

COVERING DEVICE FOR THE BUTTON OF AN ELECTRIC MODULE

DESCRIPTION

The present invention relates to a covering device which can be removably connected to an electric module, such as, for example, a button.

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The invention also relates to an electric device comprising the covering device which can be removably connected to an electric module.

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Generally, the button is connected to switches, by means of which electric contacts are closed or commutated, for example, for switching on or off light points. The switches can in turn form part of electric modules which can be connected to a support for electric modules. The support commonly comprises insertion slots, to which the modules for electric installations may be able to be connected. The button covering system may in turn be configured as a "blank button". In this case, the covering device can be mounted on a button which is in the form of a structure which can be connected to a support or a module for electric installations, for example, in order to cover an empty slot of the support for electric modules. Advantageously, the structure is not connected to a switch.

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In the context of the technical sector being referred to, there are known covering devices which are connected to buttons in order to protect those buttons, for example, from impacts, or to make them more visible to a user, for example, by means of colouring or a pattern which is produced on the covering device. Examples of such solutions are described in US 2020/037422, US 4221941 or US 2020/144007.

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In order to connect the covering device to the button, there are generally used threaded connections or an interlocking engagement system.

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The threaded connections provide a stable mechanical connection but have the disadvantage that they require a tool, for example, a screwdriver, in order to be able to dismount or mount the covering device on/from the button.

However, the interlocking engagement system allows the covering device to be dismounted or mounted from/on the button without using tools but it has the disadvantage of being particularly fragile. This involves a risk of the interlocking engagement system of the covering device breaking during the operation for mounting or dismounting the device on/from the button.

Therefore, the technical problem addressed by the present invention is to provide a covering device which can be removably connected to a button which is structurally and functionally configured to at least partially overcome one or more of the disadvantages set out with reference to the cited prior art.

In the context of this problem, an object of the present invention is to provide a covering device which is particularly versatile and which can be readily connected in a removable manner to an electric module, such as, for example, a button.

Another object of the present invention is to provide a covering device which is provided with an engagement system which is particularly resistant to the mechanical loads which occur during the operations for mounting and dismounting the covering device and during normal use of the electric device.

These problems are solved and these objects are achieved by the invention by means of a covering device which can be removably connected to an electric module and by means of a device for an electric installation which are constructed according to one or more of the features of the appended claims.

According to an aspect of the invention, the covering device which can be removably connected to an electric module, such as, for example, a button, comprises a member and an engagement system. The member includes a lower surface which is suitable for interfacing with the electric module and comprises two transverse sides, two longitudinal sides and a frame. The frame extends from the lower surface in a connection direction and extends along the sides of the lower surface. The frame includes two opposite longitudinal components and two opposite transverse components. The engagement

system includes engagement elements which are positioned near the longitudinal sides of the lower surface so as to be opposite in pairs with respect to a longitudinal plane, which extends in the connection direction and along a longitudinal axis of the lower surface. Each engagement element is resiliently deformable and formed to allow the connection with a respective connection element of the electric module.

The covering device to which the invention relates allows the production of a stable, reliable and robust connection with respect to the electric module, particularly as a result of the positioning of the engagement elements and the formation of the elements. Furthermore, the covering device can be mounted and dismounted on/from the electric module in a particularly easy manner by a user. The member of the covering device can advantageously be coloured or have a printed pattern, preferably on an external surface opposite the internal surface, for example, in order to be able to more easily display and recognize a specific module, to which the device is connected.

Preferably, the lower surface of the member of the covering device has a square shape, even more preferably a substantially rectangular shape. In a Cartesian reference system which is associated with the covering device, the two transverse sides extend parallel with a longitudinal direction of the covering device and the two longitudinal sides extend parallel with a transverse direction of the covering device. The longitudinal side preferably has a length between 4.5 cm and 5.5 cm. The transverse side preferably has a length between 1.5 cm and 2.5 cm.

The connection direction is substantially perpendicular to the plane which is defined by the longitudinal direction and the transverse direction. The connection direction is substantially perpendicular to the lower surface of the button.

Advantageously, the module on which the covering device is mounted forms part of a device for electric installations which can in turn be mounted on a support for electric modules, for example, which are wall-mountable. The

support preferably comprises insertion slots, to which the electric modules may be able to be connected. Preferably, the longitudinal side of the lower surface has dimensions which substantially correspond to a length of the slot of the support.

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In some embodiments, the covering device can be mounted on a structure which can be connected to a support for electric modules, for example, in order to cover an empty slot of the support. In this case, the device formed in this manner is configured as a "blank button".

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Preferably, the member of the covering device is made from rigid material. In this manner, the covering device may be securely fixed to the button of the electric module by means of the engagement system in such a manner that the pressing action produced by the user also causes the button below to
15 move, activating the switch, and at the same time the covering device moves together with the button during the tilting or axial movement thereof.

In the context of the present invention, it will be understood that the term "rigid" with reference to the material of the covering device is intended to
20 mean that it and in particular the member thereof is not subjected to significant deformations when a user acts with his/her finger on the surface thereof, that is to say, during the normal use of the module.

According to an aspect of the invention, the covering device is connected to
25 the button of the module so as to move together with the button.

Preferably, the covering device is made from polymer material.

This material is particularly advantageous in constructing the covering device,
30 allowing sufficient strength and sufficient rigidity for the purposes set out above.

Advantageously, the lower surface is substantially planar, for example, in the case of a button for a switch with axial control. This affords a plurality of

advantages, including: ease of printing, simplicity of mounting on the button and structural strength. In other embodiments, the lower surface may have a curvature. The curvature is advantageously formed in order to be able to be combined with a support surface of the button, to which the covering device
5 can be connected, the support surface in turn being formed with a similar curvature. The surfaces may have this curvature, preferably if the covering device can be connected to a button for a switch with tilting control.

Preferably, there are present four engagement elements. Advantageously,
10 these elements are positioned so as to be opposite in pairs with respect to the longitudinal plane which extends in the connection direction and along the longitudinal axis of the lower surface. Advantageously, a first pair of engagement elements is opposite and preferably symmetrical relative to a second pair of engagement elements with respect to the longitudinal plane.
15 Advantageously, a third pair of engagement elements is opposite and preferably symmetrical relative to a fourth pair of engagement elements with respect to a transverse plane which extends in the connection direction and along a transverse axis of the lower surface.

20 The longitudinal axis of the lower surface is advantageously equidistant from the longitudinal sides of the surface.

The transverse axis of the lower surface is advantageously equidistant from the transverse sides of the surface.

25 The lower surface of the member is preferably the surface which faces the module or the surface directed towards the module during the operation for mounting the covering device on the module.

30 The engagement elements have a specific degree of resilient deformability. The resilient deformations advantageously occur during the actions for mounting or dismounting the covering device on/from the module and are able to facilitate the operations for mounting or dismounting the covering device on/from the module. During the mounting, it is possible to deform the

engagement elements which will resiliently return to the initial position once mounting is carried out.

According to an aspect of the invention, each engagement element comprises
5 a support portion which extends from the lower surface in the connection direction and an engagement portion which is suitable for interfacing with a gripping portion of a respective connection element of the module.

The support portion is advantageously configured with a substantially
10 parallelogram-like shape. The engagement portion is preferably near an end of the support portion.

The support portion advantageously has a specific degree of resilient deformability which promotes the mounting and the dismounting of the
15 covering device on/from the module. Advantageously, during the connection between the covering device and the module, the support portion is subjected to resilient deformation which promotes the combination of the engagement portion with the respective connection element of the module. This allows a particularly stable connection to be obtained and at the same time facilitates
20 the operations for mounting and dismounting the covering device on/from the module.

The gripping portion which is present on each connection element of the module is formed so as to interface with the engagement portion of the
25 respective engagement element of the covering device, as will be described in greater detail below.

Preferably, a bevelled zone can be formed on at least one of the components of the frame. Advantageously, the bevelled zone is formed near the
30 longitudinal axis on at least one of the transverse components. Preferably, the bevelled zone is formed near the transverse axis on at least one of the longitudinal components. Advantageously, the bevelled zone may be present on both the transverse components or on both the longitudinal components or on each component of the frame. The bevelled zone may advantageously be

used to receive a tool, for example, the tip of a screwdriver, and to promote the removal of the electric module from a potential support, the electric module being combined with the covering device.

- 5 According to another aspect of the invention, the support portion is at least partially included in the frame.

Preferably, the support portion comprises a lower zone and an upper zone. Advantageously, the lower zone is at least partially included in the frame. In
10 some embodiments, the lower zone can partially project from the frame, advantageously in the transverse direction. Preferably, the upper zone projects from the frame, more preferably it projects in the connection direction. The support portion which is configured to be at least partially included in the frame is particularly advantageous in order to simplify the geometry of the
15 covering device and further increases the structural strength thereof.

Advantageously, the support portion is at least partially included in the longitudinal component of the frame. In other embodiments, the support portion is preferably at least partially included in the transverse component of
20 the frame.

In other embodiments, some engagement elements advantageously have the support portion at least partially included in the longitudinal component of the frame and other engagement elements have the support portion at least partially included in the transverse component of the frame.

25 Preferably, the engagement portion is configured as a first protrusion which extends from the support portion. The first protrusion of the engagement portion advantageously comprises a first surface which is suitable for coming into contact with a second surface of a respective connection element of the
30 module.

Preferably, the first protrusion extends perpendicularly to the support portion. Advantageously, the first surface is planar. Preferably, the first surface is

located in a plane which is substantially parallel with the plane defined by the longitudinal direction and the transverse direction of the covering device.

5 Preferably, the gripping portion of each connection element of the module is configured so as to have a second protrusion. The second protrusion advantageously extends in a substantially perpendicular manner to a support portion of the connection element of the module. The second protrusion includes the second surface which is suitable for moving into contact with the first surface of the engagement portion of the respective engagement element
10 of the covering device. Advantageously, the second surface is substantially planar. Preferably, the second surface is parallel with the support surface of the module. Advantageously, the first surface and the second surface are mutually parallel.

15 Once the mounting of the covering device on the module has been carried out, the first surface of the engagement portion of each engagement element will advantageously be in contact with the second surface of the gripping portion of the respective connection element of the module. The connection between the first surface and the second surface ensures a particularly stable
20 connection between the covering device and the module.

In some embodiments, the first protrusion of the engagement portion extends from the support portion towards the longitudinal plane.

25 In other words, the first protrusion of the engagement portion extends from the support portion in the direction towards the longitudinal axis of the lower surface.

In other embodiments, the first protrusion of the engagement portion extends
30 from the support portion and in an opposite direction with respect to the longitudinal plane. In other words, the first protrusion of the engagement portion extends from the support portion in the direction away from the longitudinal axis of the lower surface.

The second protrusion of the connection element of the module preferably extends in the opposite direction to the first protrusion of the respective engagement element of the covering device. Advantageously, if the first protrusion extends towards the longitudinal plane, the second protrusion
5 extends towards the exterior of the module. Advantageously, if the first protrusion extends in the opposite direction to the longitudinal plane, the second protrusion extends towards the interior of the module.

According to an embodiment of the invention, the engagement portion is
10 configured as an opening which is formed in the support portion.

Preferably, the opening has an access which is substantially parallel with the transverse direction. Advantageously, the opening is a through-opening, that is to say, it extends completely through the support portion. In other
15 embodiments, the opening is not a through-opening, that is to say, it extends partially into the support portion. Preferably, the opening may be in the form of a circle or an ellipse or may be of square form. Advantageously, the engagement elements of the covering device are configured with a slot-like shape. The engagement portion which is configured as an opening is
20 particularly suitable if the covering device is combined with a structure which can be connected to a support for electric modules. In this case, the device is configured as a "blank button" which may serve, for example, to cover an empty slot of the support for electric modules.

25 Preferably, at least one engagement element of the covering device comprises a first bevelled portion.

The first bevelled portion can advantageously be formed on the engagement portion, even more advantageously on the first protrusion. In some
30 embodiments, the first bevelled portion may preferably be formed on the support portion, even more preferably on the upper zone of the support portion.

The first bevelled portion is suitable for further promoting the connection between the engagement element and the respective connection element of the module. Preferably, the first bevelled portion interfaces with a second bevelled portion of the respective connection element of the module during the mounting of the covering device.

According to another aspect of the invention, the covering device comprises first shaped elements which are formed so as to be able to be combined with respective second shaped elements of the module.

The first shaped elements preferably comprise first insertion elements and first receiving elements; the second shaped elements preferably comprise second insertion elements and second receiving elements. The first insertion elements are advantageously formed in order to be combined with a positive-locking connection with respective second receiving elements. The first receiving elements are advantageously formed in order to be able to be combined with a positive-locking connection with respective second insertion elements.

Advantageously, the first shaped elements can be contained in the frame of the covering device.

In some embodiments, both the first insertion elements and the first receiving elements project from the frame in the connection direction. In this case, the receiving elements project to a lesser extent with respect to the insertion elements and are interposed between two insertion elements.

In other embodiments, the first insertion elements advantageously project from the frame in the connection direction and the receiving elements are advantageously configured as recesses which are formed in the frame.

In some embodiments, the first insertion elements can be partially contained in the support portion of the engagement elements.

The first insertion elements are advantageously configured as projections or protuberances, preferably with a substantially parallelepipedal form. The first receiving elements are advantageously configured as recesses or openings or housings, which are preferably square in shape. The second shaped elements
5 have a shape and dimensions which preferably complement the respective first shaped elements.

The shaped elements are particularly advantageous for improving the stability of the connection between the covering device and the module. The shaped
10 elements allow the mounting of the covering device to be made easier.

In some embodiments, the frame may comprise both the first shaped elements and, at least partially, the support portion.

15 According to another aspect of the invention, there is provided a device for electric installations comprising a covering device according the invention connected to a module for electric installations in such a manner that the lower surface of the covering device is directed towards a support surface of the module. The module comprises connection elements, each of which is
20 configured so as to be connectable to the respective engagement element of the covering device.

Advantageously, the module comprises a switch. Preferably, the module comprises a button to which the covering device is connected.

25 In some embodiments, the electric module can be connected to a support for electric modules. The support preferably comprises insertion slots to which the electric modules may be able to be connected. The electric module advantageously comprises a box-shaped member which can receive terminals
30 for electric wires and the actuation mechanism of the switch, for example, with tilting or axial control.

Preferably, the support surface of the module is in contact with the lower surface of the covering device once the device is connected to the button or in general.

5 Advantageously, the support surface has a shape and dimensions which are compatible with the lower surface of the covering device. Advantageously, the support surface is planar. In some embodiments, the support surface may have a curvature. The curvature may advantageously be similar to the curvature of the lower surface. If the lower surface is convex, the support
10 surface will be convex, and vice versa. Advantageously, the support surface comprises two transverse sides and two longitudinal sides. Preferably, the support surface has a square shape, even more preferably the shape is substantially rectangular.

15 Preferably, there are present four connection elements.

Advantageously, the connection elements are positioned so as to be aligned in pairs both in a longitudinal direction and in a transverse direction, defining between them a longitudinal distance and a transverse distance. The distances
20 substantially correspond to the distances defined between the engagement elements of the covering device. Advantageously, the longitudinal distance between the engagement elements of the covering device has approximately the same value as the longitudinal distance between the connection elements. Advantageously, the transverse distance between the engagement elements of
25 the covering device has approximately the same value as the transverse distance between the connection elements of the module.

Advantageously, a first pair of connection elements is opposite and preferably symmetrical relative to a second pair of connection elements with respect to a
30 plane which extends in the connection direction and along the longitudinal axis of the support surface.

Advantageously, a third pair of connection elements is opposite and preferably symmetrical relative to a fourth pair of connection elements with respect to a

plane which extends in the connection direction and along the transverse axis of the support surface.

5 The longitudinal axis of the support surface is advantageously equidistant from the longitudinal sides of the surface.

The transverse axis of the support surface is advantageously equidistant from the transverse sides of the surface.

10 The frame of the covering device is preferably wrapped around the support surface of the module when the covering device is connected to the module.

Preferably, the device for an electric installation comprises a shock-absorbing device interposed between the module and the covering device.

15 The shock-absorbing device is advantageously positioned on the support surface of the module. The shock-absorbing device preferably comprises a rectilinear portion which is interposed between two curved portions. The shock-absorbing device is preferably an elastomer material.

20 The shock-absorbing device is particularly advantageous for reducing the actuation noise if the module comprises a button, particularly in the case of a button for a switch with tilting control.

25 Additional features and additional advantages of the invention will be better appreciated from the following detailed description of a preferred though non-limiting embodiment which is illustrated by way of non-limiting example with reference to the appended drawings, in which:

30 Figure 1 is a perspective view of a covering device according to a first embodiment;

Figure 2 is a perspective view of a device for an electric installation according to a first embodiment;

Figure 3 is a cross-section of the device for an electric installation according to the first embodiment;

Figure 4 is a perspective view of the electric module, to which the covering device according to the first embodiment can be connected;

Figure 5 is a perspective view of a covering device according to a second embodiment;

5 Figure 6 is a perspective view of a device for an electric installation according to the second embodiment;

Figure 7 is a cross-section of the device for an electric installation according to the second embodiment;

10 Figure 8 is a perspective view of the electric module, to which the covering device according to the second embodiment can be connected;

Figure 9 is a perspective view of a covering device according to a third embodiment;

Figure 10 is a perspective view of a device for an electric installation according to the third embodiment;

15 Figure 11 is a cross-section of the device according to the third embodiment;

Figure 12 is a perspective view of the module, to which the covering device according to the third embodiment can be connected.

20 In a first embodiment with reference to Figures 1 to 4, a covering device which can be removably connected to a module 100 is generally designated 1.

As may be observed in Figure 2, reference will be made in the following description to the use of the covering device on a module 100 comprising a button 140, the button being shown more clearly in Figure 4. In any case, it
25 will be appreciated that the same inventive concepts can also be applied to other types of electric modules, such as sockets, sensors, ringers, etc.

However, a device for electric installations, for example, a button covering system, is generally designated 200. In the embodiment illustrated in the
30 Figures, the module 100 is connected to a switch with tilting control and can be connected to a support for electric modules which can be wall-mounted. The support may preferably comprise insertion slots to which the electric module 100 can be connected by means of hooks 144. The electric module 100 comprises a box-shaped member 142 which is illustrated in Figure 4 and

which can receive terminals for electric wires and the mechanism of the switch which is connected to the button 140.

Now with reference again to Figure 1, the covering device 1 comprises a member 10 and an engagement system 50.

The member 10 includes a lower surface 20 which has a substantially rectangular shape and which includes two transverse sides 15, 16 and two longitudinal sides 17, 18. In a Cartesian reference system XYZ which is associated with the covering device 1, the two transverse sides 15, 16 extend parallel with a transverse direction Y and the two longitudinal sides 17, 18 extend parallel with a longitudinal direction X. A connection direction Z is substantially perpendicular to the plane which is defined by the longitudinal direction X and the transverse direction Y.

A longitudinal axis D and a transverse axis T are defined on the lower surface 20. The longitudinal axis D of the lower surface 20 is equidistant from the longitudinal sides 17, 18 and the transverse axis T of the lower surface 20 is equidistant from the transverse sides 15, 16. The lower surface 20 is able to interface with a support surface 120 of the module 100, which can be seen in Figure 4.

The engagement system 50 includes four engagement elements 51, 52, 53, 54. The engagement elements are positioned so as to be aligned in pairs both in the longitudinal direction X and in the transverse direction Y, defining between them a longitudinal distance L and a transverse distance W.

A first pair of engagement elements 51, 52 is advantageously opposite and symmetrical relative to a second pair of engagement elements 53, 54 with respect to a longitudinal plane which extends in the connection direction Z and along the longitudinal axis D of the lower surface 20.

Advantageously, a third pair of engagement elements 52, 53 is opposite and symmetrical relative to a fourth pair of engagement elements 51, 54 with

respect to a transverse plane which extends in the connection direction Z and along the transverse axis T of the lower surface 20.

5 The member 10 advantageously comprises an external surface 98 having a printed pattern 99 which can display, for example, a function which is associated with the module 100, as illustrated, for example, in the embodiment illustrated in Figure 2.

10 Now with reference again to Figure 1, the member 10 comprises a frame 30 which projects from the lower surface 20. The frame 30 extends along the sides 15, 16, 17, 18 of the lower surface 20. The frame 30 includes two opposite longitudinal components 37, 38 and two opposite transverse components 35, 36. The frame 30 extends in the connection direction Z.

15 Each engagement element 51, 52, 53, 54 comprises an engagement portion 60 and a support portion 70.

20 The support portion 70 extends from the lower surface 20 in the connection direction Z. In some embodiments, the support portion 70 is substantially configured as a parallelogram.

25 The support portion 70 is partially contained in the longitudinal component 37, 38 of the frame 30. Preferably, the support portion 70 comprises a lower zone 72 and an upper zone 73. The lower zone 72 is advantageously contained in the longitudinal component 37, 38 of the frame 30; the upper zone 73 advantageously projects from the longitudinal component 37, 38 of the frame 30 in the connection direction Z and away from the lower surface 20.

30 The engagement portion 60 is substantially at one end 71 of the support portion 70.

The engagement portion 60 is formed so as to interface with a gripping portion 160 of a respective connection element 151, 152, 153, 154 of the button 140 or more generally of the module 100.

Preferably, the engagement portion is configured in such a manner that the covering device is directly engaged with the button 140.

5 The engagement portion 60 is configured as a first protrusion 80 which extends in a substantially perpendicular manner from the support portion 70. The first protrusion 80 of the engagement portion 60 advantageously comprises a first surface 61 which can come into contact with a second surface 161 of the respective connection element 151, 152, 153, 154 of the module
10 100, which can be seen in Figures 3 and 4.

The first surface 61 is substantially planar and is located in a plane which is substantially parallel with the plane defined by the longitudinal direction X and the transverse direction Y of the covering device 1.

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Still with reference to Figure 3, the gripping portion 160 of each connection element 151, 152, 153, 154 of the button 140 or, more generally, of the module 100 is preferably configured so as to have a second protrusion 180 which includes the second surface 161 and which is able to come into contact
20 with the first surface 61 of the engagement portion 60 of the respective engagement element 51, 52, 53, 54 of the covering device 1. Advantageously, the second surface 161 is substantially planar. Preferably, the second surface 161 is parallel with the first surface 61.

25 Still in Figure 3, it can be seen how, once the mounting of the covering device 1 on the module 100 has been carried out, the first surface 61 of the engagement portion 60 of the engagement element 53 is in contact with the second surface 161 of the gripping portion 160 of the respective connection element 153.

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The engagement portion 60 has a first bevelled portion 62 which can further promote the connection between the engagement element and the respective connection element of the module 100. The first bevelled portion 62 is advantageously formed on the first protrusion 80. The first bevelled portion 62

interfaces with a second bevelled portion 162 of the respective connection element of the module 100 during the mounting of the covering device 1 on the module 100.

5 The first protrusion 80 of the engagement portion 60 of each engagement element of the covering device 1 extends from the support portion towards the longitudinal plane. The second protrusion 180 of the gripping portion 160 of the connection element of the module 100 is orientated towards the interior of the module 100. In other words, the second protrusion 180 of the connection
10 element of the module 100 extends in the opposite direction to the first protrusion 80 of the respective engagement element of the covering device 1.

The covering device 1 comprises first shaped elements 90 which are formed so as to be able to be combined with respective second shaped elements 190 of
15 the button 140 or more generally of the module 100.

The first shaped elements 90 comprise first insertion elements 91 and first receiving elements 92; the second shaped elements 190 comprise second insertion elements 191 and second receiving elements 192.
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The first insertion elements 91 are formed so as to be able to be combined with a positive-locking connection with respective second receiving elements 192. The first receiving elements 92 are formed so as to be able to be combined with a positive-locking connection with respective second insertion
25 elements 191.

Figure 1 shows first insertion elements 91 which are configured as protuberances 93 which extend from the lower surface 20 and which are able to be inserted in second receiving elements 192 which are formed as openings
30 193 in the support surface of the button 140, which are visible in Figure 4, or more generally of the module 100.

Figure 1 further shows first insertion elements 91 which are partially contained in the longitudinal components 37, 38 of the frame 30 and which are formed

as projections 94 which extend from the frame 30 in the connection direction Z. Preferably, there are present three projections 94 for each longitudinal component 37, 38. The projections 94 are able to move into abutment against a second receiving element 192, which is illustrated in Figure 4 and which is
5 formed as a peripheral surface 194 of the module 100.

There are further present on the frame 30 first receiving elements 92 which also project from the longitudinal components 37, 38, but to a lesser extent with respect to the projections 94. Preferably, there are present two receiving
10 elements 92 for each longitudinal component 37, 38. Advantageously, each receiving element 92 is interposed between two projections 94. The first receiving elements 92 are formed so as to receive second insertion elements 191. The second insertion elements 191 are preferably formed as flaps 195 which project outwards.

15 The support surface 120 of the module 100 has a substantially rectangular shape and dimensions which are compatible with the lower surface 20 of the covering device 1. In some embodiments, the support surface 120 is defined on the button 140.

20 The support surface 120 has two transverse sides 115, 116, two longitudinal sides 117, 118, a longitudinal axis P and a transverse axis N. When the covering device 1 and the module 100 are connected, the lower surface 20 of the covering device 1 is directed towards the support surface 120.

25 The button 140, or more generally the module 100, comprises four connection elements 151, 152, 153, 154, each of which is configured so as to be able to be connected to the respective engagement element 51, 52, 53, 54 of the covering device 1.

30 The connection elements 151, 152, 153, 154 are positioned so as to define between them a longitudinal distance l and a transverse distance w. The distances l, w substantially correspond to the distances L, W which are defined between the engagement elements 51, 52, 53, 54 of the covering device 1.

A first pair of connection elements 151, 152 is opposite and preferably symmetrical relative to a second pair of engagement elements 154, 153 with respect to a plane which extends in the connection direction Z and along the longitudinal axis P of the support surface 120.

A third pair of connection elements 152, 153 is opposite and preferably symmetrical relative to a fourth pair of connection elements 151, 154 with respect to a plane which extends in the connection direction Z and along the transverse axis N of the support surface 120.

The longitudinal axis P of the support surface 120 is advantageously equidistant from the longitudinal sides 117, 118 of the surface 120.

The transverse axis N of the support surface 120 is advantageously equidistant from the transverse sides 115, 116 of the surface 120.

Each connection element 151, 152, 153, 154 of the module 100 comprises the support portion 170 and the gripping portion 160. The support portion 170 extends in a substantially perpendicular manner with respect to the support surface 120. The support surface 170 advantageously extends from the support surface 120 towards the box-shaped member 142. The gripping portion 160 is preferably located near an end 162 of the support portion 170.

The device 200 advantageously comprises a shock-absorbing device 40 which is interposed between the button 140 and the covering device 1. The shock-absorbing device 40 is advantageously positioned on the support surface 120. The shock-absorbing device 40 preferably comprises a rectilinear portion 41 which is interposed between two curved portions 42, 43. The shock-absorbing device is preferably an elastomer material.

In a second embodiment with reference to Figures 5 to 8, a covering device which can be removably connected to a module 500 is generally designated 400; however, a device for an electric installation is generally designated 600.

The covering device 1 comprises a member 410 and an engagement system 450. In preferred embodiments, the module 500 is connected to a switch with axial control which is associated with a respective button 540 and which can be connected to a support for electric modules. The support may preferably
5 comprise insertion slots, to which the electric module 500 can be connected by means of hooks 544. The electric module 500 comprises a box-shaped member 542 which can receive terminals for electric wires and the mechanism of the switch which is connected to the button 540.

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The member 410 includes a lower surface 420 which has a substantially rectangular shape and which includes two transverse sides 415, 416 and two longitudinal sides 417, 418. In a Cartesian reference system XYZ which is associated with the covering device 400, the two transverse sides 415, 416
15 extend parallel with a transverse direction Y and the two longitudinal sides 417, 418 extend parallel with a longitudinal direction X. A connection direction Z is substantially perpendicular to the plane which is defined by the longitudinal direction X and the transverse direction Y.

20 A longitudinal axis D' and a transverse axis T' are defined on the lower surface 420. The longitudinal axis D' of the lower surface 420 is equidistant from the longitudinal sides 417, 418 and the transverse axis T' of the lower surface 420 is equidistant from the transverse sides 415, 416. The lower surface 420 is able to interface with a support surface 520 of the button 540 which can be
25 seen in Figure 8.

The engagement system 450 includes four engagement elements 451, 452, 453, 454.

30 The engagement elements are positioned so as to be aligned in pairs both in the longitudinal direction X and in the transverse direction Y, defining between them a longitudinal distance L' and a transverse distance W'.

A first pair of engagement elements 451, 452 is advantageously opposite and symmetrical relative to a second pair of engagement elements 454, 453 with respect to a longitudinal plane which extends in the connection direction Z and along the longitudinal axis D' of the lower surface 420.

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Advantageously, a third pair of engagement elements 452, 453 is opposite and symmetrical relative to a fourth pair of engagement elements 451, 454 with respect to a transverse plane which extends in the connection direction Z and along the transverse axis T' of the lower surface 420.

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The member 410 comprises a frame 430 which projects from the lower surface 420. The frame 430 extends along the sides 415, 416, 417, 418 of the lower surface 420. The frame 430 includes two opposite longitudinal components 437, 438 and two opposite transverse components 435, 436. The frame 430 extends in the connection direction Z.

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Each engagement element 451, 452, 453, 454 comprises an engagement portion 460 and a support portion 470.

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The support portion 470 extends from the lower surface 420 in the connection direction Z. The support portion 470 is configured with a substantially parallelogram-like shape.

The engagement portion 460 is substantially near an end 471 of the support portion 470.

25

The engagement portion 460 is formed so as to interface with a gripping portion 560 of a respective connection element 551, 552, 553, 554 of the button 540.

30

It will be appreciated that reference will be made below to an embodiment in which the covering device is fixed to the button 540 of the module 500. If the covering device were to be used in modules of a different type, however, it

may be fixed to other portions of the module 500, similarly to what is set out in the preceding embodiment.

5 The engagement portion 460 is configured as a first protrusion 480 which extends in a substantially perpendicular manner from the support portion 470. The first protrusion 480 of the engagement portion 460 advantageously comprises a first surface 461 which can come into contact with a second surface 561 of the respective connection element 551, 552, 553, 554 of the button 540.

10

The first surface 461 is substantially planar and is located in a plane which is substantially parallel with the plane defined by the longitudinal direction X and the transverse direction Y of the covering device 400.

15 Preferably, the gripping portion 560 of each connection element 551, 552, 553, 554 of the button 540 is configured so as to have a second protrusion 580 which includes the second surface 561 which can come into contact with the first surface 461 of the engagement portion 460 of the respective engagement element 451, 452, 453, 454 of the covering device 400. Advantageously, the
20 the second surface 561 is substantially planar. Preferably, the second surface 561 is parallel with the first surface 461.

Figure 7 shows how, once the mounting of the covering device 400 on the button 540 has been carried out, the first surface 461 of the engagement
25 portion 460 of the engagement element 453 is in contact with the second surface 561 of the gripping portion 560 of the respective connection element 553 of the button 540.

The engagement portion 460 has a first bevelled portion 462 which can further
30 promote the connection between the engagement element and the respective connection element of the button 540. The first bevelled portion 462 is advantageously formed on the first protrusion 480. The first bevelled portion 462 interfaces with a second bevelled portion 562 of the respective connection

element of the button 540 during the mounting of the covering device 400 on the button 540.

5 The first protrusion 480 of the engagement portion 460 of each engagement element of the covering device 400 extends from the support portion 470 in the opposite direction to the longitudinal plane. The second protrusion 580 of the gripping portion 560 of the connection element of the button 540 is orientated towards the interior of the button 540. In other words, the second protrusion 580 of the connection element of the button 540 extends in the
10 opposite direction to the first protrusion 480 of the respective engagement element of the covering device 400.

The covering device 400 comprises first shaped elements 490 which are formed so as to be able to be combined with respective second shaped
15 elements 590 of the button 540.

The first shaped elements 490 comprise first insertion elements 491; the second shaped elements 590 comprise second receiving elements 592.

20 Figure 5 shows a first insertion element 491 which is partially contained in the frame 430. In particular, the first insertion element 491 is configured as a protuberance 494 which extends from the longitudinal component 437 of the frame 430 in the connection direction Z. The protuberance 494 is formed so as to be able to be inserted in a second receiving element 592 which is formed as
25 a channel 594 which is obtained at the longitudinal side 518 of the support surface 520 of the button 540, which can be seen in Figure 8. In particular, the channel 594 is constructed near the transverse axis N' of the support surface 520.

30 Figure 5 further shows first insertion elements 491 which are configured as projections 493 which extend from the lower surface 420. The projections 493 are preferably partially contained in the support portion 470 of the engagement elements. The projections 493 are formed so as to be able to be inserted in second receiving elements 592 which are formed as openings 593

in the support surface of the module, which can be seen in Figure 8. Preferably, the openings 593 are able to receive the engagement elements of the covering device 400.

5 The support surface 520 of the button 540 has a substantially rectangular shape and dimensions which are compatible with the lower surface 420 of the covering device 400. The support surface 520 has two transverse sides 515, 516, two longitudinal sides 517, 518, a longitudinal axis P' and a transverse axis N' . When the covering device 400 and the button 540 are connected, the
10 lower surface 420 of the covering device 400 is directed towards the support surface 520.

The button 540 comprises four connection elements 551, 552, 553, 554, each of which is configured so as to be able to be connected to the respective
15 engagement element 451, 452, 453, 454 of the covering device 400.

The connection elements 551, 552, 553, 554 are positioned so as to define between them a longitudinal distance l' and a transverse distance w' . The distances l' , w' substantially correspond to the distances L' , W' which are
20 defined between the engagement elements 451, 452, 453, 454 of the covering device 400.

A first pair of connection elements 551, 552 is opposite and preferably symmetrical relative to a second pair of connection elements 554, 553 with
25 respect to a plane which extends in the connection direction Z and along the longitudinal axis P' of the support surface 520.

A third pair of connection elements 552, 553 is opposite and preferably symmetrical relative to a fourth pair of connection elements 551, 554 with
30 respect to a plane which extends in the connection direction Z and along the transverse axis N' of the support surface 520.

The longitudinal axis P' of the support surface 520 is advantageously equidistant from the longitudinal sides 517, 518 of the surface 520.

The transverse axis N' of the support surface 520 is advantageously equidistant from the transverse sides 515, 516 of the surface 520.

5 The connection elements 551, 552, 553, 554 of the button 540 are advantageously positioned in the region of openings 593 which can receive the respective engagement elements of the covering device 400. Each opening 593 is preferably formed so as to receive both the first shaped elements 491, which are formed as projections 493, and the engagement elements of the
10 covering device 400.

Each connection element 551, 552, 553, 554 of the button 540 comprises the support portion 570 and the gripping portion 560. The support portion 570 extends in a substantially perpendicular manner with respect to the support
15 surface 520. The support portion 570 advantageously extends from the support surface 520 towards the box-shaped member 542. The gripping portion 560 is preferably located near an end 562 of the support portion 570.

In a third embodiment with reference to Figures 9 to 12, a device for electric
20 installations which is configured as a "blank button" is generally designated 900. In this case, the device also comprises a module 800 for electric installations which can be connected to a support for electric modules which can be wall-mounted. The device 900 comprises a covering device 700 which can be removably connected to a module 800. In this embodiment, the
25 module 800 is formed as a structure 842 which is not connected to a switch. The structure 842 can be connected to a support for electric modules. The support may preferably comprise insertion slots to which the structure 842 may be able to be connected by means of hooks 844.

30 The covering device 700 comprises a member 710 and an engagement system 750.

The member 710 includes a lower surface 720 which has a substantially rectangular shape and which includes two transverse sides 715, 416 and two

longitudinal sides 717, 718. In a Cartesian reference system XYZ which is associated with the covering device 700, the two transverse sides 715, 716 extend parallel with a transverse direction Y and the two longitudinal sides 717, 718 extend parallel with a longitudinal direction X. A connection direction Z is substantially perpendicular to the plane which is defined by the longitudinal direction X and the transverse direction Y.

A longitudinal axis D'' and a transverse axis T'' are defined on the lower surface 720. The longitudinal axis D'' of the lower surface 720 is equidistant from the longitudinal sides 717, 718 and the transverse axis T'' of the lower surface 720 is equidistant from the transverse sides 715, 716. The lower surface 720 is able to interface with a support surface 820 of the module 800, which can be seen in Figure 12.

The engagement system 750 includes four engagement elements 751, 752, 753, 754. The engagement elements are positioned so as to be aligned in pairs both in the longitudinal direction X and in the transverse direction Y, defining between them a longitudinal distance L'' and a transverse distance W''.

A first pair of engagement elements 751, 752 is advantageously opposite and symmetrical relative to a second pair of engagement elements 753, 754 with respect to a longitudinal plane which extends in the connection direction Z and along the longitudinal axis D'' of the lower surface 720.

Advantageously, a third pair of engagement elements 752, 753 is opposite and symmetrical relative to a fourth pair of engagement elements 751, 754 with respect to a transverse plane which extends in the connection direction Z and along the transverse axis T'' of the lower surface 720.

The member 710 comprises a frame 730 which projects from the lower surface 720.

The frame 730 extends along the sides 715, 716, 717, 718 of the lower surface 720. The frame 730 includes two opposite longitudinal components

737, 738 and two opposite transverse components 735, 736. The frame 730 extends in the connection direction Z.

Both the transverse components 735, 736 have a bevelled zone 781 which is
5 formed near the longitudinal axis D'' on each of the components 735, 736.

Each engagement element 751, 752, 753, 754 comprises an engagement portion 760 and a support portion 770.

10 The support portion 770 is partially contained in the longitudinal component 737, 738 of the frame 730. In particular, a lower zone 772 of the support portion 770 is partially contained in the longitudinal component 737, 738 of the frame 730 while an upper zone 773 of the support portion 770 projects from the longitudinal component 737, 738 of the frame 730. Preferably, the
15 lower zone 772 projects from the longitudinal component 37, 38 in the transverse direction Y and towards the interior of the covering device 700. Advantageously, the upper zone 773 has connectors.

The engagement portion 760 is formed so as to interface with a gripping
20 portion 860 of a respective connection element 851, 852, 853, 854 of the module 800. The engagement portion 760 is configured as an opening 761 which is formed on the support portion 770 and which has an axis 764 which is substantially parallel with the transverse direction Y. The opening 761 is preferably a through-opening or extends completely through the support
25 portion 770. The engagement elements 751, 752, 753, 754 of the covering device 700 are configured with a slot-like shape. The opening 761 is formed as an ellipse.

Figure 11 shows how, once the mounting of the covering device 700 on the
30 module 800 has been carried out, the engagement portion 760 of the engagement element 753 which is in the form of an opening 761 receives the gripping portion 860 of the respective connection element 853 of the module 800.

The engagement portion 760 of the engagement element 753 has a first bevelled portion 762 which can further promote the connection between the engagement element and the respective connection element of the module 800. The first bevelled portion 762 is advantageously formed on the upper zone 773 of the support portion 770. The first bevelled portion 762 interfaces with a second bevelled portion 864 of the respective connection element of the module 800 during the mounting of the covering device 700 on the module 800. The covering device 700 comprises first shaped elements 790 which are formed so as to be able to be combined with respective second shaped elements 890 of the module 800.

The first shaped elements 790 comprise first insertion elements 791; the second shaped elements 890 comprise second receiving elements 892.

Figure 9 shows a first insertion element 791 which is partially contained in the frame 730. In particular, the first insertion element 791 is configured as a protuberance 794 which extends from the lower surface 720 in the connection direction Z. The protuberance 794 is formed so as to be able to be inserted in a second receiving element 892 which is formed as a receiving member 894 which is obtained near the longitudinal sides 817, 818 of the support surface 820 of the module 800, which can be seen in Figure 12. In particular, the receiving member 894 is constructed near the transverse axis N'' of the support surface 820. Preferably, the receiving member 894 is interposed between a pair of projections 895 which extend from the support surface 820. The projections 895 preferably have a bevel which can guide the insertion of the protuberance 794 in the receiving member 894.

The support surface 820 of the module 800 has a substantially rectangular shape and dimensions which are compatible with the lower surface 720 of the covering device 700. The support surface 820 has two transverse sides 815, 816, two longitudinal sides 817, 818, a longitudinal axis P'' and a transverse axis N''. When the covering device 700 and the module 800 are connected, the lower surface 720 of the covering device 700 is directed towards the support surface 820 of the module 800.

The module 800 comprises four connection elements 851, 852, 853, 854, each of which is configured so as to be able to be connected to the respective engagement element 751, 752, 753, 754 of the covering device 700.

5

The connection elements 851, 852, 853, 854 are positioned so as to define between them a longitudinal distance l'' and a transverse distance w'' . The distances l'' , w'' substantially correspond to the distances L'' , W'' which are defined between the engagement elements 751, 752, 753, 754 of the covering device 700.

10

A first pair of connection elements 851, 852 is opposite and preferably symmetrical relative to a second pair of connection elements 854, 853 with respect to a plane which extends in the connection direction Z and along the longitudinal axis P'' of the support surface 820.

15

A third pair of connection elements 852, 853 is opposite and preferably symmetrical relative to a fourth pair of connection elements 851, 854 with respect to a plane which extends in the connection direction Z and along the transverse axis N'' of the support surface 820.

20

The longitudinal axis P'' of the support surface 820 is advantageously equidistant from the longitudinal sides 817, 818 of the surface 820.

The transverse axis N'' of the support surface 820 is advantageously equidistant from the transverse sides 815, 816 of the surface 820.

25

Each connection element 851, 852, 853, 854 of the module 800 comprises a support portion 870 and the gripping portion 860. The support portion 870 extends in a substantially perpendicular manner with respect to the support surface 820. The gripping portion 860 is located at the longitudinal sides 817, 818. The gripping portion 860 is configured as a second protrusion 880 which extends in a substantially perpendicular manner with respect to the support portion 870 and away from the longitudinal axis P'' of the support surface 820.

30

The invention thereby solves the problem proposed, at the same time affording a plurality of advantages. In particular, the covering device is particularly versatile and can readily be removably connected to a button, at
5 the same time providing a particularly stable engagement system which withstands the mechanical loads which occur during the operations for mounting and dismounting the covering device on/from the button.

Claims

1. A covering device (1; 400; 700) which can be removably connected to a module (100; 500; 800) for an electric installation, the module being able to be wall-mounted, the covering device (1; 400; 700) comprising a member (10; 410; 710) and an engagement system (50; 450; 750),
the member (10; 410; 710) including a lower surface (20; 420; 720) which is suitable for interfacing with the module (100; 500; 800) and comprising two transverse sides (15, 16; 415, 416; 715, 716) and two longitudinal sides (17, 18; 417, 418; 717, 718), and a frame (30; 430; 730) which extends from the lower surface (20; 420; 720) in a connection direction (Z) and which extends along the sides (15, 16, 17, 18; 415, 416, 417, 418; 715, 716, 717, 718) of the lower surface (20; 420; 720), the frame (30; 430; 730) including two opposite longitudinal components (37, 38; 437, 438; 737, 738) and two opposite transverse components (35, 36; 435, 436; 735, 736),
the engagement system (50; 450; 750) including engagement elements (51, 52, 53, 54; 451, 452, 453, 454; 751, 752, 753, 754) which are positioned near the longitudinal sides (17, 18; 417, 418; 717, 718) of the lower surface (20; 420; 720) so as to be opposite in pairs with respect to a longitudinal plane, the longitudinal plane extending in the connection direction (Z) and along a longitudinal axis (D; D'; D'') of the lower surface (20; 420; 720), each engagement element (51, 52, 53, 54; 451, 452, 453, 454; 751, 752, 753, 754) being resiliently deformable and formed to allow the connection with a respective connection element (152, 153, 154, 155; 551, 552, 553, 554; 851, 852, 853, 854) of the module (100; 500; 800).

2. A covering device (1; 400; 700) according to the preceding claim, wherein each engagement element (51, 52, 53, 54; 451, 452, 453, 454; 751, 752, 753, 754) comprises:
a support portion (70; 470; 770) which extends from the lower surface (20; 420; 720) in the connection direction (Z) and
an engagement portion (60; 460; 760) which is suitable for interfacing with a gripping portion (160; 560) of a respective connection element (152, 153, 154, 155; 551, 552, 553, 554; 851, 852, 853, 854) of the module (100; 500; 800).

3. A covering device (1; 700) according to the preceding claim, wherein the support portion (70; 770) is at least partially included in the frame (30; 730).

5 4. A covering device (1; 400) according to claim 2 or 3, wherein the engagement portion (60; 460) is configured as a first protrusion (80; 480) which extends from the support portion (70; 470) and which comprises a first surface (61; 461) which is suitable for coming into contact with a second surface (161; 561) of a respective connection element of the module (100; 500).

10 5. A covering device (1) according to the preceding claim, wherein the first protrusion (80) of the engagement portion (60) extends from the support portion (70) towards the longitudinal plane.

15 6. A covering device (400) according to claim 4, wherein the first protrusion (480) of the engagement portion (460) extends from the support portion (470) and in an opposite direction with respect to the longitudinal plane.

20 7. A covering device (700) according to claim 2 or 3, wherein the engagement portion (760) is configured as an opening (761) which is formed in the support portion (770).

25 8. A covering device (1; 400; 700) according to any one of the preceding claims, wherein at least one engagement element (51, 52, 53, 54; 451, 452, 453, 454; 751, 752, 753, 754) comprises a first bevelled portion (62; 462; 762).

30 9. A covering device (1; 400; 700) according to any one of the preceding claims, wherein the module (100; 500; 800) comprises a button (140; 540).

10. A covering device (1; 400; 700) according to any one of the preceding claims, wherein the member (10; 410; 710) is made from rigid material.

11. A covering device (1; 400; 700) according to any one of the preceding claims, wherein the covering device is made from a polymer material.

12. A device (200; 600; 900) for an electric installation comprising a covering
5 device (1; 400; 700) according to any one of the preceding claims connected to a module (100; 500; 800) in such a manner that the lower surface (20; 420; 720) of the covering device (1; 400; 700) is directed towards a support surface (120; 520; 820) of the module (100; 500; 800), the module (100; 500; 800) comprising connection elements (152, 153, 154, 155; 551, 552,
10 553, 554; 851, 852, 853, 854), each of which being configured so as to be connectable to the respective engagement element (51, 52, 53, 54; 451, 452, 453, 454; 751, 752, 753, 754) of the covering device (1; 400; 700).

13. A device (200; 600; 900) for an electric installation according to the
15 preceding claim, comprising a shock-absorbing device (40) interposed between the module (100) and the covering device (1).

14. A device (200; 600; 900) for an electric installation according to claim 12
20 or 13, wherein the covering device (1) is directly fixed to the module (100; 500; 800).

15. A device (200; 600; 900) for an electric installation according to any one
of claims 12 to 14, wherein the module (100; 500; 800) comprises a button
(140; 540).

25 16. A device (200; 600; 900) for an electric installation according to claim 15, wherein the covering device (1; 400; 700) is directly connected to the button (140; 540).

30 17. A device (200; 600; 900) for an electric installation according to claim 15 or 16, wherein the module (100; 500; 800) comprises a switch which is actuated by the button (140; 540).

18. A device (200; 600; 900) for an electric installation according to any one of claims 12 to 17, wherein the module (100; 500; 800) can be connected to a support for electric modules, the support preferably comprising insertion slots for connecting the module (100; 500; 800) by means of hooks.

5

19. A device (200; 600; 900) for an electric installation according to any one of claims 12 to 18, wherein the module (100; 500) comprises a box-shaped member (142; 152) which can receive terminals for electric wires and a mechanism of the switch.

10

20. A device (200; 600; 900) for an electric installation according to any one of claims 12 to 14 when dependent on claim 15, wherein the covering device is connected to the button so as to move together with the button.

15