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(54) **A HOUSEHOLD APPLIANCE WITH AN IMPROVED FIRE SAFETY**

HAUSHALTSGERÄT MIT EINER VERBESSERTEN BRANDSCHUTZSICHERHEIT

APPAREIL MÉNAGER COMPORTANT UNE MEILLEURE PROTECTION CONTRE L'INCENDIE

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(56) References cited:

DE-A1-102009 045 542

DE-U1- 29 513 209

DE-U1-202006 007 341

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Description

[0001] The present invention relates to a household appliance, the fire safety of which is improved.

[0002] In household appliances, the casing wherein the electronic components are stored is closed by a cover. The covers have to be produced from metal due to probable insulation inability thereof. In some of the state of the art embodiments, the manufacturers produce the covers from metal (sheet metal, zamac alloys or aluminum etc.). Metal has no fire risk since it cannot inflame; however, the use of metal may be risky due to high electric conductivity of metal. In situations wherein metal covers are used, it is a legal obligation to ground the covers to the cabinet with a cable conforming to standards. The use of metal covers presents problems because of electrical risk and legal limitations. In the situation the covers are produced from plastic, there is no risk of the user getting an electric shock in the probable contact of the cover and the components since plastic is not a conductive material. Utilization of plastic covers is preferred for safety reasons. Furthermore, these covers do not burn even upon direct contact with flames due to flame retardant additives added into the plastic raw material. The most important risk in the situation the covers are made entirely from plastic is that the cover may be punctured by melting due to generation of high heat even though the cover does not burn. Particularly if other objects are stored on the refrigerator (for example old newspapers, paper bags, plastic bags etc.) the heat generated as a result of short circuiting can inflame the plastic materials inside the chamber having insufficient oxygen insulation.

[0003] In the state of the art International Patent Application No. WO2007128736, a refrigerator is explained, having a housing wherein the electronic components are kept and that is disposed into the insulating foam situated on the body. Documents DE202006007341U, DE29513209U, DE102009045542 disclose refrigerators with similar housings for electronic components placed therein.

[0004] The aim of the present invention is the realization of a household appliance which is provided with fire-safe utilization by protecting the electronic components placed thereon in a protected manner.

[0005] The present invention is disclosed in the independent claim 1. Further embodiments are disclosed in the dependent claims.

[0006] The household appliance realized in order to attain the aim of the present invention and explicated in the claims, comprises a body, a cut-out arranged on the body and a housing that protects the electronic components disposed into the cut-out. The electronic components are isolated from external factors like heat, vibration, oxygen as much as possible by means of the housing.

[0007] The household appliance of the present invention comprises a protector produced from plastic and mounted over the housing, and a cover produced from

metal and mounted on the protector, wherein the protector is fixed between the housing and the cover. The electronic components are stored safely without being inflamed by means of the metal cover. The housing is electrically insulated and safe utilization is provided by means of the plastic protector fixed between the housing and the cover that is produced from a metal with high electric conductivity. By means of the protector, the metal cover is not required to be grounded.

[0008] In an embodiment of the present invention, the household appliance comprises at least one hole arranged on the cover and at least one claw which enables the cover to be fixed to the protector by being inserted into the hole disposed on the protector. After the cover and the protector are joined, the cover can only be dislodged by the service personnel since the claw stretches in only one direction, providing safe usage.

[0009] In an embodiment of the present invention, the household appliance comprises a flange that is arranged on the protector and that surrounds the protector. During usage, the liquids that splash over the cover accidentally drain outside from the flange surface and the electronic components are prevented from being damaged by getting wet.

[0010] In an embodiment of the present invention, the household appliance comprises at least one protrusion that is disposed on the flange so as to be vertical to the flange surface and that at least partially surrounds the sides of the cover seated on the protector. The protrusion is thick enough to melt without burning and/or is produced from a material that melts without burning. Thus, the protrusion melts and seals the area between the cover and the protector.

[0011] In an embodiment of the present invention, the household appliance comprises an opening that is arranged on the protector and that enables fastening elements like screws to be mounted thereon, and a lug that overlaps with the opening, that enables the cover to be mounted easily on the housing together with the protector and wherein the fastening element is mounted.

[0012] In an embodiment of the present invention, the household appliance comprises a gap that is arranged on the housing and that enables the housing to be integrated with the protector and the cover by the fastening element bearing against the housing.

[0013] In an embodiment of the present invention, the household appliance comprises a recess arranged on the housing, wherein the claw is seated.

[0014] In an embodiment of the present invention, the household appliance comprises at least one separator that is disposed on the housing and that enables the electronic components to be placed therebetween and to be stored in a tidy manner. By means of the separator, the electronic components can be placed orderly without contacting one another.

[0015] In an embodiment of the present invention, the household appliance comprises a sheath that is situated on the housing and that allows the parts belonging to the

electronic components to pass therethrough. The electronic components are directed to the outside of the housing by being concealed in the sheath.

[0016] In an embodiment of the present invention, the household appliance comprises a sealing element that is disposed between the flange and the housing and that provides leak-proofing. The sealing element provides air-tightness between the outside environment and the housing and in the case of overheating prevents combustion by obstructing entrance of air into the housing.

[0017] In an embodiment of the present invention, the household appliance is a refrigerator.

[0018] The household appliance realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of the household appliance of the present invention.

Figure 2 - is the exploded view of the housing, the protector and the cover.

Figure 3 - is the perspective view of the housing, the protector and the cover.

Figure 4 - is the cross-sectional view of the housing and the protector.

[0019] The elements illustrated in the figures are numbered as follows:

1. Household appliance
2. Body
3. Cut-out
4. Housing
5. Protector
6. Cover
7. Hole
8. Claw
9. Flange
10. Protrusion
11. Opening
12. Lug
13. Gap
14. Recess
15. Sheath
16. Separator

[0020] The household appliance (1) comprises a body (2), a cut-out (3) arranged on the body (2), and a housing (4) that houses the electronic components disposed into the cut-out (3). The housing (4) enables the electronic components to be kept therein.

[0021] The household appliance (1) of the present invention comprises a protector (5) produced from plastic and mounted over the housing (4), and a cover (6) produced from metal and mounted on the protector (5). The electronic components are stored safely without the risk of burning by means of the cover (6) produced from metal materials like aluminum or zamac. The electronic components inside the housing (4) do not contact the metal

cover (6) produced from a metal having high electrical conductivity, the risk of electrical leakage and the user getting shocked are prevented by means of the protector (5) fixed between the metal cover (6) and the housing (4). By means of the plastic protector (5), the metal cover (6) is not required to be grounded.

[0022] In an embodiment of the present invention, the household appliance (1) comprises at least one hole (7) arranged on the cover (6) and at least one claw (8) that is disposed on the protector (5) and that enables the cover (6) to be fixed to the protector (5) by being inserted into the hole (7). The claw (8) functions in the direction of joining the cover (6) with the protector (5) and the cover (6) cannot be dislodged by the user. Thus, the housing (4) is almost entirely isolated from the outside environment and the safety of the user is provided.

[0023] In an embodiment of the present invention, the household appliance (1) comprises a flange (9) that is disposed on the protector (5) and that surrounds the protector (5). During usage, the liquids that splash over the cover (6) accidentally are moved away from the housing (4) by flowing outside over the flange (9) and prevented from reaching the electronic components in the housing (4).

[0024] In an embodiment of the present invention, the household appliance (1) comprises at least one protrusion (10) that is disposed on the flange (9) so as to be vertical to the flange (9) surface and that at least partially surrounds the sides of the cover (6) seated on the protector (5). The plastic protrusion (10) is thick enough to melt without burning in the case the electronic components inside the housing (4) are overheated. The gap between the housing (4) and the sides of the cover (6) is filled as a result of the melting of the protrusion (10). Thus, the housing (4) is almost insulated from the oxygen in the outer environment. The overheated electronic components are prevented from burning by blocking entry of air into the housing (4) through the sides of the cover (6).

[0025] In an embodiment of the present invention, the household appliance (1) comprises an opening (11) that is arranged on the protector (5) and that enables fastening elements like screw to be mounted thereon, and a lug (12) wherein the fastening element is mounted, that overlaps with the opening (11) and that enables the cover (6) to be mounted easily on the housing (4) together with the protector (5).

[0026] In an embodiment of the present invention, the household appliance (1) comprises a gap (13) that is arranged on the housing (4) and that enables the housing (4) to be integrated with the protector (5) and the cover (6) by the fastening element bearing against the housing (4). Joining the housing (4) with the protector (5) is facilitated by means of the fastening element and the gap (13), and a more rigid structure is obtained.

[0027] In an embodiment of the present invention, the household appliance (1) comprises a recess (14) arranged on the housing (4), wherein the claw (8) is seated. The housing (4) and the protector (5) are grouped firmly

by means of the claw (8) and the recess (14).

[0028] In an embodiment of the present invention, the household appliance (1) comprises at least one separator (16) that is disposed on the housing (4) and that enables the electronic components to be placed therebetween and to be stored in a tidy manner. The cables are arranged inside the housing (4) without being tangled by means of the separator (16).

[0029] In an embodiment of the present invention, the household appliance (1) comprises a sheath (15) that is situated on the housing (4) and through which the cables belonging to the electronic components pass. The sheath (15) enables the cables to be directed to the outside of the housing (4) in the desired direction.

[0030] In an embodiment of the present invention, the household appliance (1) comprises a sealing element that is disposed between the flange (9) and the housing (4) and that provides a leak-proof sealing. The sealing element provides airtightness between the outside environment and the housing (4) and in the case of overheating prevents combustion by obstructing entrance of air into the housing (4).

[0031] In an embodiment of the present invention, the household appliance (1) is a refrigerator.

[0032] By means of the present invention, the electronic components in the household appliance (1) are prevented from overheating and causing fire. The plastic protector (5) provides electrical insulation thus the requirement for grounding the metal cover (6) is eliminated.

Claims

1. A household appliance (1) comprising a body (2), a cut-out (3) arranged on the body (2), and a housing (4) that is disposed into the cut-out (3) and that houses the electronic components placed therein, wherein there is a protector (5) and a cover (6), wherein the protector (5) is mounted over the housing (4) and the cover (6) is mounted on the protector (5), wherein the protector (5) is fixed between the housing (4) and the cover (6), wherein the cover (6) is produced from metal, **characterized in that** the protector (5) is produced from plastic.
2. A household appliance (1) as in Claim 1, **characterized by** at least one hole (7) arranged on the cover (6), and at least one claw (8) that is arranged on the protector (5) and that enables the cover (6) to be fixed to the protector (5) by being inserted into the hole (7).
3. A household appliance (1) as in Claim 1 or 2, **characterized by** a flange (9) that is disposed on the protector (5) and that surrounds the protector (5).
4. A household appliance (1) as in Claim 3, **characterized by** at least one protrusion (10) that is disposed

on the flange (9) so as to be vertical to the flange (9) surface and that at least partially surrounds the sides of the cover (6) seated on the protector (5).

5. A household appliance (1) as in any one of the above claims, **characterized by** an opening (11) that is arranged on the protector (5) and that enables fastening elements like screw to be mounted thereon, and a lug (12), wherein the fastening element is mounted, that overlaps with the opening (11) and that enables the cover (6) to be mounted easily on the housing (4) together with the protector (5).
6. A household appliance (1) as in any one of the above claims, **characterized by** a gap (13) that is arranged on the housing (4) and that enables the housing (4) to be integrated with the protector (5) and the cover (6) by the fastening element bearing against the housing (4).
7. A household appliance (1) as in any one of the above claims, **characterized by** a recess (14) arranged on the housing (4), wherein the claw (8) is seated.
8. A household appliance (1) as in any one of the above claims, **characterized by** at least one separator (16) that is disposed on the housing (4) and that enables the electronic components to be placed in-between and to be stored in a tidy manner.
9. A household appliance (1) as in any one of the above claims, **characterized by** a sheath (15) that is situated on the housing (4) and through which the cables belonging to the electronic components pass.
10. A household appliance (1) as in any one of the above claims, **characterized by** a sealing element that is disposed between the flange (9) and the housing (4) and that provides a leak-proof sealing.
11. A household appliance (1) as in any one of the above claims, **characterized in that** it is a refrigerator.

Patentansprüche

1. Ein Haushaltsgerät (1) **umfasst** einen Körper (2), eine Aussparung (3), die am Körper (2) angeordnet ist und ein Gehäuse (4), das in der Aussparung (3) angeordnet ist und die darin platzierten elektronischen Komponenten umfasst; wobei eine Schutzvorrichtung (5) und eine Abdeckung (6) vorhanden sind und wobei die Schutzvorrichtung (5) über dem Gehäuse (4) und die Abdeckung (6) an der Schutzvorrichtung (5) angebracht sind, wobei die Schutzvorrichtung (5) zwischen dem Gehäuse (4) und der Abdeckung (6) befestigt ist und wobei die Abdeckung (6) aus Metall hergestellt ist, **gekennzeichnet**

ist es dadurch, dass die Schutzvorrichtung (5) aus Kunststoff hergestellt ist.

2. Ein Haushaltsgerät (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** mindestens ein Loch (7) an der Abdeckung (6) angeordnet ist und dass mindestens eine Klaue (8) an der Schutzvorrichtung (5) angeordnet ist und es ermöglicht, dass die Abdeckung (6) durch Einsetzen in das Loch (7) an der Schutzvorrichtung (5) befestigt wird.
3. Ein Haushaltsgerät (1), wie in Anspruch 1 oder 2 aufgeführt, **ist dadurch gekennzeichnet, dass** ein Flansch (9) an der Schutzvorrichtung (5) angeordnet ist und die Schutzvorrichtung (5) umgibt.
4. Ein Haushaltsgerät (1), wie in Anspruch 3 aufgeführt, **ist dadurch gekennzeichnet, dass** mindestens ein Vorsprung (10) an dem Flansch (9) so angeordnet ist, dass er senkrecht zu der Oberfläche des Flansches (9) steht und die Seiten des auf der Schutzvorrichtung (5) sitzenden Deckels (6) zumindest teilweise umgibt.
5. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine Öffnung (11) an der Schutzvorrichtung (5) angeordnet ist und die Befestigung von Befestigungselementen wie Schrauben daran ermöglicht, und eine Nase (12), in der das Befestigungselement montiert ist, die sich mit der Öffnung (11) überlappt und die es ermöglicht, die Abdeckung (6) leicht zusammen mit der Schutzvorrichtung (5) an dem Gehäuse (4) zu montieren.
6. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine Spaltung (13) an dem Gehäuse (4) angeordnet ist und es ermöglicht, dass das Gehäuse (4) durch das Befestigungselementlager gegen das Gehäuse (4) in die Schutzvorrichtung (5) und in die Abdeckung (6) integriert werden kann.
7. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine Aussparung (14), die an dem Gehäuse (4) angeordnet ist, in der die Klaue (8) sitzt.
8. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** mindestens ein Separator (16) an dem Gehäuse (6) angeordnet ist und es ermöglicht, dass die elektronischen Komponenten dazwischen platziert und ordnungsgemäß gelagert werden.
9. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** sich eine Ummantelung (15) an dem Ge-

häuse (4) befindet und durch dessen die zu den elektronischen Bauteilen gehörende Kabel verlaufen.

10. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** ein Dichtungselement zwischen dem Flansch (9) und dem Gehäuse (4) angeordnet ist und eine auslaufsichere Abdichtung bietet.
11. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** es ein Kühlschranks ist.

15 Revendications

1. Un appareil électroménager (1) comprenant un corps (2), une découpe (3) disposée sur le corps (2), et un boîtier (4) qui est disposé dans la découpe (3) et qui abrite les composants électroniques qui y sont placés, dans lequel il y a une protection (5) et un couvercle (6), dans lequel la protection (5) est montée sur le boîtier (4) et le couvercle (6) est monté sur la protection (5), dans lequel la protection (5) est fixée entre le boîtier (4) et le couvercle (6), dans lequel le couvercle (6) est fabriqué en métal, **est caractérisé en ce que** la protection (5) est fabriquée en matière plastique.
2. Un appareil électroménager (1) comme dans la déclaration 1, **est caractérisé en ce que** le couvercle (6) comporte au moins un trou (7) et que la protection (5) comporte au moins une griffe (8) qui permet de fixer le couvercle (6) à la protection (5) en l'insérant dans le trou (7).
3. Un appareil électroménager (1) comme dans la déclaration 1 ou 2, **est caractérisé en ce qu'il** comporte une bride (9) qui est disposée sur la protection (5) et qui entoure la protection (5).
4. Un appareil électroménager (1) comme dans la déclaration 3, **est caractérisé en ce qu'il** comporte au moins une saillie (10) qui est disposée sur la bride (9) de manière à être verticale par rapport à la surface de la bride (9) et qui entoure au moins partiellement les côtés du couvercle (6) posé sur la protection (5).
5. Un appareil électroménager (1) comme dans l'une quelconque des déclarations ci-dessus, **est caractérisé en ce qu'il** comporte une ouverture (11) qui est disposée sur la protection (5) et qui permet de monter des éléments de fixation comme une vis, et une patte (12), dans laquelle l'élément de fixation est monté, qui chevauche l'ouverture (11) et qui permet au couvercle (6) d'être monté facilement sur le boîtier (4) avec la protection (5).

6. Un appareil électroménager (1) comme dans l'une quelconque des déclarations ci-dessus, **est caractérisé en ce que** le boîtier (4) présente une fente (13) qui permet d'intégrer le boîtier (4) à la protection (5) et au couvercle (6) par le fait que l'élément de fixation s'appuie sur le boîtier (4). 5
7. Un appareil électroménager (1) comme dans l'une des déclarations ci-dessus, **est caractérisé en ce qu'il** comporte un évidement (14) disposé sur le boîtier (4), dans lequel la griffe (8) est placée. 10
8. Un appareil électroménager (1) comme dans chacune des déclarations ci-dessus, **est caractérisé en ce qu'il** comporte au moins un séparateur (16) qui est disposé sur le boîtier (4) et qui permet de placer les composants électroniques entre eux et de les ranger de manière ordonnée. 15
9. Un appareil électroménager (1) comme dans l'une des déclarations ci-dessus, **est caractérisé en ce qu'il** comporte une gaine (15) qui est située sur le boîtier (4) et à travers laquelle passent les câbles appartenant aux composants électroniques. 20
10. Un appareil électroménager (1) comme dans l'une des déclarations ci-dessus, **est caractérisé en ce qu'un** élément d'étanchéité est disposé entre la bride (9) et le boîtier (4) et assure un joint étanche. 25
11. Un appareil électroménager (1) comme dans l'une des déclarations ci-dessus, **est caractérisé en ce qu'il** s'agit d'un réfrigérateur. 30

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Figure 1

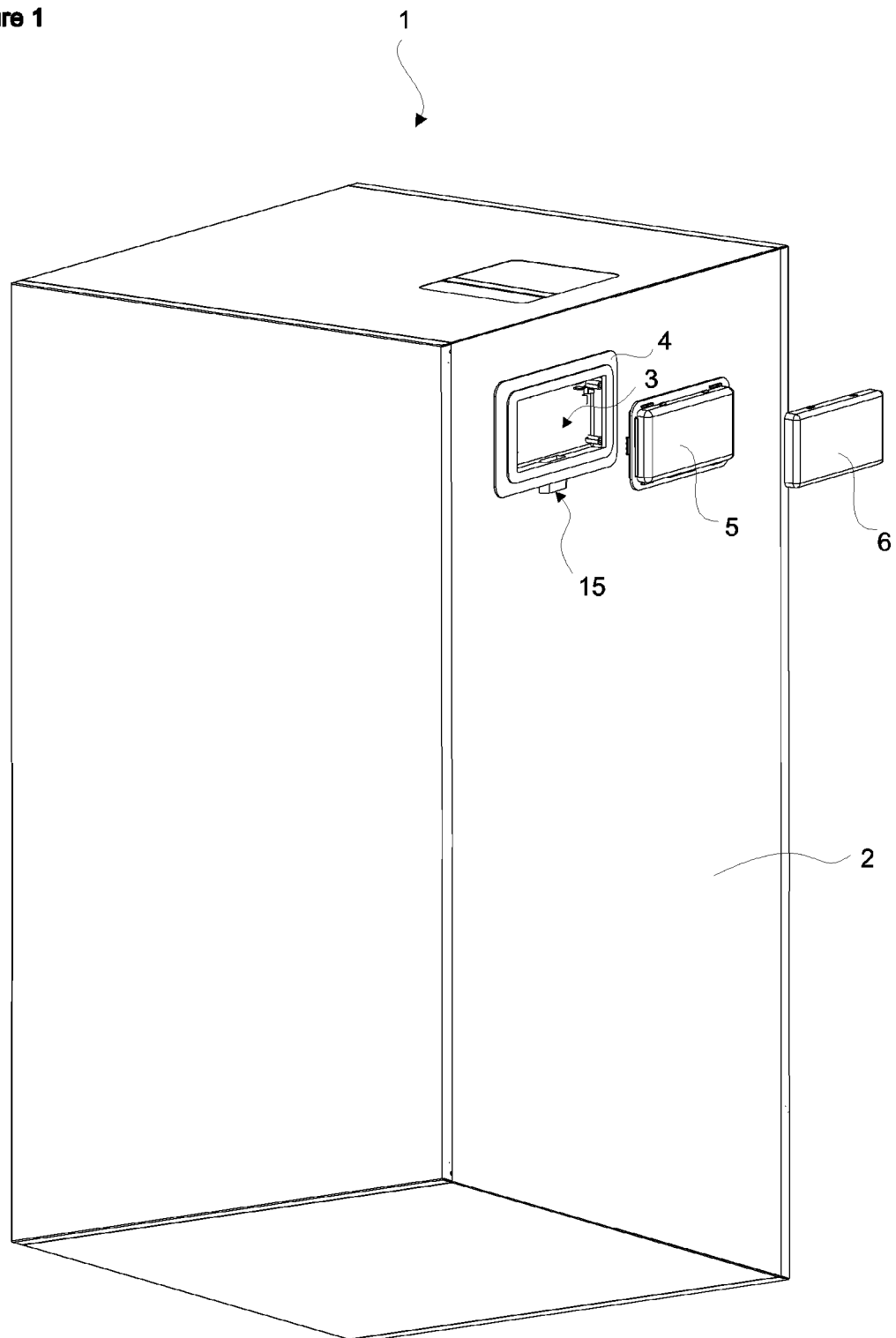


Figure 2

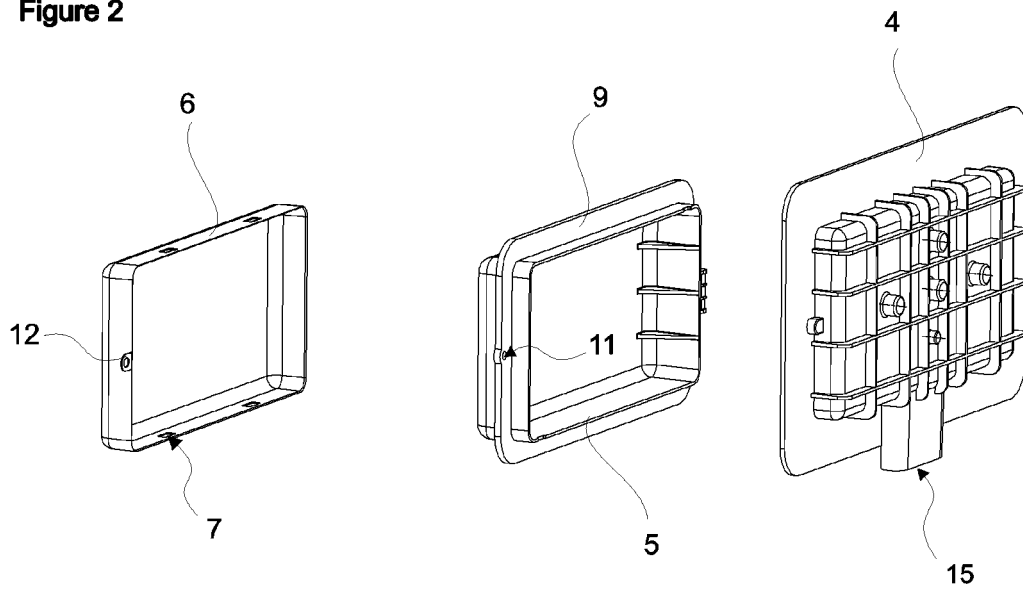


Figure 3

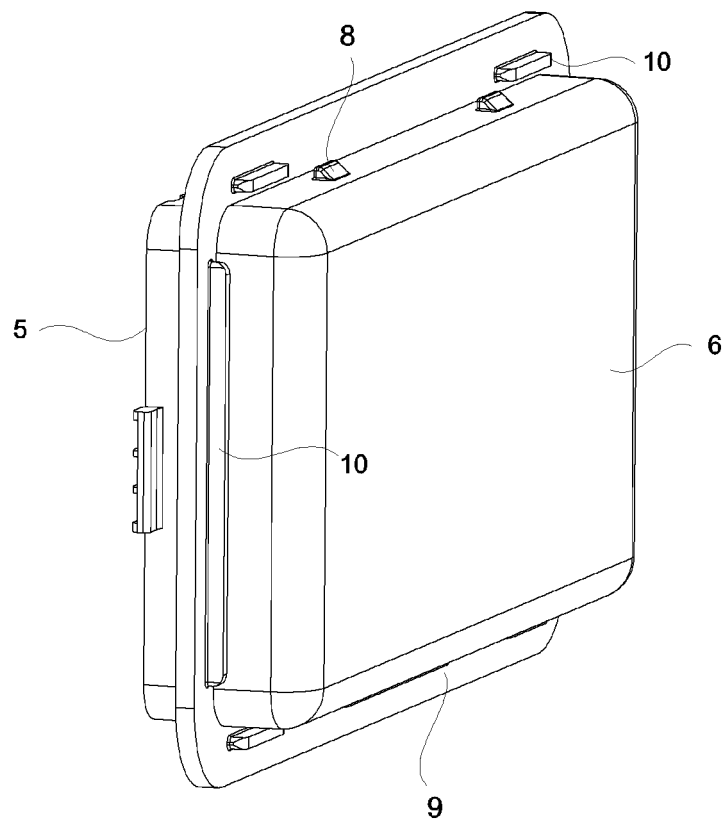
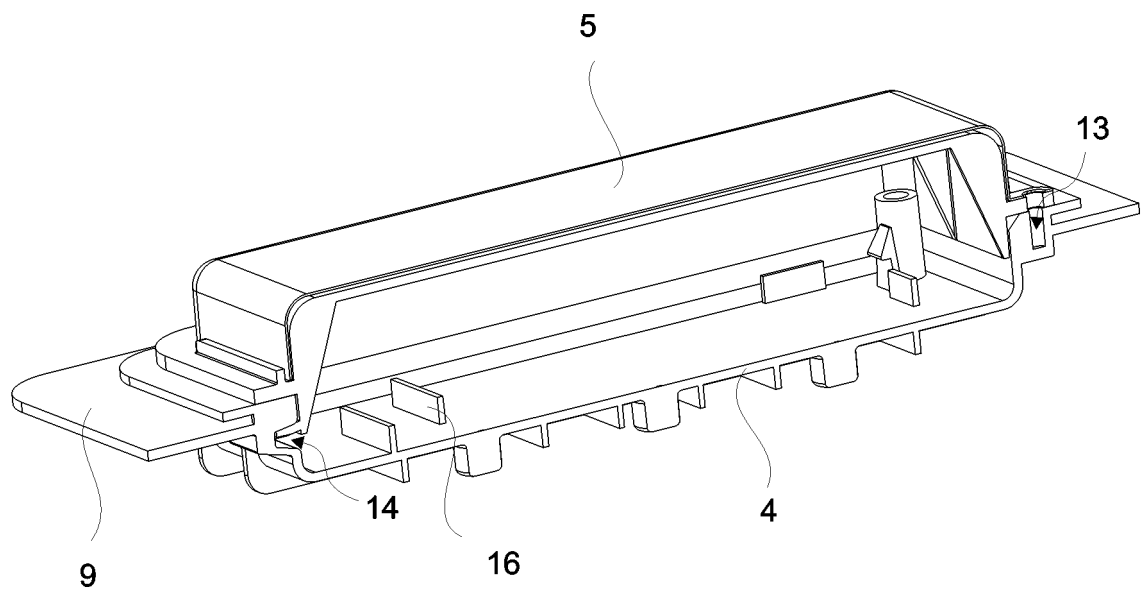


Figure 4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2007128736 A [0003]
- DE 202006007341 U [0003]
- DE 29513209 U [0003]
- DE 102009045542 [0003]