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(54) **BUTTON FOR ELECTRICAL MODULES**

(57) A button (1) is removably connectable to an electrical module, the electrical module being wall installable. The button (1) comprises a covering device (2) intended to cover at least partially the electrical module, and hooking means (3) configured to removably connect the covering device (2) to the electrical module. The button (1) is characterized in that at least the covering device (2) is made by means of a rolled product of a zinc-copper-titanium alloy.

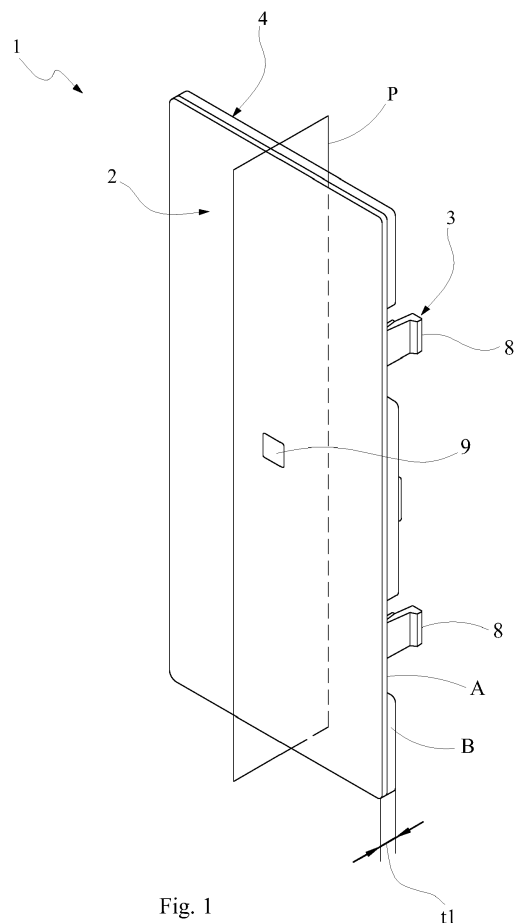


Fig. 1

Description

Technical scope

[0001] The present invention relates to a button that can be combined with an electrical module to be installed on the wall. The invention further concerns a kit comprising said button and said electrical module.

Technological background

[0002] In the technical sector of civil and industrial electrical systems, switches are commonly used comprising one or more buttons through which electrical contacts are closed or switched, for example for switching on or off light points. These switches can in turn be part of wall-installable electrical modules.

[0003] The buttons known in the technical sector of reference are typically made of plastic material. For example, US 4221941 suggests producing such buttons in moulded plastic.

[0004] Moulded plastic allows realizing complex shapes with large production volumes at minimal costs. However, this solution is not without disadvantages. First of all, the aesthetic result of the plastic buttons is not optimal. In fact, the area of the button that is pressed by the user tends to degrade, causing an unevenness in the appearance of the surface of the button over time. In addition, polymer-based materials are generally subjected to photo-degradation resulting in progressive yellowing and structural weakening of the surface of the button over time.

[0005] Added to these drawbacks is the fact that a considerable thickness of plastic is required to make a button sufficiently rigid so that it does not undergo significant deformations when a user acts with a finger on the surface of the button, i.e. during normal use of the button.

DESCRIPTION OF THE INVENTION

[0006] The technical problem underlying the present invention is that of realizing a button that can be combined with an electrical module, and a kit comprising said button and said electrical module, structurally and functionally designed to overcome at least in part one or more of the drawbacks complained about with reference to the cited prior art.

[0007] In particular, an object of the present invention is to provide a button whose surface of contact with the user is capable of transmitting a different sensation to the touch compared to the plastic buttons.

[0008] Another object of the invention is to provide a durable button over time, even following potential impacts during normal use.

[0009] An object of the invention is also to provide a structurally simple and compact button.

[0010] Finally, an object of the invention is to provide a button whose manufacture is simple and fast and does

not entail additional costs or undesirable environmental impacts.

[0011] This problem is solved and these objects are achieved at least in part by the invention by means of a button made in accordance with one or more of the features of the appended claims.

[0012] The button is preferably removably connectable to an electrical module, more precisely to a wall-installable electrical module.

[0013] The button comprises a covering device intended to at least partially cover the electrical module, and preferably hooking means configured to removably connect the covering device to the electrical module.

[0014] The covering device protects the button from accidental impacts and from photo-degradation.

[0015] Advantageously, at least the covering device is made by means of a rolled product of a zinc-copper-titanium alloy (hereinafter also referred to as "Zn-Cu-Ti alloy"). Of course, in some variants of the invention also the hooking means and/or other parts of the button described below can be made at least in part by means of the same rolled product.

[0016] It should be specified that, in this context, "rolled product" preferably means a product obtained by rolling, i.e. the mechanical process used to reduce the least significant size in a sheet, usually the thickness. Typically, the process takes place by means of opposed cylinders that, by rotating on themselves, imprint the desired shape on the material. The process may comprise several steps in each of which the rollers are arranged at a gradually decreasing distance.

[0017] Advantageously, the protective layer formed following contact of the Zn-Cu-Ti alloy with oxygen and water present in the atmosphere protects the surface of the button from localised degradation resulting from repeated actuation by the user.

[0018] In addition, the components present in the alloy of the rolled product in addition to zinc improve the features of the rolled zinc product. In particular, titanium gives greater resistance to permanent deformation over time, while copper increases the tensile strength of the material. In addition, the combination of titanium with copper reduces the coefficient of expansion of the alloy.

[0019] The addition of titanium increases the resistance of the material to deformation, especially under the effect of alternating thermal stresses. The addition of copper makes the alloy harder and increases its mechanical strength.

[0020] Generally, the covering device represents a visible part during normal use of the button. In this regard it is useful to note that the addition of copper gives the alloy a natural patina with a tendentially grey appearance by which it is possible to obtain a greater contrast between the colour of the covering device and the colour of the environment in which the button is installed, so as to make the button more visible to the user.

[0021] Preferably, the Zn-Cu-Ti alloy uses a titanium composition comprised between 0.06 and 0.20 % by

weight. Even more preferably, the titanium composition is comprised between 0.10 and 0.16 % by weight. Furthermore, the Zn-Cu-Ti alloy preferably uses a copper composition comprised between 0.08 and 1.00% by weight. Even more preferably, the copper composition is about 0.09 % by weight.

[0022] In some embodiments, the Zn-Cu-Ti alloy may be of the type commercially known under the trademarks Zintek, Rheinzink, VM Zinc or Elzinc. These alloys are typically used in construction for the realization of roofing or plumber components.

[0023] Preferably, the Zn-Cu-Ti alloy complies with the European standard EN 988 "Zinc and Zinc Alloys-Descriptions for flat-rolled products and for construction".

[0024] Thanks to its malleability, the Zn-Cu-Ti alloy can be easily worked allowing to make gaps, differences in height or particular angles. In addition, the Zn-Cu-Ti alloy offers great design freedom, combines complex shapes that are difficult to realize with other materials and bends due to weak radii of curvature. In addition, the Zn-Cu-Ti alloy has high corrosion resistance and durability.

[0025] The natural appearance of the Zn-Cu-Ti alloy is glossy grey by rolling, homogeneous and bright. Under the action of the atmospheric agents the surface is covered with a protective layer that remains stable over time and gives a natural aging giving the covering device of the button a pleasant slate grey aesthetic appearance. The protective layer formed following contact of the Zn-Cu-Ti alloy with oxygen and water consists of a layer of basic zinc carbonate that safeguards the metal. It is a natural process of protection of the Zn-Cu-Ti alloy that gives it a very long durability. Moreover, the Zn-Cu-Ti alloy does not need special maintenance. In fact, it continues to develop a protective patina throughout its life and this allows to correct the imperfections and scratches that the button can suffer over time.

[0026] The Zn-Cu-Ti alloy also allows a fairly simple surface finishing process with a consequent significant reduction in defects and therefore in the final waste when it is also wished to give different aspects and colourings with respect to the glossy grey colour by rolling.

[0027] The Zn-Cu-Ti alloy can be produced in the form of strips, metal sheets or bands through a rolling process that reduces the thickness of the strip through the use of rollers.

[0028] According to an advantageous aspect of the present invention, starting from a Zn-Cu-Ti rolled strip, one or more shearing and/or cold drawing, laser cutting, milling, bending or other mechanical machining operations are performed, to directly obtain the covering device of the button.

[0029] In some embodiments of the invention, the mechanical machining process of the rolled strip of Zn-Cu-Ti alloy may comprise forming operations such as single or multiple bending or punching and finally any surface finishing machining.

[0030] A further advantage linked to the use of the Zn-Cu-Ti alloy consists in the fact that the equipment for the

mechanical machining of the strip of such alloy can also be used for the production of other articles, for example electric plates, using metallic materials also different from the Zn-Cu-Ti alloy. In fact, unlike the processing of zamak, which is the most commonly used alloy for the manufacture of electric plates, the processing of the Zn-Cu-Ti alloy does not require the use of equipment specifically intended for this material. The use of the Zn-Cu-Ti alloy therefore allows adopting equipment suitable for also other types of material, to the advantage of the production elasticity, with moreover the possibility of developing surface finishes typical of each material, such as the typical anodizing of aluminium or galvanic and metallization treatments characteristic of other alloys.

[0031] Furthermore, the use of the Zn-Cu-Ti alloy for the manufacture of the covering device of the button has the advantage of excluding the use of harmful pollutants, both during the processing step and in its final application, thus ensuring respect for the environment. In fact, zinc is an environmentally friendly metal, which benefits from a favourable overall energy balance. 100 % of the rolled or processed zinc products at the end of their life cycle is recyclable and 95 % is actually recovered for different applications.

[0032] The present invention may also have one or more of the following preferred features in addition to those mentioned above.

[0033] Preferably, the covering device has a substantially planar structure. This feature makes it easy to obtain the covering device by rolling. In embodiments, the covering device has a substantially rectangular outer perimeter.

[0034] Preferably, the hooking means are associated with the covering device such that they move together with it. In this way, the button can be connected to the electrical module with the possibility of movement. Preferably, the button comprises a support to which the hooking means are associated, the covering device preferably being applied on the support in such a way as to at least partially cover the support. In this way the covering device can protect the surface of the support from wear and from photo-degradation.

[0035] Preferably, the hooking means are made integrally and monolithically in the support. This feature helps to simplify the manufacture of the support and increase the structural strength of the same.

[0036] Preferably, the hooking means and the support are made of polymeric material. This feature makes it possible to realize complex shapes with large production volumes at minimal costs.

[0037] Preferably, the support has a shape conjugated to that of the covering device. Furthermore, the covering device and the support are preferably coupled by gluing and/or co-moulding and/or shape coupling. These features facilitate the coupling between the support and the covering device.

[0038] Preferably, the button has a thickness such as to make the structure thereof rigid, the thickness of the

button being given by the sum of the thicknesses of the covering device and of the support. In this way the button does not tend to undergo significant deformations during its normal use.

[0039] Preferably, the support comprises a protuberance inserted in a complementary shaped seat defined in the covering device. This feature facilitates centring and anchoring the covering device with respect to the support.

[0040] Preferably, the protuberance is made integrally and monolithically in the support. This feature helps to increase the structural strength of the button.

[0041] Preferably, the seat is formed by an opening passing through the covering device. This feature helps to simplify the formation of the seat in the rolled product.

[0042] Preferably, the seat has a polygonal section adapted to accommodate a corresponding section of the protuberance in such a way as to achieve a prismatic coupling between the respective sections. This prevents relative rotation between the covering device and the support. Preferably, the sections of the protuberance and of the seat are square or rectangular. Preferably, the support comprises a front surface on which the covering device is applied and an opposed rear surface intended to face the electrical module.

[0043] Preferably, the hooking means protrudes with respect to the rear surface on the opposite side to the covering device.

[0044] Preferably, the support has an outer perimeter corresponding to the outer perimeter of the covering device. In this way the covering device can cover the support more effectively.

[0045] Preferably, the hooking means are arranged at or adjacent to the outer perimeter of the support. This feature gives greater stability to the coupling with the covering device.

[0046] Preferably, the hooking means comprise at least one male or female hooking element that can be coupled, for example by snap-fit, to a corresponding hooking element, respectively female or male, associated with the electrical module.

[0047] Preferably, the hooking means comprise a plurality of hooking elements arranged in opposed pairs, in particular symmetrically, with respect to a centre plane of the button. In this way the covering device is made reversible, i.e. it can also be mounted in an upside-down position. Preferably, the hooking elements are elastically deformable in a direction transverse to said centre plane for coupling, for example by snap-fit, with corresponding hooking seats obtained in the electrical module. Preferably, the covering device comprises one or more symbols that may be useful for identifying for instance the functionalities or the activation status of the button.

[0048] The rolled product of the Zn-Cu-Ti alloy allows the symbols to be realized in various ways. For example, the symbols can be obtained through laser engraving, micro-perforation, symbol blanking, digital printing or pad printing.

[0049] In one aspect, the present invention also refers to a kit comprising a wall-installable electrical module and at least one button having one or more of the features described in the present application.

[0050] The button and the electrical module are removably connected or connectable to each other such that the covering device at least partially covers the electrical module.

[0051] It will be appreciated that the preferred embodiments illustrated in relation to the above aspect are equally applicable also to the present aspect of the invention.

[0052] Preferably, the electrical module comprises a switching device of an electrical contact. The button is preferably connected to the electrical module with the possibility of movement, so as to control the switching device respectively in an open position and in a closed position of the electrical contact.

[0053] In embodiments, the button is connected to the electrical module with the possibility of tilting or axial movement.

[0054] In some embodiments, the electrical module comprises a switch, more precisely an axial control or tilting control switch.

[0055] In this regard it is preferred that the hooking means removably connect the button to the switch such that the button is manually operable so as to move with respect to the switch between at least a first operating position and a second operating position that are spaced apart from each other in order to establish or interrupt at least one electrical connection.

Brief description of the drawings

[0056] The characteristics and advantages of the invention will best result from the detailed description of a preferred embodiment thereof illustrated, by way of non-limiting example, with reference to the appended drawings wherein:

- Figure 1 is an axonometric view of a button made in accordance with the present invention;
- Figure 2 is an exploded view of the button of Figure 1; and
- Figures 3 to 5 are front views of embodiments of a detail of the button of the previous figures.

Preferred embodiment of the invention

[0057] In the figures, a button removably connectable to an electrical module (not shown) is indicated overall with 1.

[0058] The electrical module is preferably of the wall-installable type, in particular in an electrical box embedded in the masonry of a building, and it preferably comprises a switch to which the button 1 is connectable for manual operation of the electrical module. Examples of civil and industrial utilities that can be managed by the

button 1 via the electrical module include: lighting, safety, energy efficiency, multimedia, etc.

[0059] In preferred embodiments the electrical module comprises a box-like casing, preferably provided with one or more hooking elements configured to hook the module to a special support. For example, this support can be shaped as a frame and can be fixed to the wall in combination with the electrical box.

[0060] In some embodiments, a switching device configured to respectively open and close an electrical contact is present within the box-like casing.

[0061] Advantageously, the button 1 is connected to the module with the possibility of movement, for example tilting or axial, so as to control the switching device in the one or the other position of the electrical contact. It will therefore be appreciated that in preferred embodiments the electrical module may comprise a switch, preferably an axial control or tilting control switch.

[0062] The button 1 comprises a covering device 2 intended to at least partially cover the electrical module, in particular when the button and the electrical module are connected to each other. Under these conditions the covering device 2 is therefore generally visible and directly accessible to the user. In some embodiments, the covering device 2 has a substantially planar structure and preferably a substantially rectangular outer perimeter A. In fact, this shape has the advantage of simplifying the machining of the rolled product as much as possible. Of course, in some variants the covering device 2 may have a different shape, for example convex and/or rounded.

[0063] The covering device 2 is advantageously made of a zinc-copper-titanium alloy, more particularly a rolled product of such alloy.

[0064] The rolled product is preferably obtained by a rolling process. The covering device 2 therefore preferably has a thickness t_2 which is the result of the rolling process.

[0065] It should be specified that, in this context, the term "thickness" preferably refers to the measurement of the distance between the two outer and larger surfaces of the body in question.

[0066] The zinc-copper-titanium alloy can be for example one of the alloys known commercially under the trademarks of Zintek, Rheinzink, VM Zinc or Elzinc. In preferred embodiments, the alloy has a titanium composition comprised between 0.06 and 0.20 % by weight and/or a copper composition comprised between 0.08 and 1.00 % by weight.

[0067] The button 1 further comprises hooking means 3 configured to removably connect the covering device 2 to the electrical module. Preferably, the hooking means 3 are associated with the covering device 2 such that they move together with it.

[0068] In some embodiments, the button 1 comprises a support 4 of thickness t_4 , to which the hooking means 3 are associated. The support 4 has a shape preferably conjugated to that of the covering device 2, which is preferably applied on the support 4 in such a way as to at

least partially cover the support 4.

[0069] In preferred embodiments, the hooking means 3 are made integrally and monolithically in the support 4. The hooking means 3 and/or the support 4 can be made of polymeric material.

[0070] In the illustrated embodiment, the button 1 has a mainly planar development, except for any protuberances due to the hooking means 3. Of course, in some variants the button 1 may have a different shape, for example convex.

[0071] The button 1 has a thickness t_1 preferably given by the sum of the thicknesses t_2 , t_4 of the covering device 2 and of the support 4. The thickness t_1 of the button is advantageously sufficient to make the structure thereof rigid.

[0072] It should be noted that, in this context, the term "rigid" preferably means that the button 1 is not subjected to significant or appreciable deformations when a user acts with a finger on the surface of the covering device 2 during normal use of the button.

[0073] It will be appreciated that the overlapping of the covering device 2 on the support 4 allows to obtain a button 1 having greater mechanical strength with the same thickness t_1 , i.e. of less thickness t_1 (and therefore also less amount of raw material used) with the same mechanical strength, compared to a traditional button made entirely of polymeric material. Moreover, the increase in specific strength also results in a greater design freedom.

[0074] In order for the covering device 2 to cover the support 4, it is preferred that the support 4 has an outer perimeter B corresponding to the outer perimeter A of the covering device 2.

[0075] The support 4 preferably comprises a front surface 5 on which the covering device 2 is applied and an opposed rear surface 6 intended to face the electrical module. It is preferred that the front surface 5 and/or the rear surface 6 are mainly planar and/or substantially rectangular so as to conform to the geometry of the covering device 2.

[0076] To facilitate the hooking of the button 1 to the electrical module it is preferred that the hooking means 3 protrude with respect to the rear surface 6 on the opposite side to the covering device 2. For the same purpose it is further preferred that the hooking means 3 are arranged at or adjacent to the outer perimeter B of the support 4.

[0077] The hooking means 3 may comprise at least one male or female hooking element 8 which can be coupled by snap-fit to a corresponding hooking element, respectively female or male, associated with the electrical module. It should be noted that, in this context, "snap coupling" preferably means a reversible coupling.

[0078] In preferred embodiments, the hooking means 3 comprise a plurality of hooking elements 8 (four in the illustrated example) arranged in opposed pairs with respect to a centre plane P of the button.

[0079] In some embodiments, the hooking elements 8

are elastically deformable in a direction preferably transverse to the centre plane P of the button, to allow the snap coupling with corresponding hooking seats obtained in the electrical module.

[0080] In some embodiments, such deformability is given by the fact that each of the hooking elements 8 has a reduced thickness t8, in particular with reference to the thickness t4 of the support. The thickness t8 of the hooking elements is preferably defined in a direction transverse to the centre plane P of the button.

[0081] The covering device 2 and the support 4 can be coupled by gluing and/or co-moulding and/or shape coupling. In the present embodiment, they are coupled by means of a glue layer sandwiched between the covering device 2 and the front surface 5 of the support. Of course it is preferred to use a type of glue, or other equivalent adhesive material, which is suitable to ensure a stable fixation between the metallic material of the covering device 2 and the polymeric material of the support 4.

[0082] In some embodiments, the support 4 comprises a protuberance 9 inserted in a complementary shaped seat 10 defined in the covering device 2. This solution facilitates the centring and stable fixing of the covering device 2 with respect to the support 4. Of course, the protuberance 9 and its seat 10 can be located at or adjacent to the geometric centre of the button 1 or in any other position suitable to facilitate a precise positioning of the covering device 2 with respect to the support 4.

[0083] The protuberance 9 can be made integrally and monolithically in the support 4. The seat 10, on the other hand, can be formed by an opening passing through the covering device 2.

[0084] In the illustrated example the protuberance 9 develops from the front surface 5 of the support towards the covering device 2 in such a way as to cross the opening of the seat 10.

[0085] In some embodiments, the seat 10 has a polygonal section adapted to accommodate a corresponding section of the protuberance 9 in such a way as to achieve a prismatic coupling between the respective sections. The sections of the protuberance 9 and of the seat 10 may for example be square or rectangular. Thanks to this configuration, the rotation of the covering device 2 relative to the support 4 around the protuberance 9 is advantageously prevented, in particular at least during the assembly of the button 1 before the possible glue interposed between the covering device 2 and the support 4 hardens.

[0086] As shown in the examples of Figures 3 to 5, the covering device 2 may carry one or more symbols 11a, b, c which may be useful for identifying for example the functionality or the activation status of the button 1. In the example of Figure 3, a symbol 11a shaped like a bell is provided. In the example of Figure 4, two symbols 11b are provided, wherein one shaped as a zero "0" and the other shaped as a one "1", said symbols being adapted to identify respective opposed operating positions of the button 1. Finally, in the example of Figure 5 a symbol 11c

shaped as a lighting device, in particular as a light bulb, is provided. Of course, the symbols may comprise writing.

[0087] It is preferred that the symbols 11a, b, c are obtained on the covering device 2 on the opposite side to the hooking means 3 or to the possible support 4 in such a way that the symbols are visible to the user during normal use of the button 1.

[0088] In preferred embodiments, the covering device 2 has both one or more symbols 11a, b, c and the seat 10 accommodating the protuberance, as shown in the example of Figure 5.

[0089] The rolled product of the zinc-copper-titanium alloy allows the symbols 11a, b, c to be realized in various ways. For example, the symbols can be obtained by laser engraving, micro-perforation, symbol blanking, digital printing, or pad printing. In some embodiments, the symbols identify through openings susceptible to backlighting.

[0090] The invention thus solves the problem at hand by achieving numerous advantages including greater mechanical strength of the surface and of the construction structure of the button with the same thickness of the raw material used, as well as the possibility of subjecting the covering device of the button to processes or surface processings for aesthetic finish such as painting, metallization, or galvanic treatments.

Claims

1. Button (1) removably connectable to an electrical module, said electrical module being wall installable, said button comprising:

- a covering device (2) intended to cover at least partially said electrical module, and
- hooking means (3) configured to removably connect said covering device (2) to said electrical module,

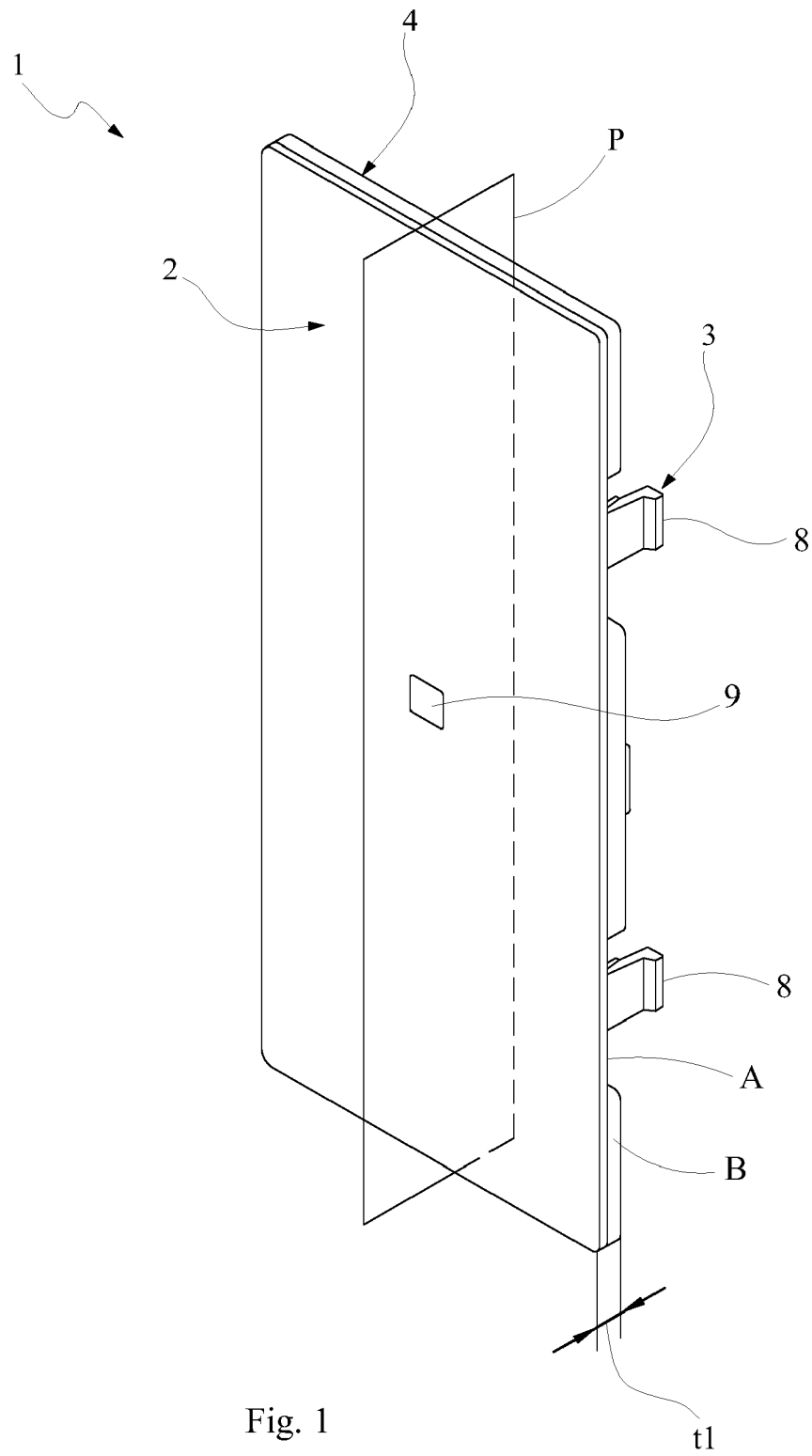
characterized in that at least said covering device (2) is made by means of a rolled product of a zinc-copper-titanium alloy.

2. Button (1) according to claim 1, wherein said zinc-copper-titanium alloy has a titanium composition comprised between 0.06 and 0.20 % by weight.

3. Button (1) according to claim 2, wherein said titanium composition is comprised between 0.10 and 0.16 % by weight.

4. Button (1) according to any one of the preceding claims, wherein said zinc-copper-titanium alloy has a copper composition comprised between 0.08 and 1.00% by weight, preferably said copper composition being about 0.09% by weight.

5. Button (1) according to any one of the preceding claims, wherein said rolled product is obtained by rolling.
6. Button (1) according to any one of the preceding claims, wherein said covering device (2) has a substantially planar structure. 5
7. Button (1) according to any one of the preceding claims, wherein said hooking means (3) are associated with said covering device (2) such that they move together with it. 10
8. Button (1) according to any one of the preceding claims, comprising a support (4) to which said hooking means (3) are associated, said covering device (2) being applied on said support (4) in such a way as to at least partially cover said support (4). 15
9. Button (1) according to claim 8, wherein said hooking means (3) are made integrally and monolithically in said support (4). 20
10. Button (1) according to claim 8 or 9, wherein said support (4) comprises a protuberance (9) inserted in a complementary shaped seat (10) defined in the covering device (2). 25
11. Button (1) according to claim 10, wherein said seat (10) has a polygonal section adapted to accommodate a corresponding section of said protuberance (9) in such a way as to achieve a prismatic coupling between the respective sections. 30
12. Button (1) according to any one of the preceding claims, wherein said covering device (2) comprises one or more symbols (11a,b,c) obtained by laser engraving, micro-perforation, symbol blanking, digital printing or pad printing. 35
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13. Kit comprising a wall-installable electrical module and at least one button (1) according to any one of the preceding claims, said button and said electrical module being removably connected or connectable to each other such that said covering device (2) at least partially covers said electrical module. 45
14. Kit according to claim 13, wherein said electrical module comprises a switching device of an electrical contact, said button (1) being connected to said electrical module with the possibility of movement, so as to control said switching device respectively in an open position and in a closed position of the electrical contact. 50
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15. Kit according to claim 14, wherein said button (1) is connected to said electrical module with the possibility of tilting or axial movement.



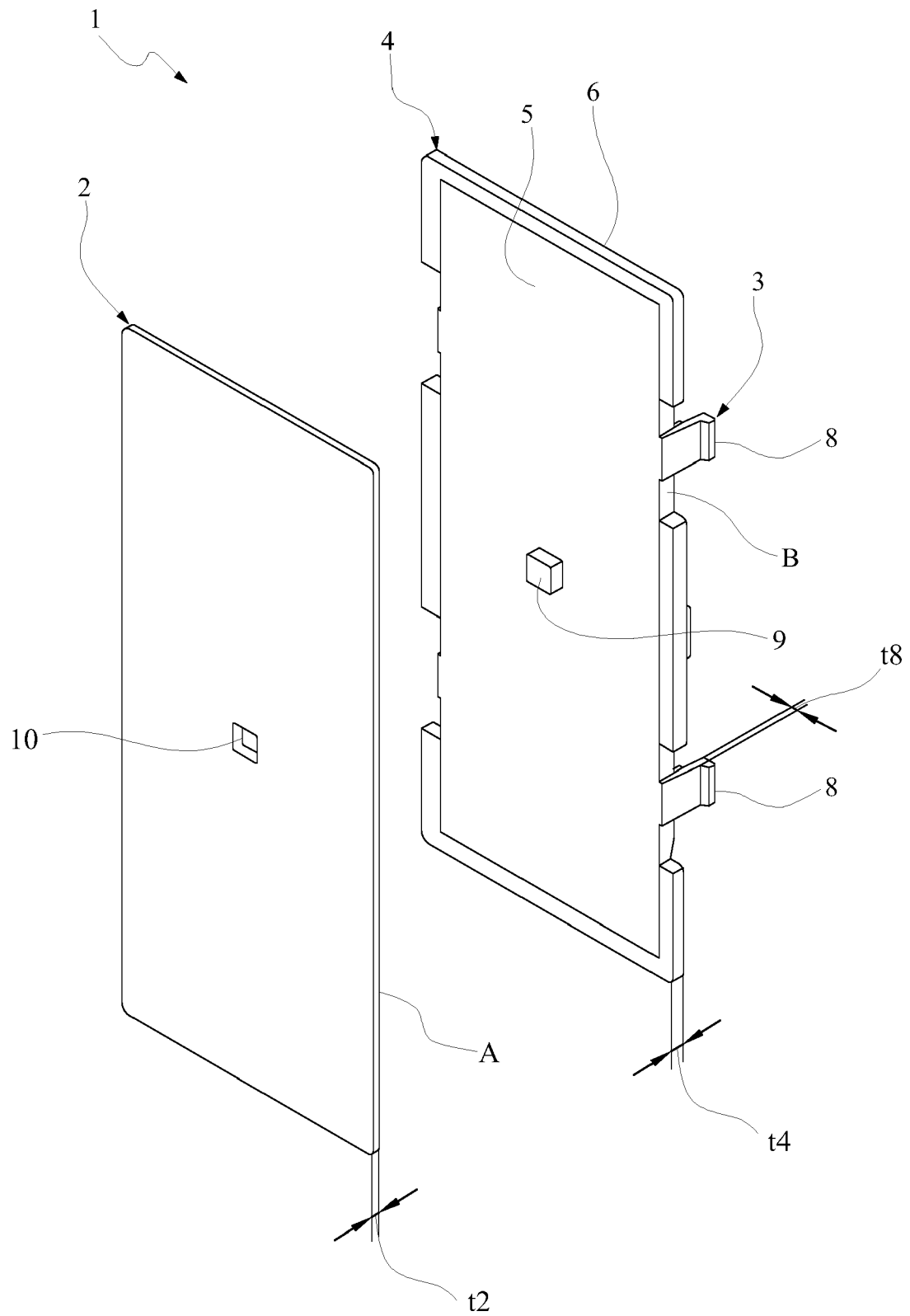


Fig. 2

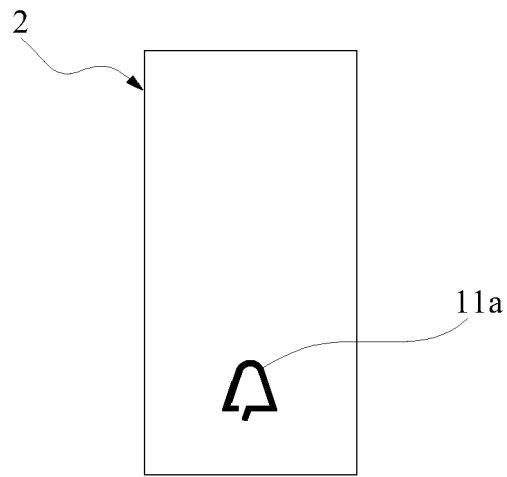


Fig. 3

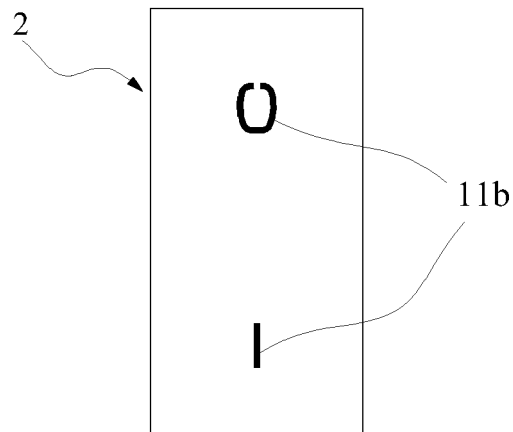


Fig. 4

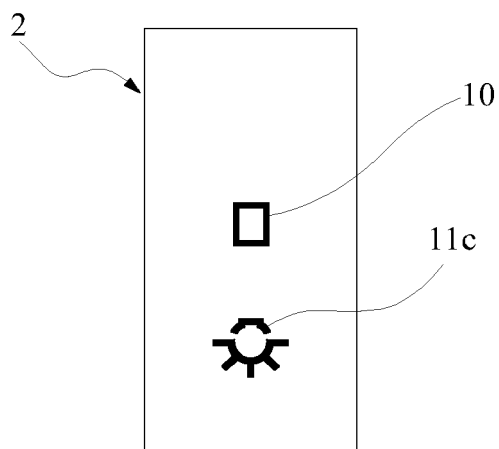


Fig. 5



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 2667

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2021/053643 A1 (VIMAR SPA [IT]) 25 March 2021 (2021-03-25)	1-3, 5-15	INV. H01H13/704
Y	* page 1, line 4 - page 13, line 24; figures 1-9 *	4	C22C18/02 H02G3/08
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			TECHNICAL FIELDS SEARCHED (IPC)
			H02G C22C H01H
The present search report has been drawn up for all claims			

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EPO FORM 1503 03.82 (P04C01)

Place of search	Date of completion of the search	Examiner
Munich	18 September 2023	Arenz, Rainer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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18-09-2023

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