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ELECTRIC STRIKER UNIT

(57)

An electric striker unit (2) configured to be mounted in a door frame (4) such that it cooperates with a lock assembly (6) mounted at a door leaf (8). The electric striker unit (2) comprises a striker unit housing (10) having a shape of an elongated cuboid and comprises six rectangular housing walls (12). The electric striker unit (2) comprises a first electrical connector (14) of a first type is provided in one of said housing walls (12) structured to receive a mating electrical cable contact member (16) for supplying electrical energy to, and communicating with, the electric striker unit (2). The electric striker unit (2) comprises a second electrical connector (18) of a second type structured to receive a mating electrical cable contact member (16) for supplying electrical energy to, and communicating with, the electric striker unit, and that said first type is different from said second type, and wherein the second electrical connector (18) is arranged in a housing wall (12) which is different from the housing wall (12) where the first electrical connector (14) is arranged.

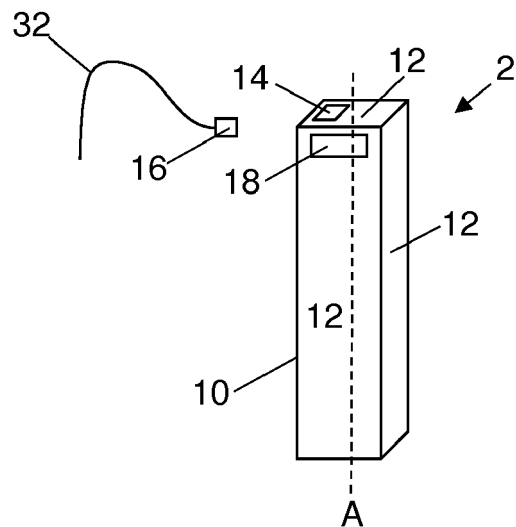


FIG. 2

Description

Technical field

[0001] The present disclosure relates to an electric striker unit configured to be arranged in a door frame and to cooperate with a locking assembly arranged at a door leaf.

Background

[0002] Electric striker units are used in various entrance solutions, e.g. where door opening should be remotely controlled.

Conventionally, an electric striker unit comprises a housing enclosing the various parts of the unit. To open a closed door the striker unit is configured to be remotely controlled by e.g. pressing an open button.

In a commonly used striker a pivot latch is provided in the striker unit. The pivot latch is pivotable between a "lock latch blocking position", (locked position) and a "lock latch release position" (open position) when the pivot latch is pivoted into the housing. In the open position the pivot latch allows the locking assembly to be released and thus allows the door to be opened.

The movement of the pivot latch is normally electromagnetically controlled by an electromechanical unit provided in the electric striker unit housing.

Often the pivot latch is indirectly moved by the electromechanical unit via a first arm and a second arm. The purpose of the first arm is to secure that the second arm is in its locked position where the pivot latch is in its locked position. The first arm can be moved, by the electromechanical unit, between a locked state and a released state.

[0003] Thus, in order to function properly the electric striker unit must be supplied with electrical energy to energize various component within the unit, and also be configured to receive various control signals to control the electrical components within the unit. Therefore, an electrical cable must be connected to the striker unit for supplying energy and control signals to the unit. The conductors of the electrical cable is often connected to the striker unit via a screw connector.

[0004] In the following some documents will be briefly discussed that disclose various prior art devices and in particular electrical connectors applied in electric striker units.

[0005] ES2651448 shows an electric strike with two electrical connectors at two opposite sides of the strike housing to allow installation of the product without having to make adjustments to it. The figures suggest that they are screw-block terminals.

[0006] DE102016113415 shows an electric door opening device whose power supply connector can be a spring-loaded plug type or a screwed clamp type.

[0007] When installing an electric striker unit in a door frame, there is often limited available space and thereby

it is sometimes difficult to connect the electrical cable to the electric striker unit in order to power the electric striker. As mentioned above the electrical connection terminal at the electric striker unit is e.g. provided with screws, which is a conventional type of electrical supply connection.

[0008] The object of the present invention is to achieve an improved electric striker unit. The improvement lies in that it is easier to install in comparison to the presently used striker units, in that electrical connection to the striker unit may be achieved even if limited space is available around the striker unit. A further improvement is that various types of electrical contact members may be applied.

Summary

[0009] The above-mentioned object is achieved by the present invention according to the independent claim.

[0010] Preferred embodiments are set forth in the dependent claims.

[0011] Thus, according to an aspect of the present invention an electric striker unit is provided which is configured to be mounted in a door frame such that it cooperates with a lock assembly mounted at a door leaf. The electric striker unit comprises a striker unit housing having a shape of an elongated cuboid and comprises six rectangular housing walls defining an inner space of the striker unit where various members and parts of the striker unit are enclosed. The electric striker unit comprises a first electrical connector of a first type that is provided in one of said housing walls and structured to receive a mating electrical cable contact member for supplying electrical energy to, and communicating with, the electric striker unit. Furthermore, the electric striker unit comprises a second electrical connector of a second type structured to receive a mating electrical cable contact member for supplying electric energy to, and communicating with, the electric striker unit, and that said first type is different from said second type. The second electrical connector is arranged in a housing wall which is different from the housing wall where the first electrical connector is arranged, and wherein the striker unit is configured to receive electrical energy from, and to communicate via, the electrical connector where an electrical cable contact member is received.

[0012] In one embodiment the housing walls comprise two short end walls arranged at the short ends of the striker unit housing, and four side walls running along a longitudinal axis A of the housing and that one of the first and second electrical connectors is arranged in one of the short end walls, and the other of the first and second electrical connectors is arranged in one of the side walls. Thereby, easy access to at least one of the electrical connectors is achieved in many installation situations.

In a particular embodiment the first electrical connector is arranged in one of the short end walls of the housing, and second electrical connector is arranged in one of the side walls at a position in the half of the side wall, in the

longitudinal direction of the striker unit, that faces the short end wall where the first electrical connector is arranged.

And in still another embodiment the first and second electrical connectors are arranged close to each other and at different housing walls, such that electrical lines within the housing from the respective connectors essentially may follow the same path, which is advantageous, in particular from a manufacturing point of view.

[0013] In another embodiment the electric striker unit comprises a control member, a detector member and a switching member, and that the detector member is configured to detect and determine which electrical connector that has received an electrical cable contact member. The control member is configured to control the switching member to connect electrical lines of the striker unit to that electrical connector in dependence of the result of the detection of the detector member. This secures a safe functionality of the electric striker unit in that the non-used electrical connector is disconnected from the electrical lines.

[0014] Thus, one essential feature of the electrical striker unit disclosed herein is that two different types of electrical connectors are provided at the electric striker unit housing, and specifically that the two different types are arranged at different walls of the housing such that mounting and electrical connection to the electric striker unit is facilitated even if it is to be mounted in narrow spaces. In addition is obtained a more general installation in that it is possible to connect different types of cable connectors to the electric striker unit.

Brief description of the drawings

[0015]

Figure 1 is a schematic overview illustration of a door frame where the electric striker unit is installed.

Figure 2 is a schematic illustration of an electric striker unit according to the present invention.

Figure 3 is a schematic block diagram illustrating an electric striker unit according to one embodiment of the present invention.

Figure 4 show schematic perspective views of an electric striker unit according to another embodiment of the present invention.

Detailed description

[0016] The electric striker unit will now be described in detail with references to the appended figures. Throughout the figures the same, or similar, items have the same reference signs. Moreover, the items and the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention.

[0017] With references to the schematic overview illustration of figure 1 one typical installation of an electric striker unit is shown. Herein an electric striker unit 2 is

provided configured to be mounted in a door frame 4 such that it cooperates with a lock assembly 6 mounted at a door leaf 8.

[0018] In the schematic illustration in figure 2 it is shown that the electric striker unit 2 comprises a striker unit housing 10 having a shape of an elongated cuboid and comprises six rectangular housing walls 12 defining an inner space of the striker unit where various members and parts of the striker unit are enclosed. As mentioned above in the background section these various members and parts may comprise a pivotable latch 34 (see figure 4), and various mechanical members, e.g. arms, springs and rods, and electrical components, e.g. electromagnets and solenoids. These members and parts will not be further described herein unless they are directly related for using the striker unit disclosed in the present application.

[0019] The electric striker unit 2 comprises a first electrical connector 14 of a first type which is provided in one of the housing walls 12 and structured to receive a mating electrical cable contact member 16 for supplying electrical energy to, and communicating with, the electric striker unit 2. The contact member is attached to an electrical cable 32.

[0020] Furthermore, the electric striker unit 2 comprises a second electrical connector 18 of a second type structured to receive a mating electrical cable contact member 16 for supplying electrical energy to, and communicating with, the electric striker unit. The first type of electrical connector 14 is different from the second type of electrical connector 18, and that the second electrical connector 18 is arranged in a housing wall 12 which is different from the housing wall 12 where the first electrical connector 14 is arranged. During operation the striker unit 2 is configured to receive electrical energy from, and to communicate via, the electrical connector 14, 18 where an electrical cable contact member 16 is received.

[0021] In one embodiment, the housing walls 12 comprise two short end walls 20 (see figure 4) arranged at the short ends of the striker unit housing 10, and four side walls 22 (see figure 4) running along a longitudinal axis A of the housing 10. One of the first and second electrical connectors 14, 18 is arranged in one of said short end walls 20, and the other of the first and second electrical connectors 14, 18 is arranged in one of said side walls 22.

[0022] In a further embodiment the first electrical connector 14 is arranged in one of the short end walls 20 of the housing, and the second electrical connector 18 is arranged in one of the side walls 22 at a position in the half of the side wall 22, in the longitudinal direction of the striker unit, that faces the short end wall 20 where the first electrical connector 14 is arranged, and more preferably the second electrical connector 18 is arranged in one of the side walls 22 at a position in the third or quarter of the side wall 22, in the longitudinal direction of the striker unit, that faces the short end wall 20 where the first electrical connector 14 is arranged. It is advanta-

geous to arrange the different connectors close to each other in that electrical lines 24 within the housing 10 from the two connectors then may follow essentially the same path, which makes the construction less complex which in turn lowers the production cost.

In a more general embodiment the first and second electrical connectors 14, 18 are arranged close to each other and at different housing walls 12, such that electrical lines 24 within the housing 10 from the respective connectors essentially may follow the same path. By close may in this context be interpreted as a distance that is less than the maximal width of the short end wall, e.g. within the range of 1-4 cm.

[0023] In still another embodiment, illustrated by the schematic block diagram shown in figure 3, the electric striker unit 2 comprises a control member 26, a detector member 28 and a switching member 30. The detector member 28 is configured to detect and determine which electrical connector 14, 18 that has received an electrical cable contact member 16, and that the control member 26 is configured to control the switching member 30 to connect electrical lines 24 of the striker unit to that electrical connector 14, 18 in dependence of the result of the detection of the detector member 28.

The detector member 28 may comprise a circuitry capable of detecting a supply voltage at the electrical connector. This will result in that the switching member is set in a position where both supplied energy and control signals from the identified connector are routed to the relevant members and parts within the striker unit.

In a more simple implementation the electrical lines 24 of both electrical connectors 14, 18 are connected to the members and parts of the striker unit.

[0024] According to one embodiment one of the first type and second type is a screw type connector, and the other is a female plug-in connector.

In a screw type connector each thread of the electrical cable is firmly attached to the electrical connector by a screw, or any equivalent mean.

A female plug-in connector cooperates with a mating male plug-in contact member. This type of connector and contact member pair may often only be put together in one way which eliminates the risk of erroneous installation and also makes the installation easy to perform.

[0025] Naturally, various types of electrical connectors may be applied. In the above embodiment two distinct types have been discussed but it should be noted that any type of connectors are applicable to the electric striker unit within the scope of the appended patent claims.

[0026] Figure 4 illustrates a perspective view of the electric striker unit 2; the upper part of the figure shows the striker unit when the contact member 16 is connected to the striker unit, in the figure the contact member 16 is received by the first electrical connector 14. In the lower part of the figure the contact member 16 is not connected to the striker unit 2. As known by the skilled person in the field of electric strikers, the enclosing wall may be regarded as essentially rectangular. However, there may be

one or many openings of various sizes in the walls, e.g. where the pivotable latch is arranged. The housing may also be provided with means for attaching and securing the electric striker to the door frame.

[0027] In a further variation of the electric striker unit one or many additional electrical connectors are provided at the striker unit, in addition to the first and second electrical connectors 14, 18. The added connector(s) may be of the same type as any of the first and second types, but may also be of other types.

[0028] The present invention is not limited to the above-described preferred embodiments. Various alternatives, modifications and equivalents may be used. Therefore, the above embodiments should not be taken as limiting the scope of the invention, which is defined by the appending claims.

Claims

1. An electric striker unit (2) configured to be mounted in a door frame (4) such that it cooperates with a lock assembly (6) mounted at a door leaf (8), the electric striker unit (2) comprises a striker unit housing (10) having a shape of an elongated cuboid and comprises six rectangular housing walls (12) defining an inner space of the striker unit where various members and parts of the striker unit are enclosed, the electric striker unit (2) comprises a first electrical connector (14) of a first type which is provided in one of said housing walls (12) and structured to receive a mating electrical cable contact member (16) for supplying electrical energy to, and communicating with, the electric striker unit (2), **characterized in that** said electric striker unit (2) comprises a second electrical connector (18) of a second type structured to receive a mating electrical cable contact member (16) for supplying electrical energy to, and communicating with, the electric striker unit, and that said first type is different from said second type, and wherein the second electrical connector (18) is arranged in a housing wall (12) which is different from the housing wall (12) where the first electrical connector (14) is arranged, and wherein said striker unit (2) is configured to receive electrical energy from, and to communicate via, the electrical connector (14, 18) where an electrical cable contact member (16) is received.
2. The electric striker unit (2) according to claim 1, wherein said housing walls (12) comprise two short end walls (20) arranged at the short ends of the striker unit housing (10), and four side walls (22) running along a longitudinal axis A of said housing (10), and wherein one of the first and second electrical connectors (14, 18) is arranged in one of said short end walls (20), and the other of the first and second electrical connectors (14, 18) is arranged in one of said side walls (22).

3. The electric striker unit (2) according to claim 2, wherein said first electrical connector (14) is arranged in one of the short end walls (20) of the housing, and said second electrical connector (18) is arranged in one of the side walls (22) at a position in the half of the side wall (22), in the longitudinal direction of the striker unit, that faces the short end wall (20) where the first electrical connector (14) is arranged.
4. The electric striker unit (2) according to any of claims 1-3, wherein said first and second electrical connectors (14, 18) are arranged close to each other and at different housing walls (12), such that electrical lines (24) within the housing (10) from the respective connectors essentially may follow the same path.
5. The electric striker unit (2) according to any of claims 1-4, comprising a control member (26), a detector member (28) and a switching member (30), wherein said detector member (28) is configured to detect and determine which electrical connector (14, 18) that has received an electrical cable contact member (16), and wherein the control member (26) is configured to control said switching member (30) to connect electrical lines of the striker unit to that electrical connector (14, 18) in dependence of the result of the detection of said detector member (28).
6. The electric striker unit (2) according to any of claims 1-5, wherein one of said first type and second type is a screw type connector, and the other is a female plug-in connector.

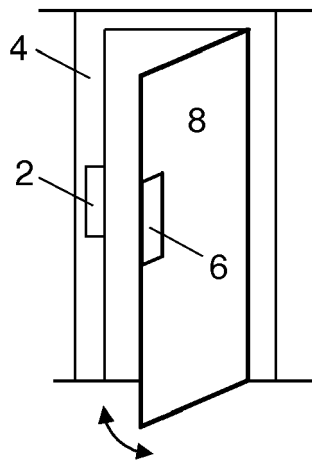


FIG. 1

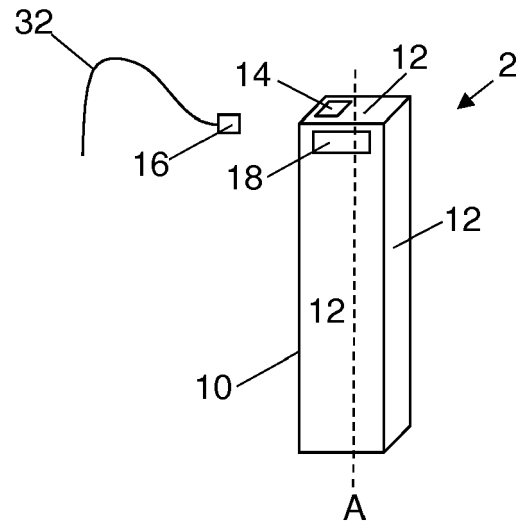


FIG. 2

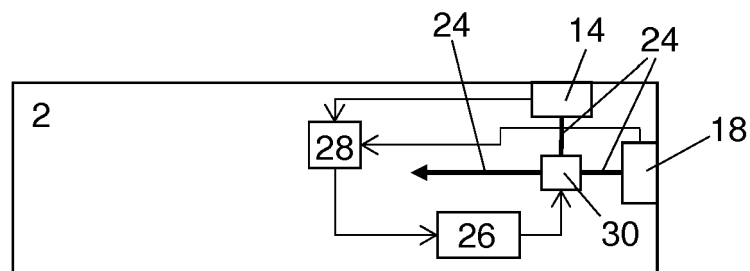


FIG. 3

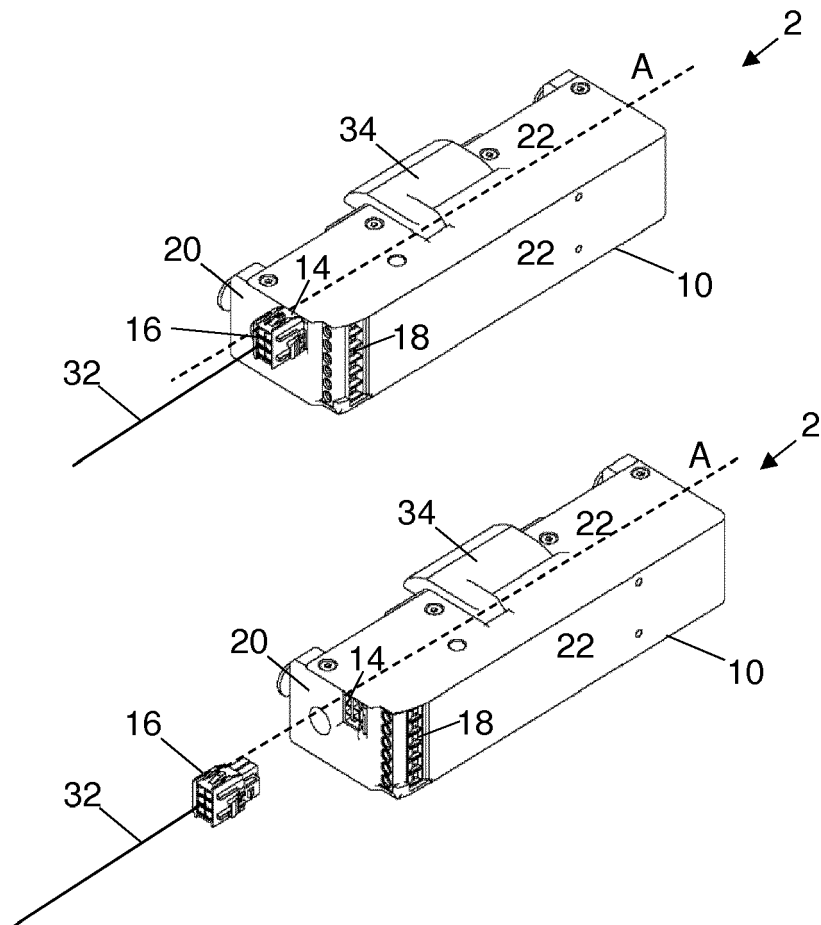


FIG. 4



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Application Number
EP 19 19 3539

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 January 2020	Examiner Antonov, Ventseslav
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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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