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(54) **Electrical connection bridge and block**

(57) Electrical connection bridge (10) comprising two interconnected pins (16) and two insulating sleeves (11, 13) which respectively surround the two pins (16), such that one of said sleeves (11) is provided at its front end with at least one flange portion (12) to prevent the exit of said sleeve from its housing in a connection block (20). When said connection bridge (10) is mounted in a connection block (20), then, once the flanged sleeve (11) has been introduced in its housing, the flange (12) allows the flanged sleeve to rotate and slide but prevents it to be extracted from said housing. The connection bridge provides a bridging with another adjacent connection block, whereby the connection bridge is usually transversal and is incorporated in the first connection block.

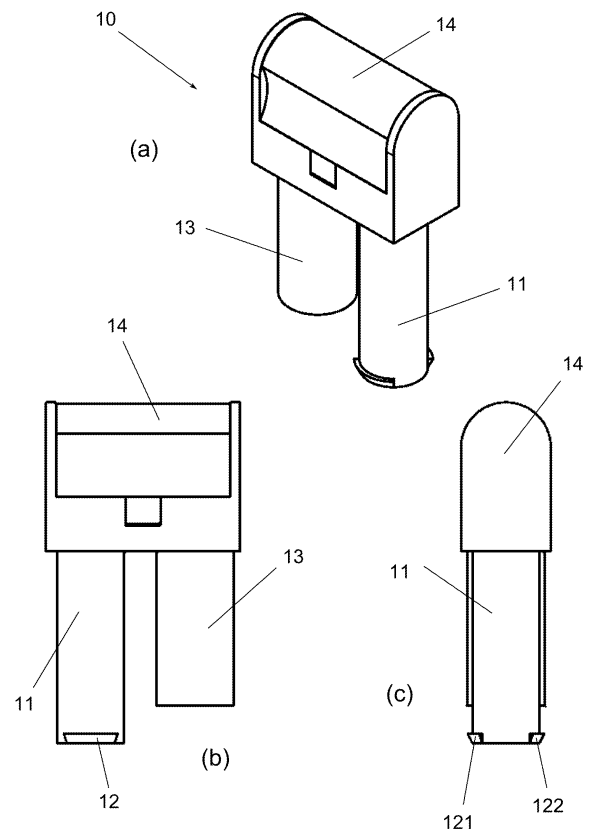


FIG. 1

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## Description

**[0001]** The present invention relates to an electrical connection bridge comprising two interconnected pins. Said bridge can be a part of a connection block and can provide a bridging with another adjacent connection block, whereby usually the connection bridge is transversal and is incorporated in the first connection block.

**[0002]** The present invention also relates to a connection block comprising such a connection bridge.

## BACKGROUND ART

**[0003]** In several electrical applications and devices it is necessary to temporarily establish a bridge between two adjacent connection blocks; usually for this function electrical connection bridges are employed that have a shape similar to a connection plug but with the particular feature that the two pins are connected to each other at their rear end.

**[0004]** In traditional electrical connection bridges the connection pins have a general cylindrical shape, obtained from a bar having a round cross section, such that it is necessary to machine with a lathe the periphery of the connection pins in order to produce two peripheral recesses in which expansion or retention springs or grooved barrels (with cuts) are housed.

**[0005]** Apart from the described machining operation, such connection pins require other machining or handling operations in order to guarantee the connection of the rear ends of the pins. The handling and machining that are necessary for obtaining the conductive bridge with the peripheral recesses that house the barrels increases remarkably the overall cost of the conductive bridge; furthermore, a body of insulating material has to be associated to the bridge in order to conform a suitable area for gripping the connection bridge without the risk of an electrical shock.

**[0006]** In Utility Model ES1062613U the applicant offers an alternative in which the connection pins have a flat prismatic shape with rounded ends and two longitudinal recesses for mounting the barrels. The pins form a single element obtained by stamping.

**[0007]** Known connection bridges are independent from the connection block, and they must be fetched from their storing place when they are needed; they may be stored together with the connection block, but then there is a risk that they get lost.

## SUMMARY OF THE INVENTION

**[0008]** An object of the present invention is to provide a connection bridge and a connection block having said bridge incorporated in it such that the bridge is readily available when needed but there is no risk that it gets lost.

**[0009]** Accordingly, in one aspect of the invention the connection bridge comprises two insulating sleeves which respectively surround two interconnected pins,

such that one of said sleeves is provided at its front end with at least one flange portion which can be locked in the body of the connection block in order to prevent the exit of said sleeve from that specific housing of the connection block.

**[0010]** Said sleeves are preferably of substantially cylindrical configuration, whereby the flanged sleeve can rotate in its housing, in order to bring the other sleeve from a rest position to a connecting position of its pin with the adjacent connection block and vice versa, while the flanged sleeve does not come out of the housing in its connection block. The other sleeve is not provided with a flange, because its design is compatible with standard plugs for test derivations.

**[0011]** The flanged sleeve is longer and narrower than the unflanged sleeve; the latter has a universal diameter to be inserted into standard sockets, such that this unflanged sleeve can exit from its housing like any insulating sleeve when the connection bridge is raised, and due to the difference in length, rotate 90 ° to establish the transversal connection.

**[0012]** In one embodiment said flange portion comprises at least two separate sectors, preferably symmetrical, and in diametrically opposed positions.

**[0013]** In one embodiment at least part of the flange portion is a lug in the shape of a harpoon or the like, which can be inserted into a port but cannot move backwards one introduced, although it can also be foreseen to provide a tongue that is inserted into an annular groove formed at the end of the sleeve. In one embodiment, the pins have a flat prismatic configuration, with rounded front ends, that can be manufactured by stamping. Advantageously said pins are provided with longitudinal recesses for the mounting and retention of corresponding expansion barrels which facilitate electrical contact with corresponding sockets of the terminals which have to be bridged.

**[0014]** In one embodiment the pin corresponding to the flanged sleeve is introduced into a connection socket lacking an insulating sheath, such that said sleeve surrounds said socket. This socket doesn't need the insulating sheath that is provided in the rest of the sockets, because it is not necessary to provide insulation and because the sleeve has a diameter that is smaller than the diameter necessary to introduce the pin in standard sockets. The opening or port where the flanged sleeve remains locked has a smaller diameter than the port of standard sockets, making it impossible, in case of separation, to use standard bridges or plugs with sleeves, and preventing the user from touching the socket.

**[0015]** The connection block with a transversal connection bridge thus defined is formed by a connection bridge and a connecting block, in which the flanged sleeve is inserted into a housing of said block, whereby said flange allows the sleeve to rotate and slide, but prevents it from exiting said housing.

**[0016]** The transversal connection bridge can adopt two stable positions in the connection block, a non-con-

necting position in which the pin corresponding to the unflanged socket does not establish any electrical connection, and a connecting position in which the pins establish an electrical bridge between the connection block provided with the bridge and another adjacent connection block.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0017]** A particular embodiment of the present invention will be described in the following, only by way of non-limiting example, with reference to the appended drawings, in which:

figure 1 shows the portion of the transversal connection bridge;

figure 2 shows a detail of the connection block with the connection bridge in a raised position; and

figure 3 shows a sequence of operations of the connection block with its transverse connection bridge.

#### DESCRIPTION OF PARTICULAR EMBODIMENTS

**[0018]** Figure 1 shows three views of a connection bridge 10: a perspective view (a), a front elevation view (b) and a side elevation view (c).

**[0019]** The connection bridge 10 comprises a U-shaped flat conductive body, which is preferably manufactured by stamping. The legs of the U are two pins 16 (see figure 3) whose ends 17 are rounded. The rear portion 19 of the conductive body, which constitutes the connection between the two pins 16, is covered by an insulating body 14 which can be used for gripping the connection bridge.

**[0020]** Each pin 16 is provided with an expansion barrel 18 to facilitate the contact of the pin with a socket present in a connection block 20. Each pin is arranged inside an insulating sleeve which prevents the user from touching the pin or the barrel, which can be at a high voltage. When the bridge 10 establishes a connection in the block 20, this socket 21 remains housed between the pin 16, with its barrel 18, and the insulating sleeve, in contact with the barrel.

**[0021]** Each insulating sleeve is substantially cylindrical and is joined to the insulating body 14 at its rear end. Of the two insulating sleeves, a first sleeve 11 is provided at its front end with a flange portion 12 which projects outwards from the sleeve; it is herein called "portion" because it doesn't need to extend to the whole periphery of the sleeve end, but it will also be referred to simply as "flange". The flange 12 is not necessarily a connected element: it may be divided in more than one sector.

**[0022]** In the preferred embodiment shown in the figures, the flange portion 12 comprises two symmetrical and diametrically opposed sectors: a first sector 121 and a second sector 122. The flange is a lug in the shape of a harpoon or the like, which is provided with a certain elasticity and the orientation of which allows to insert the

sleeve through the port of its housing in the connection block, but prevents or at least hinders its withdrawal from said housing, because when attempting such withdrawal the rear part of the harpoon abuts against the periphery of said port (see figure 2).

**[0023]** The other insulating sleeve, which can be called second sleeve 13, has no flange and can be inserted and extracted freely from its housing in the connection block 20. This unflanged sleeve 13 is shorter than the flanged sleeve 11, precisely in order to be able to be extracted its housing; if it was as long as the flanged sleeve 11, or longer, then it couldn't exit its housing, as happens with the flanged sleeve.

**[0024]** One of the two sockets 21 of the connection block 21 that have to be connected by means of the bridge 10 has a larger diameter than the other, and therefore it is foreseen that the unflanged sleeve 13 is wider than the flanged sleeve 11. The socket with a smaller diameter is not provided with an insulating sheath which is normally included in the sockets having a standard diameter, but electrocution is nevertheless prevented because said socket is surrounded by the insulating sleeve 11.

**[0025]** Since the connection bridge 20 is provided with the flanged sleeve 11, said bridge can be permanently housed in the connection block 20 and still avoid the risk of getting lost. The connection bridge will normally be in a rest position, in which it does not make any connection, but it is ready to be switched at any time to a working position in which it provides the desired bridging.

**[0026]** Even when the bridge 10 is in a rest position, the pin corresponding to the flanged sleeve 11 is in contact with the corresponding socket 21, because the flanged sleeve doesn't change from one housing to another; but, in this position, the unflanged sleeve 13 is housed in the connection block in such a way that its pin doesn't make any electrical contact.

**[0027]** Figure 3 shows by means of four sub-figures (a, b, c, d) the sequence of operations of the connection bridge 10 in the connection block 20. The operations will be described in the following, naming them according to the letters of the four sub-figures:

(a) the connection bridge 10 is in rest position, with the flanged sleeve 11 inserted into its connection housing, which is its only housing;

(b) the bridge 19 is raised to extract the unflanged sleeve 13 from its rest housing, until the flange 12 of the flanged sleeve 11 abuts with the periphery of the port of its housing;

(c) the bridge is rotated 90° towards the inside of the plane of the drawing, such that the unflanged sleeve 13 remains behind the flanged sleeve 11;

(d) the bridge 10 is lowered in order to insert the unflanged sleeve 13 in its connection housing in an adjacent block, such that the two pins 16 establish the electrical bridge.

**[0028]** When the bridging has to be removed, it is suf-

ficient to perform the same sequence of operations in reverse order.

**[0029]** Although only particular embodiments of the invention have been shown and described in the present specification, the skilled man will be able to introduce modifications and substitute any technical features thereof with others that are technically equivalent, depending on the particular requirements of each case, without departing from the scope of protection defined by the appended claims.

**[0030]** For example, in order to prevent the extraction of the sleeve 11 from its housing in the connection block, the sleeve's flange can be substituted by the provision on the sleeve of an annular groove with a tongue inserted into it, so as to prevent the sleeve from exiting the port of its housing.

### Claims

1. An electrical connection bridge (10) comprising two interconnected pins (16), **characterized in that** it also comprises two insulating sleeves (11, 13) which respectively surround the two pins (16), such that one of said sleeves (11) is provided at its front end with at least one flange portion (12) to prevent the exit of said sleeve from an eventual housing in a connection block (20).
2. A connection bridge as claimed in claim 1, **characterized in that** said flange portion (12) comprises at least two separate sectors (121, 122).
3. A connection bridge as claimed in any of claims 1 or 2, **characterized in that** one of the sleeves (13) is not provided with a flange.
4. A connection bridge as claimed in claim 3, **characterized in that** the flanged sleeve (11) is longer and narrower than the unflanged sleeve (13).
5. A connection bridge as claimed in any of the preceding claims, **characterized in that** the sleeves (11, 13) are substantially cylindrical.
6. A connection bridge as claimed in any of claims 2 to 5, **characterized in that** at least part of the flange portion (12) is a lug in the shape of a harpoon or the like.
7. A connection bridge as claimed in any of the preceding claims, **characterized in that** at least part of the flange portion (12) is a tongue that is inserted into an annular groove of the sleeve.
8. A connection bridge as claimed in any of the preceding claims, **characterized in that** the pins (16) have a flat prismatic configuration, with rounded front ends (17).
9. A connection bridge as claimed in any of the preceding claims, **characterized in that** the pins (16) are provided with longitudinal recesses for the mounting and retention of corresponding expansion barrels (18).
10. A connection block (20) comprising a connection bridge (10) according to any of the preceding claims, whereby once the flanged sleeve (11) has been introduced in its housing, the flange (12) allows the flanged sleeve to rotate and slide but prevents it to be extracted from said housing.
11. A connection block as claimed in claim 10, **characterized in that** the pin (16) corresponding to the flanged sleeve (11) is introduced into a connection socket (21) lacking an insulating sheath, such that said sleeve surrounds said socket.
12. A connection block as claimed in claim 11, **characterized in that** the port of the socket (21) which corresponds to the flanged sleeve (11) has a smaller diameter than the port of standard sockets.
13. A connection block as claimed in any of claims 11 or 12, **characterized in that** the connection bridge (10) can adopt two stable positions, a non-connecting position in which the pin (16) corresponding to the unflanged socket (13) does not establish any electrical connection, and a connecting position in which the pins (16) establish an electrical bridge between the connection block (20) and another adjacent connection block.

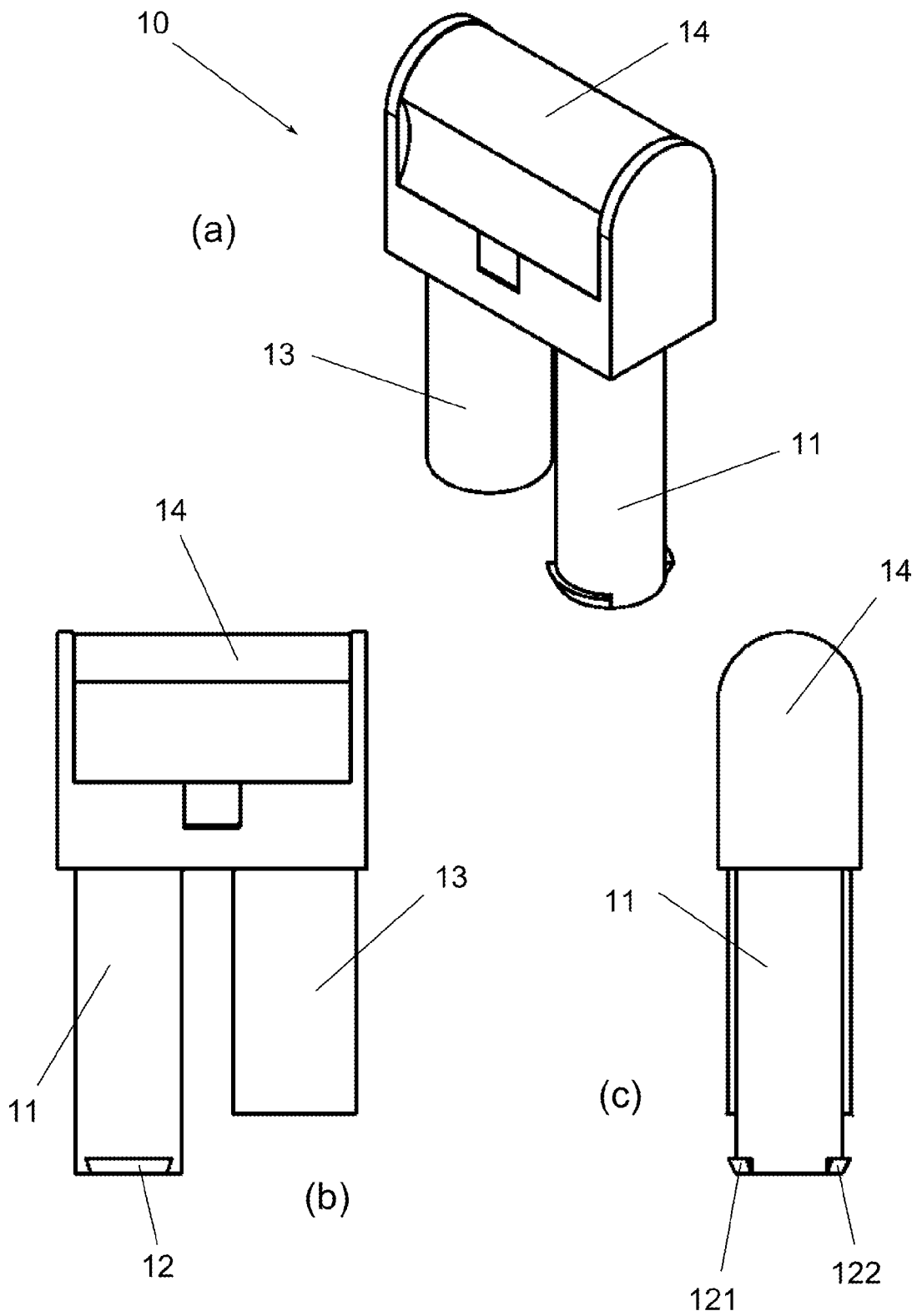


FIG. 1

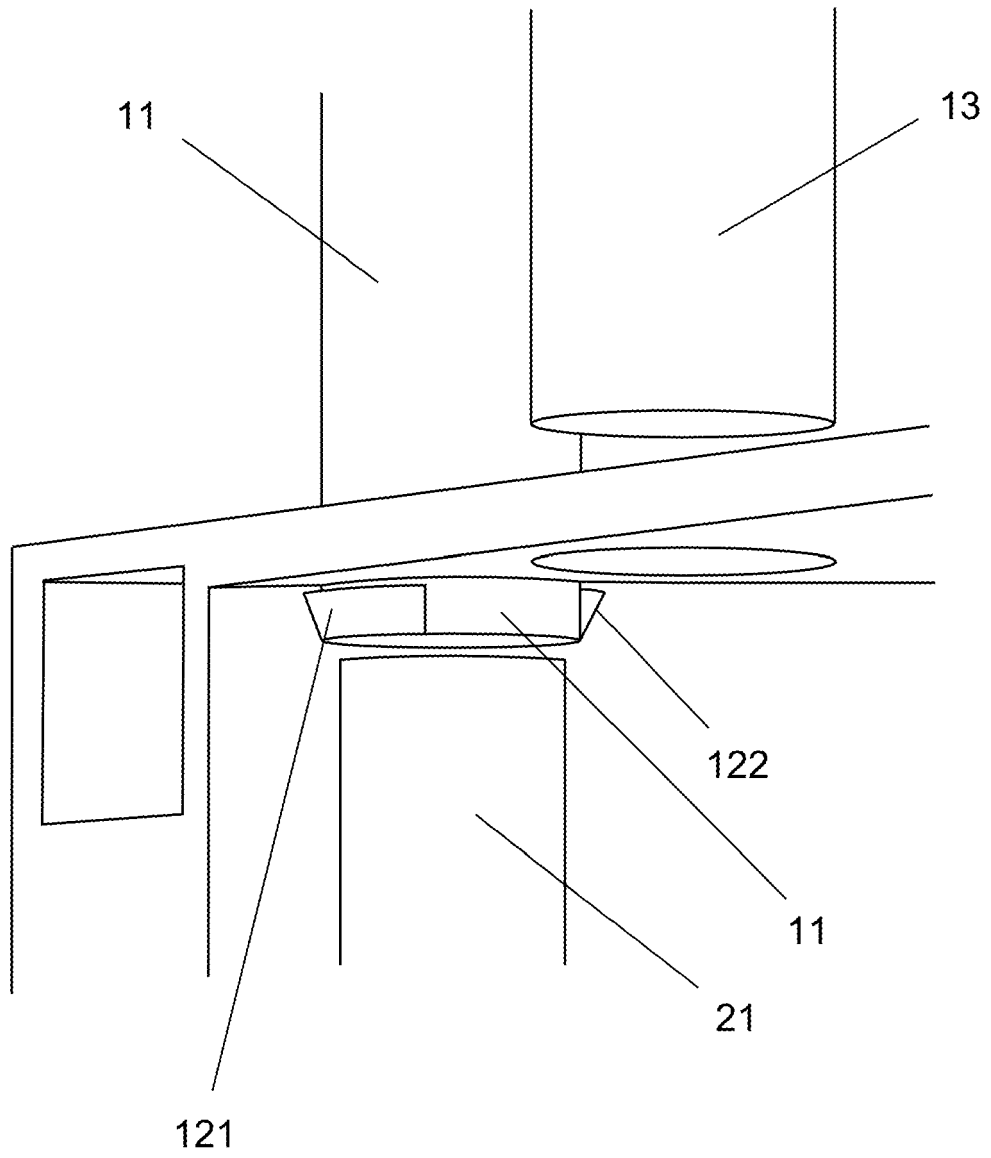


FIG. 2

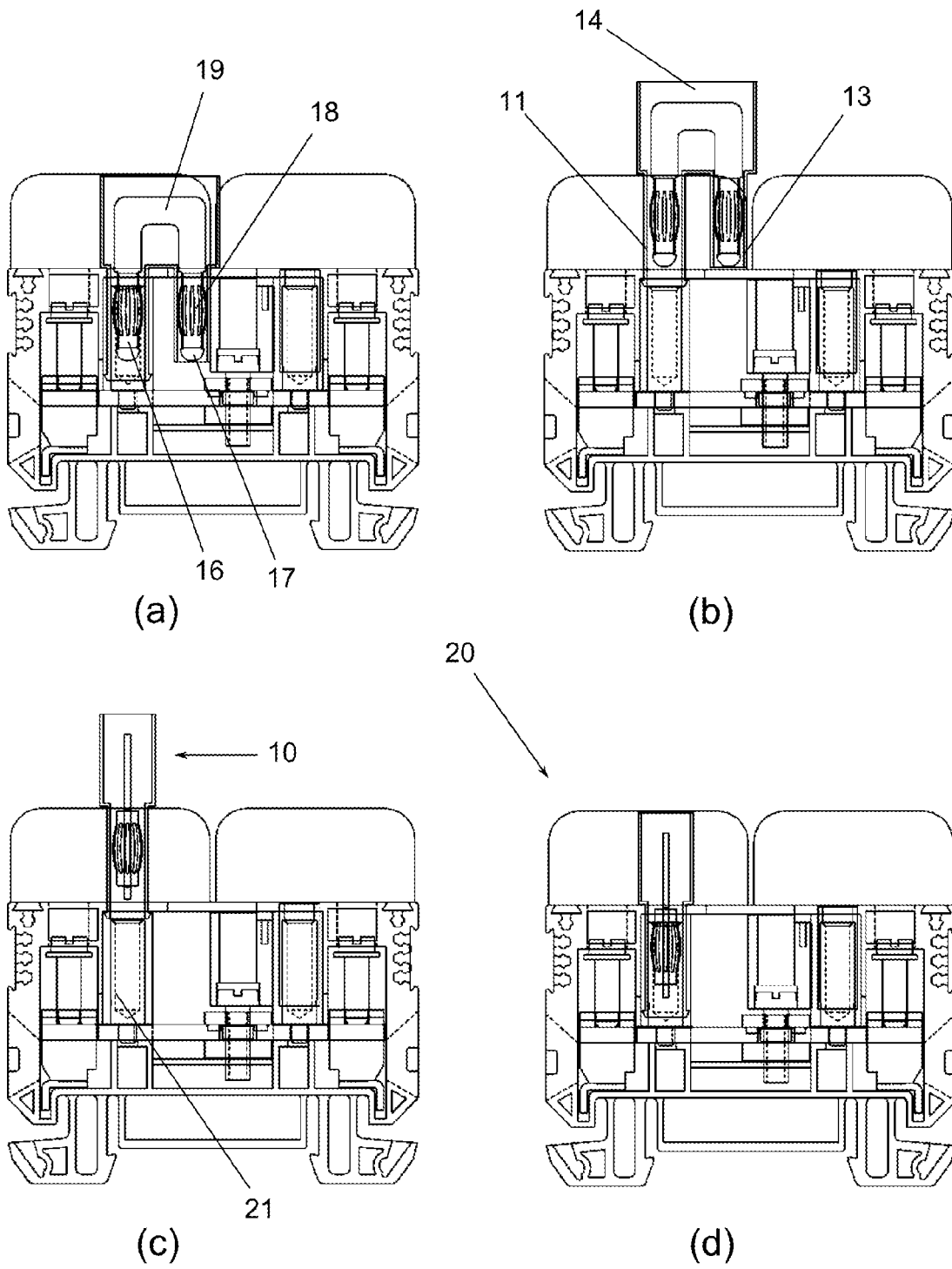


FIG. 3



EUROPEAN SEARCH REPORT

Application Number  
EP 09 16 3402

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	ES 1 062 613 U (GARCIA-MAURINO DELAS FERNANDO [ES]) 1 July 2006 (2006-07-01) * the whole document * -----	1-13	INV. H01R9/26 H01R31/08
A	US 2005/233634 A1 (KOLLMANN HANS-JOSEF [DE]) 20 October 2005 (2005-10-20) * the whole document * -----	1-13	
A	DE 20 2006 003902 U1 (PHOENIX CONTACT GMBH & CO [DE]) 27 July 2006 (2006-07-27) * abstract * * paragraph [0026] - paragraph [0028] * * figures 1,3,4 *	1-13	
A	US 4 969 834 A (JOHNSON ROBERT A [US]) 13 November 1990 (1990-11-13) * abstract * * column 6, line 7 - line 13 * * figure 1 *	1-13	
A	US 2006/160413 A1 (ROBINSON DARRELL [US] ET AL) 20 July 2006 (2006-07-20) * abstract * * figures 5-8 * -----	1-13	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			H01R H02B
Place of search		Date of completion of the search	Examiner
The Hague		20 July 2009	Chelbosu, Liviu
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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EPO FORM 1503 03.02 (P04C01)

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

EP 09 16 3402

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20-07-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
ES 1062613	U	01-07-2006	NONE	
-----				
US 2005233634	A1	20-10-2005	CN 1738098 A	22-02-2006
			DE 102004018554 A1	03-11-2005
			JP 2005302732 A	27-10-2005
			TR 200500830 A2	21-02-2006
-----				
DE 202006003902	U1	27-07-2006	EP 1833126 A2	12-09-2007
-----				
US 4969834	A	13-11-1990	NONE	
-----				
US 2006160413	A1	20-07-2006	NONE	
-----				

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- ES 1062613 U [0006]