(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 180 549 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.04.2010 Bulletin 2010/17

(51) Int Cl.:
H01R 4/48 *(2006.01)*

(21) Application number: **09380154.6**

(22) Date of filing: **28.09.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **07.10.2008 ES 200802026 U**

(71) Applicant: **Simon, S.A.**
08013 Barcelona (ES)

(72) Inventor: **Moret Codina, Maria Cristina**
08021 Barcelona (ES)

(74) Representative: **Espiell Volart, Eduardo Maria et al**
R. Volart Pons y Cia. S.L.
Pau Claris, 77, 2.o, 1.a
08010 Barcelona (ES)

(54) Quick-connection key for electrical mechanisms, with safety interlocking

(57) It consists of a key in an elastic material -1- ending, at its lower end, in a projection -2- and an appendage by way of a flap -3- joined to the inner part of the base -1a- of the key -1- by the connecting point -4-, which permits the displacement of the entire appendage -3-, bringing it closer to or away from the base -1a- of the key, thus returning to its initial position, depending on whether said appendage -3- is pressed or ceases to be pressed.

Said appendage -3- features a lip -5- which occupies the outer half of its end and is arranged outwards, the outer surface -3b- of the appendage-3-lying behind the ip -5- and the rest of the surface, completely flat and smooth, continues until a curvature -3a-, a surface which rests, tightening and sliding, upon a stub -6- of the body -7- of the mechanism in the inner area of a flange -8a- in the lower part -8- thereof.

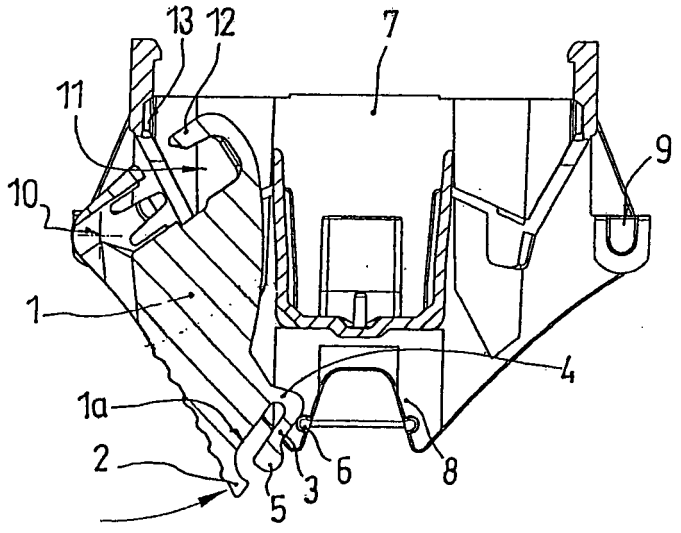

FIG. 2

EP 2 180 549 A1

Description

[0001] The present invention patent relates to a quick-connection key, of the type provided in electrical mechanisms intended for command and/or control, such as switches, push buttons, cross-over switches, plug outlets and such like, **characterised in that** they are equipped with a safety interlock, its essential special features being described below.

[0002] The need for installers to be able to reduce the time spent to correctly carry out the connection of the various conductor wires which come into as much contact as possible with the body of an electrical mechanism in the applications cited, such as, for example, in the previous paragraph, has led to the development of different devices, all of which are intended for this practical purpose.

[0003] Among these devices stand out quick-connection keys, currently known and applied, i.e. keys which permit this operation to be carried out with the simple insertion of the end of the wire to be connected into the hollow which it has for this purpose, and a subsequent displacement of the key in swinging direction being carried out with the aim of holding the aforementioned cable and guaranteeing its positioning and removability, while at the same time ensuring that the key itself ceases to be an external obstacle, as it is situated next to the wall of the body of the mechanism.

[0004] Nevertheless, this device features the drawback that it can become accidentally separated from the aforementioned position, from the body, as the wire that was previously connected becomes unattached and can leave its housing, disconnecting and leaving the electrical mechanism in an incorrect situation in which the operation thereof can no longer be guaranteed.

[0005] The quick-connection key provided with a safety interlocking, and which is object of the present invention, offers a practical and efficient solution, offering at the same time complete simplicity, as it features an interlocking, constituted at the lower end of the key, which fastens by clipping onto a projection at the lower part of the body of the mechanism, thereby preventing any accidental displacement of the key.

[0006] The special arrangement and structure of this interlocking permits that at any moment, and by means of the voluntary and manual actuation of the installer, that lower end of the key, which constitutes the interlocking, can be unlocked, permitting the key to be separated, by means of its swinging, in order to remove the wire or place it, if it still was not connected.

[0007] With the aim of aiding in the description of the quick-connection key, provided with a safety interlocking, motive for this invention, drawings have been attached which represent a practical embodiment of said key provided with the safety interlocking, substantially described in an illustrative manner.

[0008] In these drawings,

- fig. 1 is a sectional view of the body of the mechanism, a quick-connection key being situated on one side thereof in its initial opening position, suitable to place the end of the wire or electrical conductor which is to be connected;
- fig. 2 is a complementary view of the previous figure, with the key displaced towards the connecting position;
- fig. 3 is an enlarged close-up view of the lower area of the key, which configures the interlocking, in the position prior to its clipping on the projection of the bottom of the body;
- fig. 4 is a close-up, also cross-sectional, similar to figures 1 and 2, showing the key fastened by its safety interlocking; and finally,
- fig. 5 is a perspective and partially cross-sectional view of the body of the mechanism, with the key locked, this drawing also being sectional at the same cross-section plane as the body.

[0009] In accordance with the drawings indicated, the quick-connection key provided with a safety interlocking, used in electrical mechanisms such as switches, push buttons, cross-over switches, plug outlets and such like, consists of a key -1-, of suitable design and characteristics for its use in the quick connection, with its lower part finishing in a quadrangular and rounded off projection -2- and an appendage -3-, in the form of a tongue, solidly joined to the inner part of the base of the key at the connecting area -4-, which provides the array with the possibility that the entire appendage -3- can be displaced towards the inner part of the base -1 a- of the key -1- when it is pressed, thanks to the elasticity of the material with which the key has been manufactured, the appendage returning to its initial position at the moment when this pressure is no longer exerted.

[0010] The aforementioned appendage -3- is characterized by the lip -5- of the outer half of its end, which is rounded off and situated facing outwards, constituting the element which actuates as interlocking when the key -1- is in the final connecting position, as represented in figures 4 and 5. On the rear part of this lip -5-, the outer surface -3b- of the appendage -3- is completely flat, continuously until the end curvature -3a-, said flat and smooth surface - 3b- being the one which supports it, squeezing against it, and it will slide on a stub -6- on the body -7- of the electrical mechanism in the inner area of the flange -8a- of its lower part -8-. This support and sliding is performed when the key -1- is pushed by the stub -6- whereon it is tightened, it is folded inwards and moves towards the aforementioned internal part of the base - 1a- of the key -1-, until the moment when, arriving at the end of its displacement, the lip -5- is situated above the stub -6-, thus remaining held back and, consequently, the key -1- being fastened in this position.

[0011] The quick-connection key -1- is placed on the U-shaped housing -9- of the body -6- of the mechanism on both sides. In the various figures, the housing of the

side is visible where the quick-connection key -1- is not placed, while the key itself -1- hides the housing where it is placed and whereon it swings freely, although the axis of rotation -10- of the quick-connection key -1- is indicated with tracing lines in its swinging movement. (See figures 1, 2 and 4).

[0012] The hollow -11- of the upper part of the key -1- can also be observed in the different figures, where the end of the wire to be connected (not drawn) is inserted, and which causes the retention of the wire for its connection.

[0013] Once the lip -5- has been held back above the stub -6-, the operator will be able to unlock the interlocking by pressing the lip -5-, releasing it from the stub -6-, thanks to the elasticity, previously mentioned, of the material with which the entire key -1- has been manufactured.

[0014] Once this action has been carried out, the key -1- will be able to swing again with the aim of removing the wire which could be connected or placing one for its connection.

[0015] The object of the present invention having been sufficiently described, it should be pointed out that any variation in shapes, dimensions, appearance and type of materials used in the practical embodiment of these keys provided with interlocking, shall not in any way alter the essentiality thereof, which is summarised in the following claims.

Claims

1. Quick-connection key for electrical mechanisms, with safety interlocking, mechanisms such as switches, push buttons, cross-over switches, plug outlets and such like, **characterised in that** it consists of a key in an elastic material -1-, suitable for the quick connection of electrical wires, which has a lower part ending in a projection -2- and an appendage in the shape of a tongue -3- joined to the lower part of the base -1 a- of the key -1- at its connecting point -4-, which permits the displacement of the entire appendage -3-, bringing it closer to or away from the base -1a- of the key, thus returning to its initial position, depending on whether said appendage -3- is pressed or ceases to be pressed.

2. Quick-connection key for electrical mechanisms, with safety interlocking, according to the previous claim, **characterised in that** the appendage -3- features a lip -5-, which occupies the outer half of its end and is arranged facing outwards, the outer surface -3b- of the appendage - 3- lying behind the lip -5- and the rest of the surface, completely flat and smooth, continues until a curvature -3a-, a surface which rests, tightens and slides, upon a stub -6- of the body -7- of the mechanism in the inner area of a flange -8a- of its lower part -8- thereof, support and sliding which is carried out when the key -1-is swung towards the interior, against the side -7a- of the aforementioned body -7-, moment when the appendage - 3- is folded inwards, moving closer to the base -1a- of the key -1-, permitting said lip -5- to be located on the stub -6-, and acting as safety interlocking or unlocking due to its elasticity.

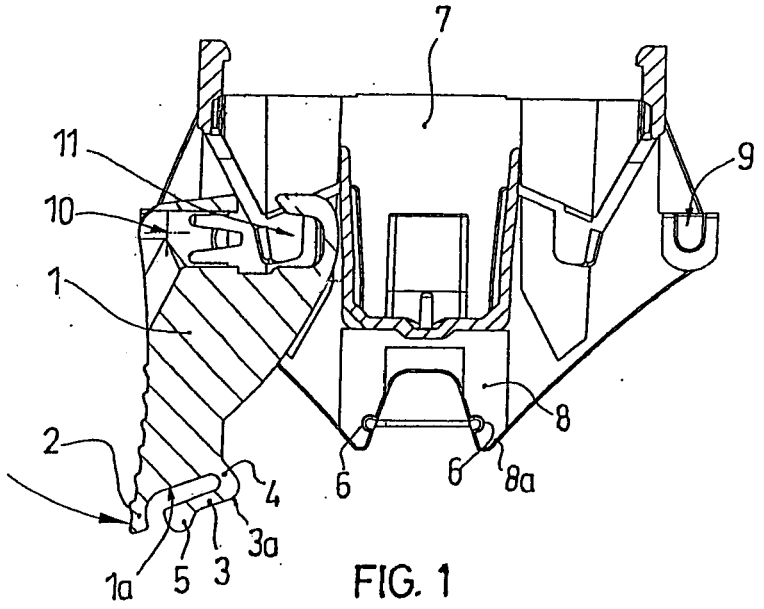

FIG. 1

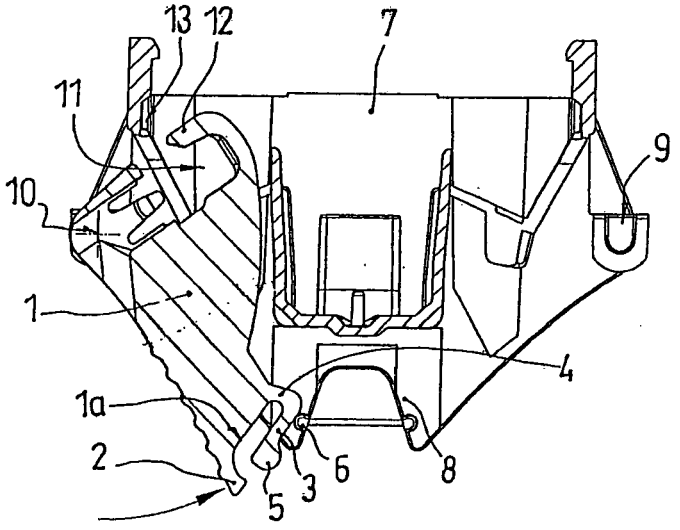

FIG. 2

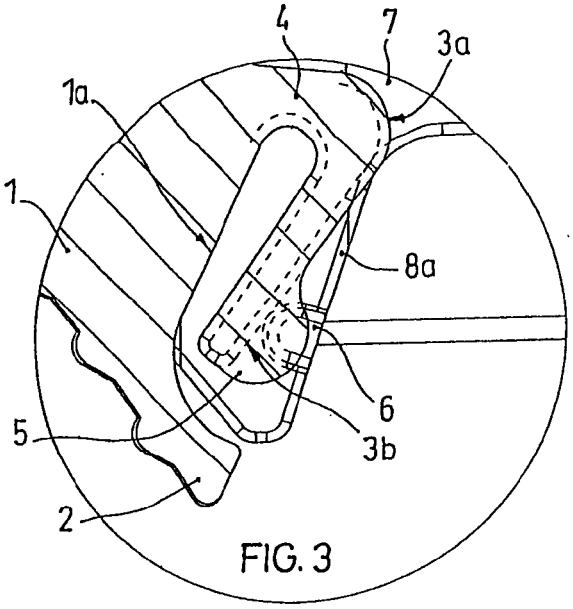

FIG. 3

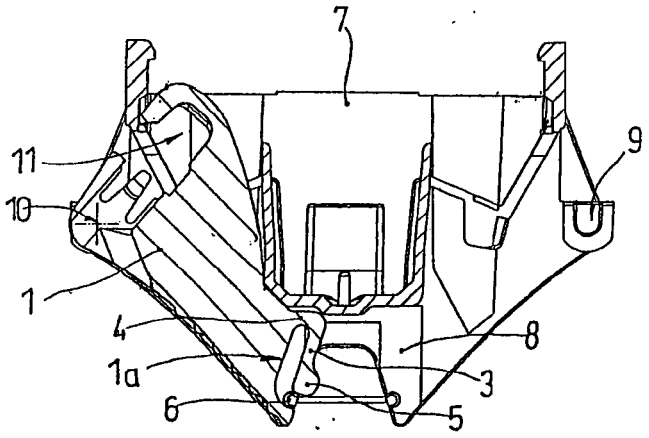

FIG. 4

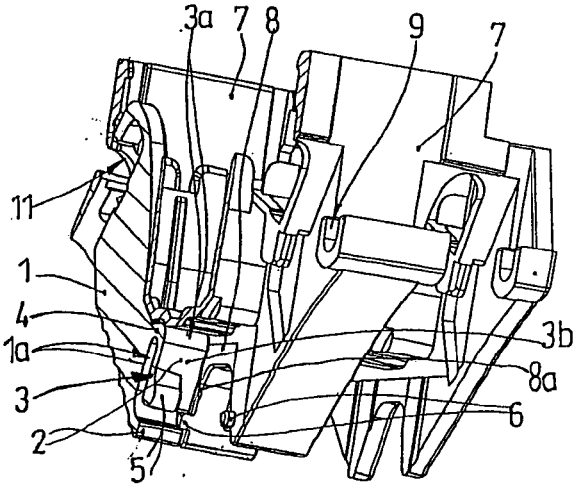

FIG. 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 38 0154

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	US 2002/074218 A1 (MORET CODINA MARIA CRISTINA [ES]) 20 June 2002 (2002-06-20) * paragraphs [0001], [0022]; figures 1,2,6,8,9 *	1 2	INV. H01R4/48
Y	US 6 174 179 B1 (OKABE TOSHIAKI [JP]) 16 January 2001 (2001-01-16) * column 1, line 53 - column 2, line 38; claims 1-4; figure 3 *	1	
A	US 2003/008569 A1 (MATSUMOTO ATSUSHI [JP] ET AL) 9 January 2003 (2003-01-09) * paragraph [0053] - paragraph [0060]; figures 18-19 *	1	
A	US 2002/076972 A1 (MORET CODINA MARIA CRISTINA [ES]) 20 June 2002 (2002-06-20) * paragraph [0018]; figures 3-5 *	1	
A	EP 1 672 741 A1 (PLAST S R L AB [IT]) 21 June 2006 (2006-06-21) * paragraph [0008] - paragraph [0013]; figures 2,4 *	1	TECHNICAL FIELDS SEARCHED (IPC) H01H H01R
A	EP 1 928 058 A1 (LEGRAND FRANCE [FR]; LEGRAND SNC [FR]) 4 June 2008 (2008-06-04) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 March 2010	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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 38 0154

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-03-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002074218 A1	20-06-2002	AR 031036 A1	03-09-2003
		AT 501540 A1	15-09-2006
		BE 1014955 A3	06-07-2004
		BR 8102250 U	25-06-2002
		CN 1369934 A	18-09-2002
		DE 20117652 U1	28-02-2002
		ES 1047527 U	16-04-2001
		FR 2816454 A1	10-05-2002
		HU 2288 U	28-05-2002
		MA 25450 A1	01-07-2002
		MX PA01010862 A	24-05-2002
		PL 350376 A1	06-05-2002
		PT 102682 A	31-05-2002
		RU 25120 U1	10-09-2002
US 6174179 B1	16-01-2001	DE 19916756 A1	28-10-1999
		JP 11307172 A	05-11-1999
US 2003008569 A1	09-01-2003	CN 1383593 A	04-12-2002
		EP 1284522 A1	19-02-2003
		WO 0191240 A1	29-11-2001
		JP 2001338703 A	07-12-2001
		TW 504878 B	01-10-2002
US 2002076972 A1	20-06-2002	AT 501539 A1	15-09-2006
		BE 1014448 A3	07-10-2003
		BR 8102249 U	25-06-2002
		CN 1369933 A	18-09-2002
		DE 20117651 U1	28-02-2002
		ES 1047528 U	16-04-2001
		FR 2816452 A1	10-05-2002
		HU 2308 U	28-06-2002
		MA 25449 A1	01-07-2002
		MX PA01010861 A	24-05-2002
		PL 350377 A1	06-05-2002
		PT 102683 A	31-05-2002
		RU 25121 U1	10-09-2002
EP 1672741 A1	21-06-2006	NONE	
EP 1928058 A1	04-06-2008	FR 2909227 A1	30-05-2008

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82