

DESCRIPTION

TITLE OF INVENTION: NON-CONTACT METAL CARD EMBEDDED WITH ANTENNA

TECHNICAL FIELD

The present invention relates to a metal card, and more particularly, to a non-contact metal card that is manufactured by using a metal material hindering wireless communication and is configured to be embedded with an antenna so as to operate in a non-contact manner.

BACKGROUND ART

Credit cards are used for identity verification, payment, credit offering, or the like. In addition, the shapes and designs thereof have become brilliant for giving artistic values and accessory functions. In addition, the shapes and designs of the credit cards have become important factors in selection of a credit card along with the functions of credit card services, discounting, and point granting. Therefore, card makers have made efforts to meet various needs of customers by devising cards that are brilliant not only in shape and design but also in function.

Korean Patent Laid-Open No. 10-2009-0054502 discloses a "sheet for a metal card and a metal card having the same", where the metal card is configured to include a metal sheet for the metal card and a fixing piece coupled with the metal sheet, and a more improved quality of the card can be allowed to be felt by metallic luster. Such a metal card can provide metallic luster and texture, but the metal sheet hinders wireless communication, so that there is a problem that the metal card cannot be applied to a card having a non-contact module

including an antenna.

Korean Patent Laid-Open Publication No. 10-2013-0051862, entitled "METAL CARD AND METHOD FOR MANUFACTURING THE SAME", discloses an inlay sheet having an antenna formed therein, a first protective sheet formed under the inlay sheet, a ferrite sheet composite formed on the inlay sheet, and a metal sheet formed on the ferrite sheet composite. The above-mentioned Korean Patent Laid-Open Publication discloses a metal card in which a protective sheet and a ferrite sheet are provided on and under the inlay sheet, and after that, a metal sheet is formed thereon. The above-mentioned metal card requires a large number of sheets such as protective sheets and ferrite sheets, so that the thickness of the card is increased, and an induction current generated by the antenna is interfered with by the metal sheet, so that there was a problem that the generation of the induction current is hindered.

In general, in the case where a metal plate moves in a magnetic field, a magnetic flux changes in a partial region of the metal plate, and as a result, an eddy current is generated in the corresponding region of the metal plate due to a change in magnetic flux. On the other hand, in the case of a metal card having a metal sheet, when the metal card is embedded with an antenna, a magnetic flux is changed by an induction current provided from the embedded antenna or an external terminal, and thus, an eddy current is generated in the metal sheet. Due to the eddy current generated in the metal sheet, the induction current of the antenna for data transmission and reception is attenuated, and thus, the wireless communication by using the antenna becomes difficult.

For this reason, there has been a problem in that it is not possible to use a non-contact module that provides wireless communication by using an antenna to a metal card that can

provide a metallic luster and texture in the related art. Therefore, it has been urgently required to develop a technique for a metal card embedded with a non-contact module including an antenna for transmitting and receiving data in a wireless manner.

SUMMARY OF INVENTION

TECHNICAL PROBLEM

An object of the present invention is to provide a non-contact metal card capable of transmitting and receiving wireless data by using an antenna by changing a structure of a metal sheet.

SOLUTION TO PROBLEM

According to an aspect of the present invention, there is provided a non-contact metal card embedded with an antenna including: a first body sheet having a body configured with a metal plate and having a first hole formed in a predetermined region of the body and a first slot formed by cutting off a portion between one side of the body and one side of the first hole; a second body sheet with the same size as that of the body of the first body sheet; an antenna inlay arranged between the first and second body sheets and configured with the antenna mounted on a film sheet or on a plate; and a card IC chip seated in a first hole of the first body sheet, wherein the first hole of the first body sheet is located in an inner region of the antenna.

In the non-contact metal card according to the first aspect, it is preferable that the body of the second body sheet has a body configured with a metal plate and has a second hole formed in a predetermined region of the body and a second slot formed by cutting off a portion between the one side of the body

and one side of the second hole, and wherein the second hole of the second body sheet is located in an inner region of the antenna.

In the non-contact metal card according to the first aspect, it is preferable that a surface of the first body sheet is configured so as to have electrical insulation.

In the non-contact metal card according to the first aspect, it is preferable that the non-contact metal card further includes a fixing member configured to be mounted on a region where the first slot of the first body sheet and the second slot of the second body sheet are formed so as to fix the first slot and the second slot.

In the non-contact metal card according to the first aspect, it is preferable that the fixing member is arranged along a direction perpendicular to the first slot and the second slot, and the fixing member includes: a body arranged along the direction perpendicular to the first slot and the second slot; and a blade protruding from one side of the body, the blade are folded in a folded shape so as to surround a portion of an edge of the first body sheet where the first slot is located or an edge of the second body sheet where the second slot is located, or the fixing member is formed in a loop shape, and a portion of the fixing member is arranged along a direction perpendicular to long axes of the first slot and the second slot.

In the non-contact metal card according to the first aspect, the antenna may be configured so that the antenna is mounted on a plate, the plate may include a first plate, a second plate, and a bar-shaped connection portion which connects the first and second plates to each other, the antenna may be arranged along an edge of an upper or lower surface of the plate to form a closed loop, the first hole of the first body sheet may be located in an inner region of the antenna of the first

plate of the antenna inlay, the second body sheet may have a second hole in a predetermined region of the body, and the non-contact metal card may further include a hologram sheet mounted on the second hole of the second body sheet.

According to a second aspect of the present invention, there is provided a non-contact metal card embedded with an antenna, including: a first body sheet having a body configured with a metal plate and having a first hole formed in a predetermined region of the body and a first slot formed by cutting off a portion between one side of the body and one side of the first hole; a second body sheet having a body configured with a metal plate and having a second hole formed in a predetermined region of the body and a second slot formed by cutting off a portion between one side of the body and one side of the second hole; an antenna inlay arranged between the first and second body sheets and configured with the antenna mounted on a film sheet or on a plate; and a card IC chip seated in a first hole of the first body sheet, wherein the first holes of the first body sheet and the second holes of the second body sheet are located in an inner region of the antenna to be formed at positions that face each other, and wherein the first slot of the first body sheet and the second slot of the second body sheet are formed at positions having a gap with a predetermined distance from each other and are spaced apart from each other.

In the non-contact metal card according to the second aspect, it is preferable that the non-contact metal card further includes an insulating layer having electrical insulation on a surface where the first body sheet and the second body sheet are in contact with each other.

In the non-contact metal card according to the second aspect, it is preferable that the card IC chip is configured as a combi-IC chip having both a non-contact card function and

a contact card function, so that the non-contact metal card constitutes a combi card.

ADVANTAGEOUS EFFECTS OF INVENTION

The present invention exhibit effects of reducing the thickness of a metal card embedded with a non-contact module including an antenna and normally generating an induction current the non-contact module including the antenna.

In addition, in the non-contact metal card according to the present invention, a body of the card is configured with a flat metal plates, and holes, each of which one side is opened by a slot are formed in the body of the card, so that it is possible to prevent an eddy current from being generated in the flat metal plate due to a magnetic field radiated from the antenna or an external terminal.

As a result, it is possible to provide a non-contact metal card capable of transmitting and receiving data in a wireless manner by using an antenna while using a body sheet of a flat metal plate.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view illustrating a non-contact metal card according to a first embodiment of the present invention.

Fig. 2 is an exploded perspective view illustrating a first example of a fixing member in the non-contact metal card according to the first embodiment of the present invention.

Fig. 3 is an exploded perspective view illustrating a second example of the fixing member in the non-contact metal card according to the first embodiment of the present invention.

Fig. 4 is an exploded perspective view illustrating a third example of the fixing member in the non-contact metal card

according to the first embodiment of the present invention.

Fig. 5 is an exploded perspective view illustrating a non-contact metal card according to a second embodiment of the present invention.

Fig. 6 is a cross-sectional view illustrating the non-contact metal card according to the second embodiment of the present invention.

Fig. 7 is a view illustrating wire bonding of a combi chip and an antenna in the non-contact metal card according to the second embodiment of the present invention.

Fig. 8 is an exploded perspective view illustrating a non-contact metal card according to a third embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

A non-contact metal card according to the present invention includes a first body sheet and a second body sheet that are configured with flat metal sheets and are stacked one above the other, an antenna inlay which is configured with an antenna mounted on a film sheet or a plate and is arranged between the first and second body sheets, holes that are formed in respective bodies of the first and second body sheets, and slots, each of which is formed by cutting off a portion between one side of each hole and one side of each body, wherein the holes are located in an inner region of the antenna. In the non-contact metal card according to the present invention having the above-described structure, the bodies configured with flat metal plates are provided with holes having a structure where a portion of one side is opened by a slot, so that it is possible to prevent an eddy current from being generated in the first and second body sheets which are flat metal plates, and thus, the non-contact metal card can transmit and receive data in a wireless manner by using an embedded

antenna.

Hereinafter, a structure and operations of embodiments of the present invention will be described in detail with reference to the accompanying drawings.

First Embodiment

Hereinafter, a structure and operations of a non-contact metal card according to a first embodiment of the present invention will be described in detail with reference to Fig. 1. Fig. 1 is an exploded perspective view illustrating the non-contact metal card according to the first embodiment of the present invention.

Referring to Fig. 1, the non-contact metal card 1 according to the first embodiment of the present invention includes a first body sheet 100, a second body sheet 110, an antenna inlay 120 which is arranged between the first and second body sheets, and a card IC chip 130.

A body 102 of the first body sheet 100 is configured with a flat metal plate, and a first hole 104 and a first slot 106 is formed in the body 102. The first hole 104 is a hole with a predetermined size passing through upper and lower surfaces of the body. The first slot is formed by cutting off a portion with a predetermined width between one side of the first hole 104 and one side of the body 102. The first body sheet 100 has a structure where one side of the first hole is opened by the first slot.

A body 112 of the second body sheet 110 is configured with a flat plate with the same size as that of the body of the first body sheet. The body of the second body sheet may be made of a metal material or may be made of other various materials. In the case where the body 112 of the second body sheet is configured with a flat metal plate, a second hole 114 and a second slot 116 are formed in the body 112. In addition, the second hole

114 is formed as a hole with a predetermined size passing through upper and lower surfaces of the body 112, and the second slot 116 is formed by cutting off a portion with a predetermined width between one side of the second hole 114 and one side of the body 112. In the case where the body of the second body sheet is configured with a flat metal plate, the second body sheet 110 has a structure where one side of the second hole is opened by the second slot.

It is preferable that the first body sheet and the second body sheet is configured so as to be electrically insulated from each other by vapor-depositing an insulating material or performing oxidation on the surfaces thereof so that the surfaces thereof have electrical insulation or by using an adhesive having electrical insulation in order to adhere the antenna inlay to the first and second body sheets.

The antenna inlay 120 is arranged between the first body sheet and the second body sheet and which is configured with an antenna 122 mounted on a film sheet or a plate. The antenna 122 constitutes a closed loop and. It is preferable that the first hole and the second hole are located in an inner region of the antenna.

It is preferable that the first body sheet and the second body sheet have a first depression (not illustrated) and a second depression (not illustrated) in the region where the antenna inlay is located, respectively. Therefore, the total thickness of the non-contact metal card according to the present invention is determined by the thickness of the first body sheet and the thickness of the second body sheet. It is preferable that the thickness of the antenna inlay is not included in the total thickness of the metal card.

It is preferable that the card IC chip is seated in the first hole of the first body sheet. In addition, it is

preferable that the first hole is formed with the same size as that of the card IC chip so that the card IC chip is accurately seated in the first hole.

In the case where the non-contact metal card is a combi card, the card IC chip may be configured with a combi-IC chip having both a non-contact card function and a contact card function. Meanwhile, in the case where the non-contact metal card is a hybrid card, the card IC chip is configured as a contact IC chip, and a non-contact IC chip connected to an antenna is mounted on the antenna inlay.

In the non-contact metal card according to the present invention, in the case where the positions of the first slot and the second slot of the first and second body sheets coincide with each other, voids are formed on one side of the metal card, and thus, the strength thereof is lowered, which causes not only a problem that the card is easily bent or broken but also a problem that the appearance is poor. Therefore, it is preferable that the non-contact metal card according to the present invention further includes a fixing member for fixing the first and second slots. The fixing member may be manufactured in various forms, and a plurality of examples of the fixing member will be described with reference to Figs. 2 to 4.

Fig. 2 is an exploded perspective view illustrating a first example of the fixing member in the non-contact metal card according to the first embodiment of the present invention. Referring to Fig. 2, the fixing member 240 according to the first example is configured in a polygonal flat plate shape such as a quadrangle. The fixing member is arranged between the first body sheet and the second body sheet and is arranged between the first slot of the first body sheet and the second slot of the second body sheet along a direction perpendicular to long

axes of the first slot and the second slot.

A first depression (not illustrated) and a second depression 218 for arranging the fixing member 240 are formed on the facing surfaces of the first body sheet and the second body sheet, respectively. The fixing member is located in the first depression and the second depression which face each other. By the fixing member 240, a region including the first slot of the first body sheet and the second slot of the second body sheet can be stably fixed. In this case, it is preferable that the fixing member is formed with at least one or more protrusions at an edge which is not exposed to the outside, so that the fixing member does not easily come out through the edge of the metal card.

Fig. 3 is an exploded perspective view illustrating a second example of the fixing member in the non-contact metal card according to the first embodiment of the present invention. Referring to Fig. 3, it is preferable that a fixing member 340 according to the second example is formed in a loop shape along the inner edges of the first and second body sheets or along the edge of the antenna inlay to be arranged between the first and second body sheets, and a partial region thereof is arranged along a direction perpendicular to the first slot of the first body sheet and the second slot of the second body sheet.

A first depression (not illustrated) and a second depression 318 for arranging the fixing member 340 are formed on the facing surfaces of the first body sheet and the second body sheet, respectively. The fixing member is located at the first depression and the second depression which face each other. The fixing member 340 can stably fix the area including the first slot of the first body sheet and the second slot of the second body sheet.

In the case where the fixing member 340 is made of a metal

material, it is preferable that the fixing member is formed in an open loop by cutting off a partial region 342, so that an eddy current is prevented from being generated by the fixing member.

Fig. 4 is an exploded perspective view illustrating a third example of the fixing member in the non-contact metal card according to the first embodiment of the present invention. Referring to Fig. 4, it is preferable that a fixing member 440 according to the third example is formed in a loop shape along the inner edges of the first and second body sheets or along the edge of the antenna inlay. The fixing member is arranged between the first and second body sheets, and a partial region thereof is arranged along a direction perpendicular to the first slot of the first body sheet and the second slot of the second body sheet. In this case, the fixing member further includes a blade 444 protruding from the body in a region which is in contact with the first slot and the second slot. The blade 444 is formed a folded shape with respect to the region which is in contact with the first and second slots and is configured so that the edge of the first body sheet having the first slot or the edge of the second body sheet having the second slot are fitted into the folded blade 444. Therefore, it is possible to obtain more stable fixation.

In the case where the fixing member is made of a metal, it is preferable that a partial region of the loop-shaped fixing member 442 formed in an open loop is configured so as to be cut off, so that an eddy current is prevented from being generated by the fixing member. Like this, the fixing member made of a metal is configured so that a partial region thereof is cut off, and thus, the antenna can transmit and receive data in a wireless manner without being affected by the first and second body sheets and the fixing member made of a metal.

A first depression (not illustrated) and a second depression 418 for arranging the fixing member 440 are formed on facing surfaces of the first body sheet and the second body sheet, respectively, and a third depression 408 to which the blade 444 having a folded shape is fixed is formed on an upper surface of the first body sheet 404. The fixing member is located in the first depression and the second depression which face each other, and an exposed surface of the blade 444 having a folded shape is seated in the third depression 408. The fixing member 440 can stably fix the region including the first slot of the first body sheet and the second slot of the second body sheet.

Second Embodiment

Hereinafter, a structure and operations of a non-contact metal card according to a second embodiment of the present invention will be described in detail with reference to Figs. 5 to 7. Fig. 5 is an exploded perspective view illustrating the non-contact metal card according to the second embodiment of the present invention.

Referring to Fig. 5, the non-contact metal card 1 according to the second embodiment of the present invention includes a first body sheet 100, a second body sheet 110, an antenna inlay 120 which is arranged between the first and second body sheets, and a card IC chip 130. The first and second body sheets may be made of duralumin or copper (Pt).

A body 102 of the first body sheet 100 is configured with a flat metal plate, and a first hole 104 and a first slot 106 formed in the body 102. The first hole 104 is a hole with a predetermined size passing through upper and lower surfaces of the body. The first slot is formed by cutting off a portion with a predetermined width between one side of the first hole

104 and one side of the body 102. The first body sheet 100 has a structure where one side of the first hole is opened by the first slot.

A body 112 of the second body sheet 110 is configured with a flat metal plate. A second hole 114 and a second slot 116 are formed in the body 112. The second hole 114 is a hole with a predetermined size passing through upper and lower surfaces of the body 112. The second slot 116 is formed by cutting off a portion with a predetermined width between one side of the second hole 114 and one side of the body 112. The second body sheet 110 has a structure where one side of the second hole is opened by the second slot.

It is preferable that the first slot of the first body sheet and the second slot of the second body sheet are formed at positions having a gap with a predetermined distance from each other so as to be spaced apart from each other. It is preferable that the first hole of the first body sheet and the second hole of the second body sheet are formed in an inner region of the antenna. In addition, it is preferable that the first hole of the first body sheet and the second hole of the second body sheet are formed at positions that face each other.

It is preferable that the first body sheet and the second body sheet are configured so as to be electrically insulated from each other by forming insulating layers by vapor-depositing an insulating material or performing oxidization on both or one of the facing surfaces of the first body sheet and the second body sheet or by using an adhesive having electrical insulation in order to adhere the antenna inlay to the first and second body sheets. In particular, in the case where the first and second body sheets are made of duralumin, the insulation treatment may be carried out by anodizing the first and second body sheets. In the case where

the first and second body sheets are made of copper, the insulating layers may be formed by electro-deposition coating or ceramic coating.

Fig. 6 illustrates a state where layers are stacked in the non-contact metal card according to the second embodiment of the present invention. Referring to Fig. 6, between the first body sheet 100 and the second body sheet 110, a first insulating layer 140 formed on one side of the first body sheet, a second insulating layer 150 formed on one side of the second body sheet, an adhesive layer 160 formed between the second insulating layer and the first insulating layer, and the antenna inlay 120 arranged between the adhesive layer and the first insulating layer are included. As illustrated in Fig. 6, insulating layers may be formed on both the first body sheet and the second body sheet, or an insulating layer may be formed on only one of the first body sheet and the second body sheet.

The antenna inlay 120 is arranged between the first body sheet and the second body sheet and which is configured with an antenna 122 mounted on a film sheet or a plate. The antenna 122 constitutes a closed loop and. It is preferable that the first hole and the second hole are located in an inner region of the antenna.

It is preferable that the first body sheet and the second body sheet have a first depression (not illustrated) and a second depression (not illustrated) in the region where the antenna inlay is located, respectively. Therefore, the total thickness of the non-contact metal card according to the present invention is determined by the thickness of the first body sheet and the thickness of the second body sheet. It is preferable that the thickness of the antenna inlay is not included in the total thickness of the metal card.

It is preferable that the card IC chip is seated in the

first hole of the first body sheet. In addition, it is preferable that the first hole is formed with the same size as that of the card IC chip so that the card IC chip is accurately seated in the first hole.

In the case where the non-contact metal card is a combi card, the card IC chip may be configured as a combi-IC chip having both a non-contact card function and a contact card function.

Fig. 7 is a view illustrating wire bonding of the combi chip and the antenna in the non-contact metal card according to the second embodiment of the present invention.

Referring to Fig. 7, contacts on both sides of the combi-IC chip 130 may be wire-bonded to contacts of the antenna 122 of the antenna inlay 120.

In the non-contact metal card according to the second embodiment of the present invention having the above-described configuration, the body sheets are configured with flat metal plates, the holes, each of which one side is opened by a slot are formed in the bodies of the body sheets, so that it is possible to prevent an eddy current from being generated due to a change in magnetic flux provided from the antenna or an outside. In general, when a magnetic flux changes on a flat metal plate, an eddy current is generated, and this eddy current hinders wireless data transmission and reception. Therefore, the non-contact metal card according to the present invention prevents the eddy current from being generated in the body sheets configured with the flat metal plates by the above-described structure. As a result, it is possible to provide a non-contact metal card capable of transmitting and receiving data in a wireless manner by using an antenna while using body sheets configured with flat metal plates.

Third Embodiment

Hereinafter, a structure and operations of the non-contact metal card according to a third embodiment of the present invention will be described in detail with reference to Fig. 8.

Fig. 8 is an exploded perspective view illustrating the non-contact metal card according to the third embodiment of the present invention. Referring to Fig. 8, a non-contact metal card 6 according to the third embodiment of the present invention includes a first body sheet 600, a second body sheet 610, an antenna inlay 620, a card IC chip 630 and a hologram sheet 640.

The antenna inlay 620 according to the present embodiment is configured to include an antenna 622 mounted on a plate, and the plate includes a first plate 624, a second plate 625, a bar-shaped connection portion 626 that connects the first and second plate to each other. The antenna 622 is arranged along the edge of the upper plane of the plate to form a closed loop.

A body 602 of the first body sheet 600 is configured with a flat metal plate, and a first hole 604 and a first slot 606 are formed in the body 602. It is preferable that the first hole is formed in an inner region of the antenna. The first slot 606 is formed by cutting off a portion with a predetermined width between the side of the first hole and the side of the body. In this manner, in the first body sheet one side of the first hole is opened by the first slot, so that it is possible to prevent an eddy current from being generated in the body which is the flat metal plate. The card IC chip 630 is seated in the first hole 604.

Similarly to the first embodiment, the second body sheet 610 may be configured with a flat plate having the same size as that of the first body sheet. In particular, in the case where the body 612 of the second body sheet is configured with

a flat metal plate, similarly to the first embodiment, a second hole 614 and a second slot 616 are formed in the body 612. A hologram sheet 640 is seated in the second hole 614.

It is preferable that the first hole 604 of the first body sheet is configured so as to be located in an inner region of the antenna of the first plate 624 of the antenna inlay, and the second hole 614 of the second body sheet is configured so as to be located in an inner region of the antenna of the second plate 625 of the antenna inlay.

A first depression and a second depression are formed on facing surfaces of the first body sheet and the second body sheet, respectively. The antenna inlay 620 is arranged between the first depression and the second depression.

In the case where the non-contact metal card is a combi card, the card IC chip may be configured as a combi-IC chip having both a non-contact card function and a contact card function. Meanwhile, in the case where the non-contact metal card is a hybrid card, the card IC chip is configured as a contact IC chip, and the non-contact IC chip connected to the antenna is mounted on the antenna inlay.

In the non-contact metal card according to the present invention having the above-described configuration, the body sheets are configured with flat metal plates, the holes, each of which one side is opened by a slot are formed in the bodies of the body sheets, so that it is possible to prevent an eddy current from being generated due to a change in magnetic flux provided from the antenna or an outside. In general, when a magnetic flux changes on a flat metal plate, an eddy current is generated, and this eddy current hinders wireless data transmission and reception.

Therefore, the non-contact metal card according to the present invention prevents the eddy current from being generated in the

body sheets configured with the flat metal plate by the above-described structure. As a result, it is possible to provide a non-contact metal card capable of transmitting and receiving data in a wireless manner by using an antenna while using body sheets configured with flat metal plates.

While the present invention has been particularly illustrated and described with reference to exemplary embodiments thereof, it should be understood by the skilled in the art that the invention is not limited to the disclosed embodiments, but various modifications and applications not illustrated in the above description can be made without departing from the spirit of the invention. In addition, differences relating to the modifications and applications should be construed as being included within the scope of the invention as set forth in the appended claims.

CLAIMS

1. A non-contact metal card embedded with an antenna comprising:

a first body sheet having a body configured with a metal plate and having a first hole formed in a predetermined region of the body and a first slot formed by cutting off a portion between one side of the body and one side of the first hole;

a second body sheet having a body configured with a metal plate with the same size as that of the body of the first body sheet and having a second hole formed in a predetermined region of the body of the second body sheet and a second slot formed by cutting off a portion between one side of the body of the second body sheet and one side of the second hole;

an antenna inlay which is arranged between the first and second body sheets and is configured with the antenna mounted on a films sheet or a plate; and

a card IC chip seated in a first hole of the first body sheet,

wherein the first hole of the first body sheet and the second hole of the second body sheet are located in an inner region of the antenna.

2. The non-contact metal card according to claim 1, wherein a surface of the first body sheet is configured so as to have electrical insulation.

3. The non-contact metal card according to claim 1, further comprising a fixing member configured to be mounted on a region where the first slot of the first body sheet and the second slot of the second body sheet are formed so as to fix the first slot and the second slot.

4. The non-contact metal card according to claim 3, wherein the fixing member is arranged along a direction perpendicular to long axes of the first slot and the second slot.

5. The non-contact metal card according to claim 4, wherein the fixing member includes:
a body arranged along the direction perpendicular to long axes of the first slot and the second slot; and
a blade protruding from one side of the body, and
wherein the blade is folded in a folded shape so as to surround a portion of an edge of the first body sheet where the first slot is located or an edge of the second body sheet where the second slot is located.

6. The non-contact metal card according to claim 3, wherein the fixing member is formed in a loop shape, and a portion of the fixing member is arranged along a direction perpendicular to long axes of the first slot and the second slot.

7. The non-contact metal card according to claim 6, wherein in the case where the fixing member is made of a metal, a partial region of the fixing member formed in a loop shape is cut off so that the fixing member is formed in an open loop.

8. The non-contact metal card according to claim 3, wherein the first and second body sheets further include respective depressions with a size corresponding to the fixing member in a region where the fixing member is mounted or arranged.

9. The non-contact metal card according to claim 1, wherein the first and second body sheets are adhered to each other by

using an adhesive having electrical insulation.

10. The non-contact metal card according to claim 1,
wherein the antenna is configured so that the antenna is
mounted on a plate,

wherein the plate includes a first plate, a second plate,
and a bar-shaped connection portion which connects the first
and second plates to each other, and

wherein the antenna is arranged along an edge of an upper
or lower surface of the plate to form a closed loop.

11. The non-contact metal card according to claim 10, wherein
the first hole of the first body sheet is located in an inner
region of the antenna of the first plate of the antenna inlay.

12. The non-contact metal card according to claim 11,
wherein the second body sheet has a second hole in a
predetermined region of the body, and

wherein the non-contact metal card further comprises a
hologram sheet mounted on the second hole of the second body
sheet.

13. The non-contact metal card according to claim 1, wherein
the card IC chip is configured as a combi-IC chip having both
a non-contact card function and a contact card function, so that
the non-contact metal card constitutes a combi card.

14. The non-contact metal card according to claim 1,
wherein the card IC chip is configured as a contact IC
chip,

wherein the antenna inlay is mounted with a non-contact
IC chip connected to the antenna, and

wherein the non-contact metal card constitutes a hybrid card.

15. A non-contact metal card embedded with an antenna, comprising:

- a first body sheet having a body configured with a metal plate and having a first hole formed in a predetermined region of the body and a first slot formed by cutting off a portion between one side of the body and one side of the first hole;

- a second body sheet having a body configured with a metal plate and having a second hole formed in a predetermined region of the body and a second slot formed by cutting off a portion between one side of the body and one side of the second hole;

- an antenna inlay which is arranged between the first and second body sheets and is configured with the antenna mounted on a film sheet or a plate; and

- a card IC chip seated in a first hole of the first body sheet,

wherein the first holes of the first body sheet and the second holes of the second body sheet are located in an inner region of the antenna to be formed at positions that face each other, and

wherein the first slot of the first body sheet and the second slot of the second body sheet are formed at positions having a gap with a predetermined distance from each other and are spaced apart from each other.

16. The non-contact metal card according to claim 15, further composing an insulating layer having electrical insulation on a surface where the first body sheet and the second body sheet are in contact with each other.

17. The non-contact metal card according to claim 16, wherein the insulating layer is formed by oxidizing the surfaces of the first body and second body sheets, by vapor-depositing an insulating material on the surfaces of the first body and second body sheets, or by using an adhesive for adhering the first body sheet and the second body sheet and having electrical insulation.

18. The non-contact metal card according to claim 15, wherein the card IC chip is configured as a combi-IC chip having both a non-contact card function and a contact card function, so that the non-contact metal card constitutes a combi card.