figures 4a to 4e show various steps of a second implementation of a method according to the invention of manufacturing a card forming a support for a valuable object.

Detailed description of the invention

A card 2 according to the invention, forming a support for a valuable object 6 incorporated in said card, will be described below with reference to Figures 1 and 2. In the variant shown in the Figures, the valuable object is a small gold ingot which forms a flat object with a top surface 6a and a bottom surface 6b. Card 2 includes a card body or core 8 with a through aperture 4 in which the small gold ingot is arranged. The through aperture has larger dimensions than those defined by the contour of the ingot in the main geometric plane of the card which is parallel to the top surface 2a and bottom surface 2b thereof.

The card also includes at least two transparent films 12 and 14 respectively arranged on the two sides of the card body or core 8. These two films respectively cover the top and bottom surfaces of ingot 6. This ingot is located in a central area of through aperture 4 and a transparent peripheral area 16 is arranged around the ingot inside the through aperture. This transparent peripheral area is homogeneous and has, in particular, a width substantially equal to or greater than a millimetre (1mm). It forms an aperture in card 2 making the card see-through in peripheral area 16. It will be noted that the gold ingot thus appears to be floating in the air in the middle of the aperture in the card body. It is therefore easy to see the gold

ingot on all sides. The valuable object may thus be properly seen in three dimensions, i.e. it is easy to appreciate the volume thereof.

According to the invention, the gold ingot is embedded in a transparent resin 10 which entirely fills the area 16 peripheral to said gold
5 ingot. A "resin" includes, in particular, an adhesive. The peripheral area extends between the external contour of the ingot and the periphery of the through aperture, in other words between the lateral surface of the ingot and the wall of through aperture 4. As a result, the space remaining in this through aperture around the ingot is entirely filled by the resin. It will be
10 noted that the ingot may be formed of any precious metal. In other variants, the valuable object is a flat coin or piece, a small medal, a small work of art, a jewel or gem, etc.

According to the preferred variant shown in Figure 2, resin 10 also covers the top surface 6a and the bottom surface 6b of the small precious
15 metal ingot. Thus, the ingot is entirely covered by the resin which forms an adherent interface between the ingot and the two transparent external films 12 and 14. The resin thus fills any space remaining in aperture 4 and forms a rigid or semi-rigid mass between the two transparent films which each have, in the area of through aperture 4, a flat surface in the continuity of top
20 surface 2a, respectively bottom surface 2b of the card. The resin preferably has a certain elastic deformation capacity. Moreover, resin 10 is also spread over both surfaces of core 8 and forms two adherent films respectively between the core and the two transparent external films 12 and 14. The card according to this preferred variant thus has two entirely flat external
25 surfaces 2a and 2b and the card does not have any air pockets. It is compact and solid.

Generally, the invention also concerns a method of manufacturing at least one card forming a support for a valuable object incorporated therein, said method including the following steps:

A) A card body or core 8 is provided in the form of a plastic sheet having at least one through aperture 4.

5 B) A valuable object 6 is placed in through aperture 4, said valuable object having smaller dimensions than said aperture, and it is placed in the aperture so as to leave a visible peripheral area 16 around said object; which allows the valuable object to be seen on all sides in the card manufactured as explained above. The valuable object, in particular a small ingot, is held in a central area of the through aperture by a permanent or temporary securing means or by a permanent or temporary positioning
10 means.

C) A transparent resin is placed at least in the through aperture so as to fill the space remaining around the valuable object placed therein.

D) An at least partially transparent first film and second film are respectively arranged on both sides of the card body or core, said two films
15 covering the transparent film and the valuable object.

It will be noted that all the elements are provided in the manufacturing facility, which includes at least one work bench or surface. It will be noted that the steps of the aforementioned method may include sub-steps occurring at different times during the manufacture of the card incorporating
20 the valuable object. Thus the above steps are not necessarily successive steps as will become clear, in particular, in the second implementation which will be described below. In particular, the resin can be added in part several times. The permanent securing means is, for example, formed by the resin, which may be formed of various materials and specific adhesives.
25 In a variant which is not shown, this securing means may include a permanent means for positioning the valuable object in the central area of the aperture. For example, thin arms are arranged projecting from the periphery of the aperture towards the central area, said thin arms forming part of the core of the card. The arms may be made when the aperture is
30 cut out. Two vertical and two horizontal arms may be provided respectively starting from the middle of the four sides defined by the periphery of the

aperture. The temporary securing means may be formed by a low adherent adhesive, a silicon paste, etc. The temporary positioning means may be formed by a fitting device, work pins or by a gripping or picking arm for the valuable object which has been used for bringing and placing the object in the aperture, then finally for holding the object in the central area until part of the resin placed in the through aperture has at least partially solidified. It will be noted that the resin can be placed in the aperture before or after the valuable object is placed in the aperture, and deposited in peripheral area 16. Those skilled in the art may devise several variants for positioning and holding the valuable object in the desired position during the manufacture of the card, at least until at least part of resin 10 placed in the through aperture has hardened sufficiently to be able to position and hold said valuable object itself in the central area of the through aperture.

It will be noted that the method according to the invention advantageously provides for the batch manufacture of cards. Thus, a plastic sheet of a certain thickness is provided, selected, in particular, according to the thickness of the valuable object concerned, and having a plurality of through apertures in which a plurality of valuable objects are respectively placed. The resin is added simultaneously for all the cards being manufactured. The transparent external films are also provided with substantially the same dimensions as the plastic sheet. A final cutting step is provided in order to obtain the individual cards. It will also be noted that the plastic sheet and/or plastic films may include various patterns, prints and/or security elements and/or information relating to the valuable object. In particular, at least one of the transparent films is suitable for laser printing.

A first implementation of the method of manufacturing cards each forming a support for a valuable object will be described below with reference to Figures 3a to 3d. The method of manufacturing one card will be

described below, but the same method can easily be applied to the batch manufacture of several cards, as indicated above.

Transparent film 12 with a first part 10a of the resin on the top surface thereof are placed in a press and core 8 with through aperture 4 is placed on top. The core may evidently be placed on the resin before the assembly is placed in the press to carry out the assembling operation. In a preferred variant, a roller press is used to carry out the assembling operation. This removes the presence of air bubbles between the transparent film and the core. While the first part 10a of the resin is still sufficiently liquid (viscous liquid state) to allow penetration, the small ingot 6 is added, by means of a gripping or picking tool provided, for example, with a suction system for holding the ingot by vacuum, and the ingot is deposited in the central area of aperture 4, preferably pressing on the resin present at the bottom of the aperture. Then, the first part of the resin is hardened to ensure the ingot is held in its initial position in the subsequent step. If necessary, the gripping or picking tool continues to hold the ingot until the resin is sufficiently rigid to hold the ingot in the desired position itself. When the resin is a thermosetting adhesive, heat may be provided to accelerate the polymerising of the adhesive during this phase. In another variant where the solidified resin can easily be melted again, resin 10a has already almost entirely solidified when the ingot is added. Since this ingot is formed of precious metal, it is heated prior to penetrating resin 10a and melts the resin locally, causing said resin to deform as a result of the pressure exerted on the ingot. In another variant, resin 10a may be melted locally at the bottom of the aperture just before the ingot is provided and partially penetrates the resin.

Once the ingot is held in a sufficiently rigid manner by the first part of the solidified resin, a second part 10b of the resin is placed on the top surface of core 8 and in aperture 4, particularly on the ingot. This resin is preferably deposited in the form of parallel strands initially separated by

grooves for the efficient removal of any residual air. The second transparent film 14 is then applied above using a roller press 20. After the second part of the resin has solidified, a card 2 according to the invention is obtained. The resin and the transparent films ensure that the ingot can be seen perfectly on all sides and zone 16 peripheral to said ingot is completely see through. The surface state of the card is of high quality, comparable to standards required for bank cards.

According to variants of the first implementation, the first part of the adhesive is either deposited directly onto a non-adherent work surface (for example made of silicon or Teflon®), or a non-adherent work sheet (silicon paper or a PE sheet) is provided and the first part of the resin is deposited on top. Likewise, to spread and fill the remaining space in aperture 4, a second work sheet can be used. Once resin 10a and 10b has solidified, an intermediate product is thus obtained. In order to finish the card, the two removable work sheets, which can easily be separated from the resin, are removed, and the two transparent films are applied to either side of the intermediate product. In order to do so, a press or roller presses can be used and a hot melt adhesive film or adhesive is advantageously provided in liquid form in order to assemble the transparent films to the intermediate product, which increases the flatness of the card. In another variant, the transparent external films are simply thermo-compressed against the two surfaces of the intermediate product.

With reference to Figures 4a to 4e, a second implementation of the manufacturing method according to the present invention will be described below.

A work sheet 24 is first of all placed on a work surface and the card body or core 8 is placed on top and held in a stable position relative to said work sheet. A low adherent adhesive 26, forming a means of temporarily fixing the ingot to the work sheet, is arranged on said work sheet at least in the region of the central area of through aperture 4. In a variant, this low

adherent adhesive is deposited on the bottom surface of the ingot which is then placed in said through aperture. It will be noted that instead of the low adherent adhesive, a paste or flexible film which adheres slightly to the ingot or matches the relief of said ingot may be provided to hold said ingot in place in the steps of Figures 4c and 4d. Next, a first part 10a of the resin is added at least in the through aperture. In a variant shown in Figure 4d, transparent film 12 is placed on this first resin part and applied using a press or roller 20. After this first resin part 10a has solidified, the assembly obtained is turned over and work sheet 24 and the low adherent adhesive 26 are removed. Finally, as shown in Figure 4e, a second part 10b of the resin is placed at least on ingot 6 and transparent film 14 is placed on the assembly and applied using a press or roller 20.

In this second implementation, several variants are possible. Thus, in one variant, instead of transparent film 12 in the step of Figure 4d, a second work sheet with low adherence to the resin is used to spread said resin in a uniform manner and to fill the space remaining in aperture 4. In another variant, the step of Figure 4e may also be achieved using a low-adherent work sheet. An intermediate product is thus obtained with two substantially flat surfaces after the work sheets have been removed. Therefore, the two transparent external films can be subsequently applied to the two sides of the intermediate product, as described with reference to the first implementation. It will be noted that it is also possible to envisage introducing a security element, for example an official stamp or hologram into, underneath or on top of the resin arranged between the card body or core and a transparent external film.

CLAIMS

1. Card (2) forming a support for a valuable object (6) incorporated into said card and including a core or body (8) with a through aperture (4) in which said valuable object is arranged, said through aperture having larger
5 dimensions than those defined by the contour of said valuable object in the main geometric plane of said card, said card further including at least two transparent films (12, 14) respectively arranged on the two sides of the core or body of said card and respectively covering one and the other side of the valuable object, said valuable object being located in a central area of said
10 through aperture so that a transparent peripheral area (16) surrounds the valuable object inside said through aperture, characterized in that said valuable object is embedded in a transparent resin (10) which completely fills said area peripheral to said valuable object between said object and the contour of the through aperture, so that the space remaining in said
15 aperture around said valuable object is completely filled by the resin.

2. Card according to claim 1, characterized in that said valuable object is a small precious metal ingot (6) or a valuable coin or piece, and in that said resin also covers the top surface (6a) and the bottom surface (6b) of said small precious metal ingot or said valuable coin or piece, said resin
20 thus forming an interface between said valuable object and the two transparent films.

3. Card according to claim 1 or 2, characterized in that, at least in the area of said transparent aperture, the two transparent films have entirely flat external surfaces.

25 4. Method of manufacturing at least one card forming a support for a valuable object (6) incorporated in said card, characterized in that it includes the following steps:

A) Taking a card body or core (8) in the form of a plastic sheet having at least one through aperture (4);

B) Placing at least one valuable object respectively in said at least one through aperture, each valuable object having smaller dimensions than
5 the corresponding aperture and being placed in said aperture so as to leave a visible peripheral area (16) around said object which enables said object to be seen on all sides, each valuable object being held in a central area of the corresponding aperture by a permanent or temporary securing means or by a permanent or temporary positioning means;

10 C) Providing a transparent resin (10a, 10b) in each aperture so as to fill the space remaining around the valuable object placed therein;

D) Arranging an at least partially transparent first film (12) and second film (14) respectively on both sides of the card body or core, said two films covering the transparent resin and each valuable object.

15 5. Manufacturing method according to claim 4, characterized in that a first part (10a) of said resin is first of all placed on a work surface or a work sheet to which said resin does not adhere or on said first film; then said card body or core and said at least one valuable object are placed on said first part of said resin; then, after said first part of the resin has at least
20 partially solidified, a second part (10b) of said resin is placed on said card body or core and on said valuable object; and finally said second film is placed on the second part of the resin, and, if not provided prior to the addition of said first part of the resin, said first film is placed on said first part of the resin, said first and second films being applied with pressure against
25 the card body or core.

6. Manufacturing method according to claim 5, characterized in that said card body or core and said work sheet or said first film are assembled by the first part of said resin, with an application of pressure, prior to the addition of said at least one valuable object in said at least one
30 through aperture.

7. Manufacturing method according to claim 4, characterized in that a work sheet (24) is first of all provided and said card body or core is placed on top thereof and held in a stable position relative to said work sheet, in that a low adherent film (26) forming a means of temporarily
5 securing said at least one valuable object to the work sheet, is provided either on said work sheet at least in the area of said at least one through aperture, or on the bottom surface of said at least one valuable object, said valuable object being then respectively placed in said at least one through
10 aperture, in that a first part (10a) of the resin is then placed at least in said at least one through aperture, and in that, after said first resin part has solidified, the assembly obtained is turned over and said work sheet and said low adherent adhesive are removed, and finally a second part (10b) of said resin is placed at least on said at least one valuable object.

8. Manufacturing method according to claim 7, characterized in
15 that said first film is placed on said first resin part and is applied using a press or a roller (20), and in that then said second film is placed on said second resin part and is applied using a press or a roller.