



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.01.2013 Bulletin 2013/01

(51) Int Cl.:
H01R 24/60 (2011.01)

(21) Application number: **11171536.3**

(22) Date of filing: **27.06.2011**

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME

• **Schulte, Martin, Dr.-Ing.**
58097 Hagen (DE)
• **Kaszycki, Norbert**
90-132 Lodz (PL)

(71) Applicant: **CCS Technology, Inc.**
Wilmington, DE 19803 (US)

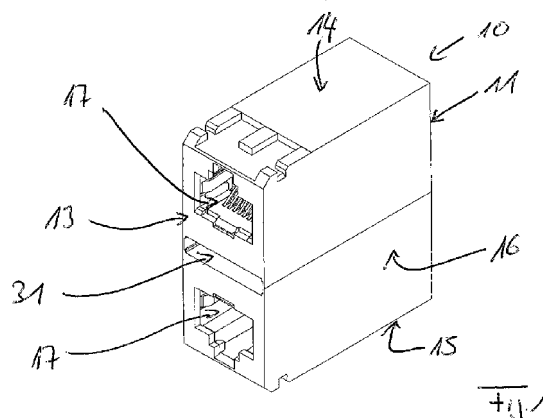
(74) Representative: **Sturm, Christoph**
Quermann Sturm Weilnau
Patentanwälte
Unter den Eichen 7
65195 Wiesbaden (DE)

(72) Inventors:
• **Matthies, Jürgen, Dipl.-Ing.**
58300 Wetter (DE)

(54) **Communication connector assembly**

(57) A communication connector assembly, comprising a housing (11) for receiving at least one connection module (12a, 12b), whereby the housing has at least one front opening (17) for receiving at least one plug connector for connecting the same with a respective connection module (12a, 12b), whereby the housing has at least one back opening (18) through which the respective connection module (12a, 12b) is insertable into or removable from the housing (11), and whereby the respective connection module (12a, 12b) is held within the housing by a releasable spring mechanism (14) of the respective connection module (12a, 12b), the spring mechanism (24) having a flexible protrusion (25) acting together with a wall section (26) of the housing (11); wherein the housing receives a first connection module (12a) in a first orientation and a second connection module (12b) in a second orientation turned up side down with respect to the first connection module (12a); wherein each of the connection modules (12a, 12b) can be connected with a plug connector through a respective front opening (17) of the housing; wherein each of the connection modules (12a, 12b) can be inserted into or removed from the housing through a respective back opening (18) of the housing (11); wherein the flexible protrusion (25) of the spring mechanism (24) of the first connection module (12a) is adjacent to the flexible protrusion (25) of the spring mechanism (24) of the second connection module (12b) when the both connection module are inserted into the housing so that the flexible protrusions (25) of the both connection module (12a, 12b) can both be released by a common tool to be inserted into the housing between the two con-

nection modules (12a, 12b). (Figure 1)



Description

[0001] The present patent application relates to a communication connector assembly.

[0002] EP 1 191 646 B discloses communication connector assembly comprising a jack housing for receiving one connection module. The jack housing has a front section defining a front opening for receiving a plug connector to be connected with the connection module. Further on, the jack housing has a back section defining a back opening through which the connection module is insertable into or removable from the jack housing.

[0003] It is also known from the prior art that the connection module of a connector assembly having a single connection module is held within the jack housing by a releasable spring mechanism of the respective connection module. The spring mechanism comprises an elastic protrusion or flexible protrusion meshing with a wall section of the jack housing when the connection module is inserted into the jack housing. For removing such a connection module from the jack housing the flexible protrusion of spring mechanism has to be released. This is done by a tool to be inserted into a top wall running between the front section and the back section of the jack housing. Such a design limits the ability to increase the density of communication connectors which can be arranged in a defined space.

[0004] Against this background, the problem to be solved is to provide a novel handling communication connector assembly. This problem is solved by a communication connector assembly according to claim 1.

[0005] Within the novel communication connector assembly the housing receives a first connection module in a first orientation and a second connection module in a second orientation turned up side down with respect to the first connection module; whereby each of the connection modules can be connected with a plug connector through a respective front opening of the housing; whereby each of the connection modules can be inserted into or removed from the housing through a respective back opening of the housing; and whereby the flexible protrusion of the spring mechanism of the first connection module is adjacent to the flexible protrusion of the spring mechanism of the second connection module when the both connection modules are inserted into the housing so that the flexible protrusions of the both connection modules can both be released by a common tool to be inserted into the housing between the two connection modules. It is possible to increase the density of communication connectors which can be arranged in a defined space.

[0006] According to a preferred development, the flexible protrusion of the spring mechanism of the first connection module and the flexible protrusion of the spring mechanism of the second connection module mesh both with a common wall section of the housing when the connection modules are inserted into the housing. Such a design is simple and reliable.

[0007] Preferred embodiments of the handling device are given in the dependent claims and the description below. Exemplary embodiments will be explained in more detail with reference to the drawing, in which:

5

Figure 1 shows a perspective view of a novel communication connector assembly;

Figure 2 shows a cross section through the communication connector assembly of Figure 1;

10

Figure 3 shows the communication connector assembly of Figure 1 together with a tool;

Figure 4 shows the communication connector assembly of Figure 1 together with the tool being inserted into the assembly;

15

Figure 5 shows a cross section through the communication connector assembly of Figure 4;

Figure 6 shows the cross section of Figure 4 with one connection module being partly removed from the assembly housing;

20

Figure 7 shows the communication connector assembly of Figure 1 with one connection module being removed from the assembly; and

Figure 8 shows the cross section of Figure 7.

25

[0008] Figures 1 to 8 show different views of a novel communication connector assembly 10.

[0009] The communication connector assembly 10 shown in Figures 1 to 8 comprises a housing 11 receiving two connection modules 12a, 12b. The housing 11 receives a first connection module 12a in a first orientation and a second connection module 12b in a second orientation turned up side down with respect to the first connection module 12a.

30

[0010] The housing 11 has a front wall 13, a top wall 14, a bottom wall 15 and side walls 16. It is also possible that the housing 11 has a back wall. The walls define an interior of the housing 11 for receiving the connection modules 12a and 12b.

35

[0011] The housing 11 comprises front openings 17 provided in a front section, namely in the front wall 13, of the housing 11. The front openings 17 are provided for receiving plug connectors (not shown) to be connected with the connection modules 12a, 12b. Each front opening 17 can receive one plug connector (not shown).

40

[0012] The housing 11 comprises further back openings 18 through which the connection modules 12a, 12b are insertable into or removable from the housing 11.

[0013] Each connection module 12a, 12b comprises a wire board 19 (see especially Figure 8), whereby on the one hand terminal contacts 20 and on the other hand IDC contacts 21 are electrically connected with the wire board 19.

45

[0014] The terminal contacts 20 of each connection module 12a, 12b provide electrical connections with a plug connector (not shown). The IDC contacts 21 of each connection module 12a, 12b provide electrical connections with wires of a data cable (not shown).

55

[0015] The terminal contacts 20 of the respective con-

nection module 12a, 12b are hold by a first holding element 22 and the IDC contacts 21 of the respective connection module 12a, 12b are hold by a second holding element 23. The wire board 19 is positioned between the first holding element 22 and a so-called compression piece 32. The first holding element 22, the second holding element 23 and the compression piece 32 are made from plastic and are electrically non conductive.

[0016] Each connection module 12a, 12b further comprises a releasable spring mechanism 24 having a flexible or elastic, snapping protrusion 25. When the connection modules 12a, 12b are inserted into the housing 11, the same are hold within the housing 11 by the spring mechanisms 24. For removing a connection module 12a, 12b from the housing 11 the respective spring mechanism 24 has to be released.

[0017] Due to the fact that two identical connection modules 12a, 12b are positioned up side down with respect to each other within the housing 11, the flexible protrusions 25 of the same are positioned adjacent to each other when the both connection modules 12a, 12b are inserted into the housing 11, so that the flexible protrusions 25 of the both connection modules 12a, 12b act both together with a common wall section 26 of the the housing 11, and that both connection modules 12a, 12b can be released by a common tool 27 to be inserted into the housing 11 between the two connection modules 12a, 12b.

[0018] The housing 11 comprises an insertion opening 31 for the tool 27 in the region of the front wall 14 positioned between the front openings 17 of the housing 11 assigned to the connection modules 12a, 12b. The common releasing tool 27 can be inserted into the housing 11 between the adjacent connection modules 12a, 12b through the insertion opening 31 from the front of the housing 11 in a direction running parallel to the insertion direction of the plug connectors (not shown) into the front openings 17.

[0019] The flexible protrusion 25 of the spring mechanism 24 of the first connection module 12a and the flexible protrusion 25 of the spring mechanism 24 of the second connection module 12b mesh both with the common wall section 26 of the housing 11 when the connection modules 12a, 12b are inserted into the housing 11.

[0020] The wall section 26 comprises two undercuts 28 each providing a stroke 29 for one of the flexible protrusions 25. The strokes prevent the connection modules 12a, 12b from being removed from the housing 11 with unreleased spring mechanisms 24.

[0021] When the tool 27 is inserted into the housing 11 through the opening 31, both spring mechanisms 24 become simultaneously unreleased and each of the connection modules 12a, 12b can be removed independently from each other from the housing 11. So, it is possible to remove only one connection module 12a or 12b from the housing 11 while the other connection module 12b or 12a stays in place. So, the electrical connections of the connection module 12b or 12a which stays in place

become not interrupted when removing the other connection module 12a or 12b from the housing 11.

[0022] The undercuts 28 of the wall section 26 provide a protrusion 30 of the wall section 26 separating the flexible protrusions 25 of the spring mechanisms 24 of the connection modules 12a, 12b. This helps to avoid that one of the flexible protrusions 25 of the spring mechanisms 24 can block the other flexible protrusions 25.

[0023] When a connection module 12a or 12b becomes inserted into the housing 11 thorough one of the back openings 18 the flexible protrusion 25 of the respective spring mechanism 24 becomes deformed by the wall section 26 of the the housing 11 and the flexible protrusion 25 snaps back meshing with one of the strokes 29 when the same has passed the undercuts 28 of the wall section 26 thereby securing the connection module 12a or 12b within the housing 11.

[0024] The housing 11 is preferably made from a metallic material or from a plastic material carrying a metallic coating for providing a shielded communication connector assembly 10.

List of reference numerals

[0025]

10	communication connector assembly
11	housing
12a	communication module
12b	communication module
13	front wall
14	top wall
15	bottom wall
16	side wall
17	front opening
18	back opening
19	wire board
20	terminal contact
21	IDC contact
22	first holding element
23	second holding element
24	releasable spring mechanism

25 flexible protrusion
 26 wall section
 27 tool
 28 undercut
 29 stroke
 30 protrusion
 31 insertion opening
 32 compression piece

tion modules (12a, 12b).

2. The communication connector assembly as claimed in claim 1, **characterised in that** the housing (11) has an insertion opening (31) for the tool positioned between the front openings (17) of the housing (11) assigned to the connection modules (12a, 12b).

3. The communication connector assembly as claimed in claim 1 or 2, **characterised in that** the flexible protrusion (25) of the spring mechanism (24) of the first connection module (12a) and the flexible protrusion (25) of the spring mechanism (24) of the second connection module (12b) mesh both with a common wall section (26) of the housing (11) when the connection modules (12a, 12b) are inserted into the housing (11).

Claims

1. A communication connector assembly, comprising a housing (11) for receiving at least one connection module (12a, 12b), whereby the housing (11) has at least one front opening (17) for receiving at least one plug connector to be connected with a respective connection module (12a, 12b), whereby the housing (11) has at least one back opening (18) through which the respective connection module (12a, 12b) is insertable into or removable from the housing (11), and whereby the respective connection module (12a, 12b) is held within the housing (11) by a releasable spring mechanism (14) of the respective connection module (12a, 12b), the spring mechanism (24) having a flexible protrusion (25) acting together with a wall section (26) of the housing (11); **characterised in that**

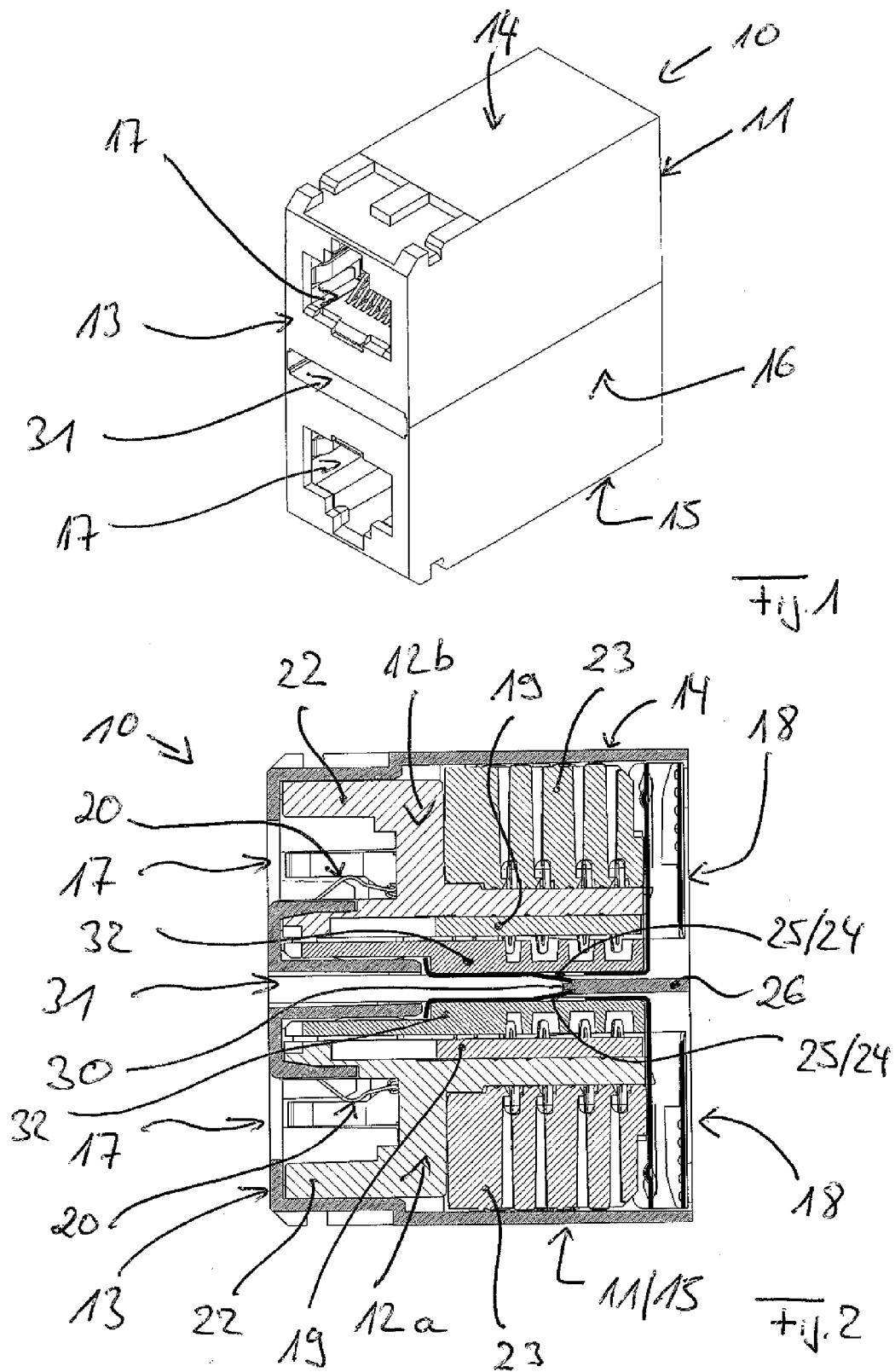
4. The communication connector assembly as claimed in claim 3, **characterised in that** the wall section (26) comprises undercuts (28) each providing a stroke (19) for one of the flexible protrusions (25).

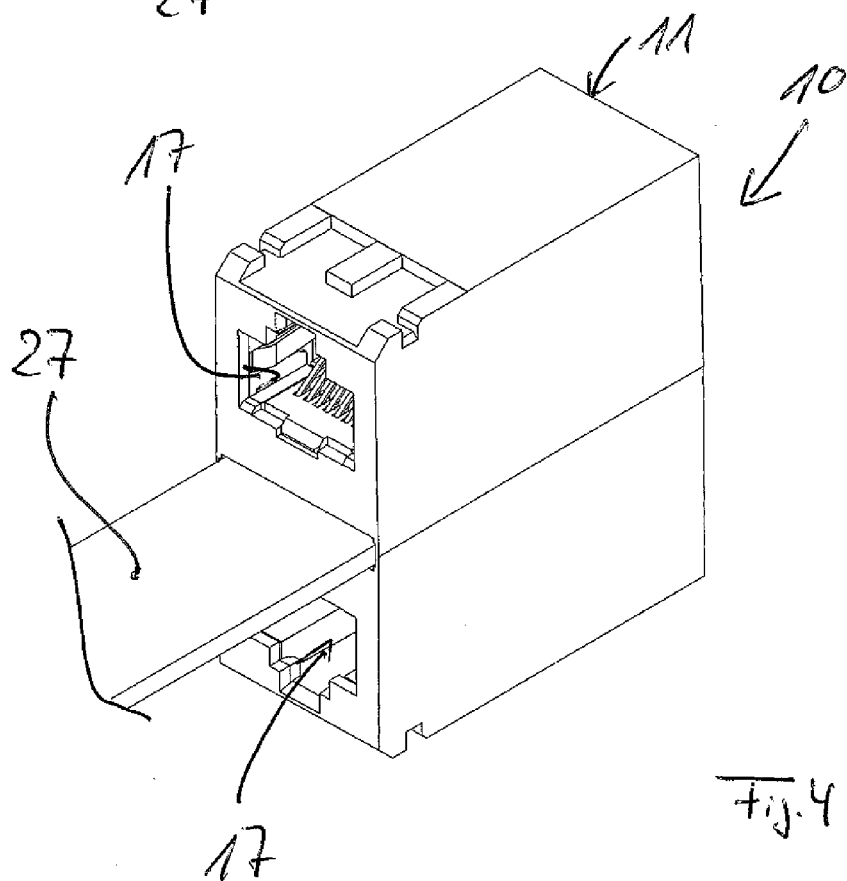
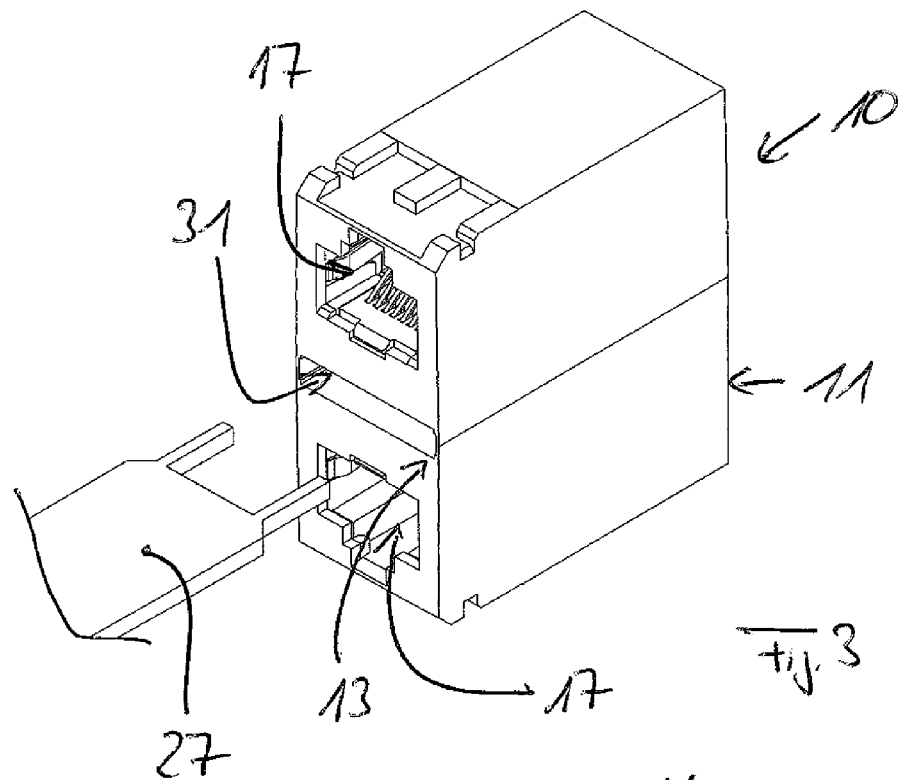
5. The communication connector assembly as claimed in claim 3 or 4, **characterised in that** the undercuts (28) of the wall section (26) provide a protrusion (30) of the wall section (26) separating the flexible protrusions (25) of the spring mechanisms (24) of the connection modules (12a, 12b).

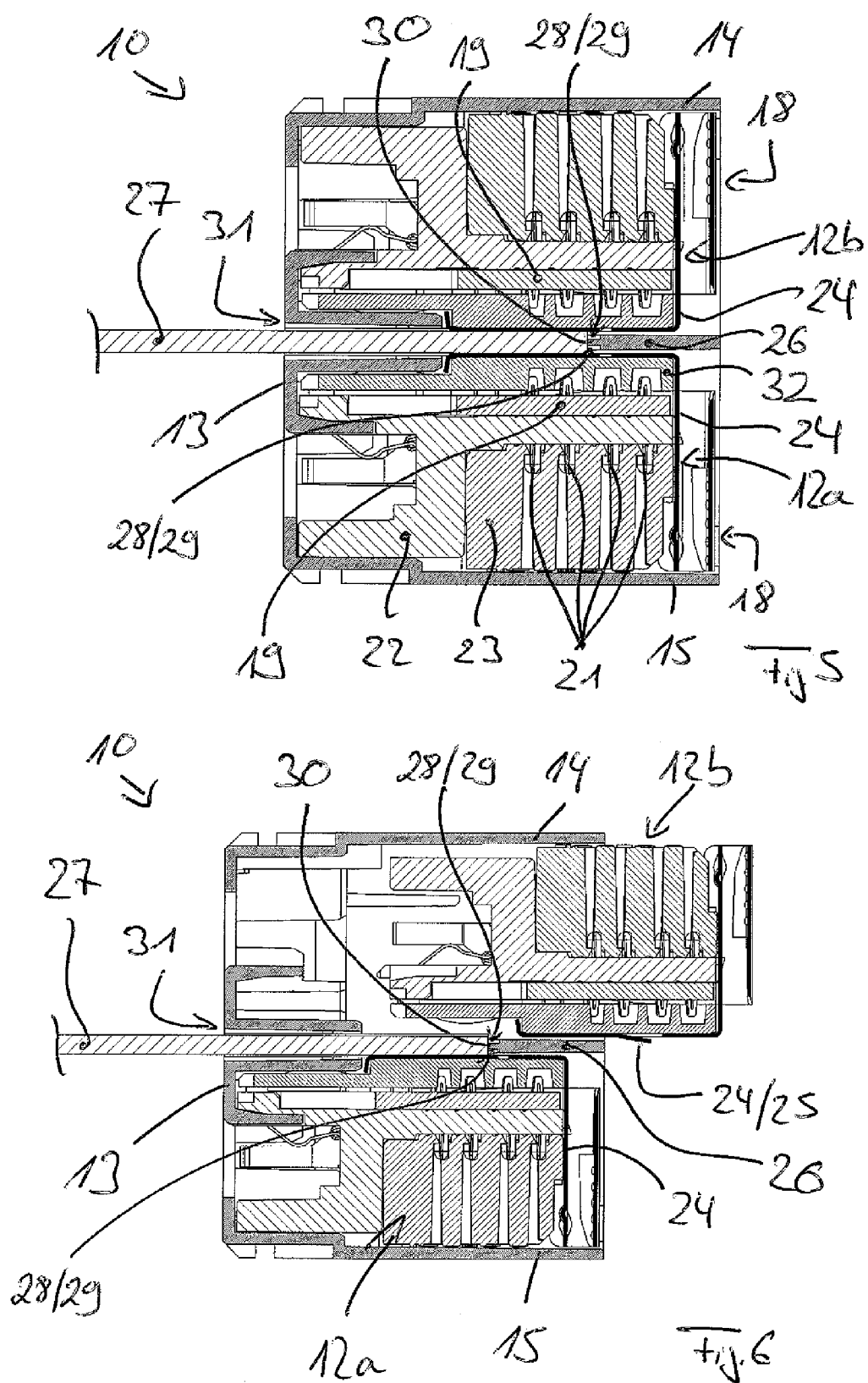
the housing (11) receives a first connection module (12a) in a first orientation and a second connection module (12b) in a second orientation turned up side down with respect to the first connection module (12a);

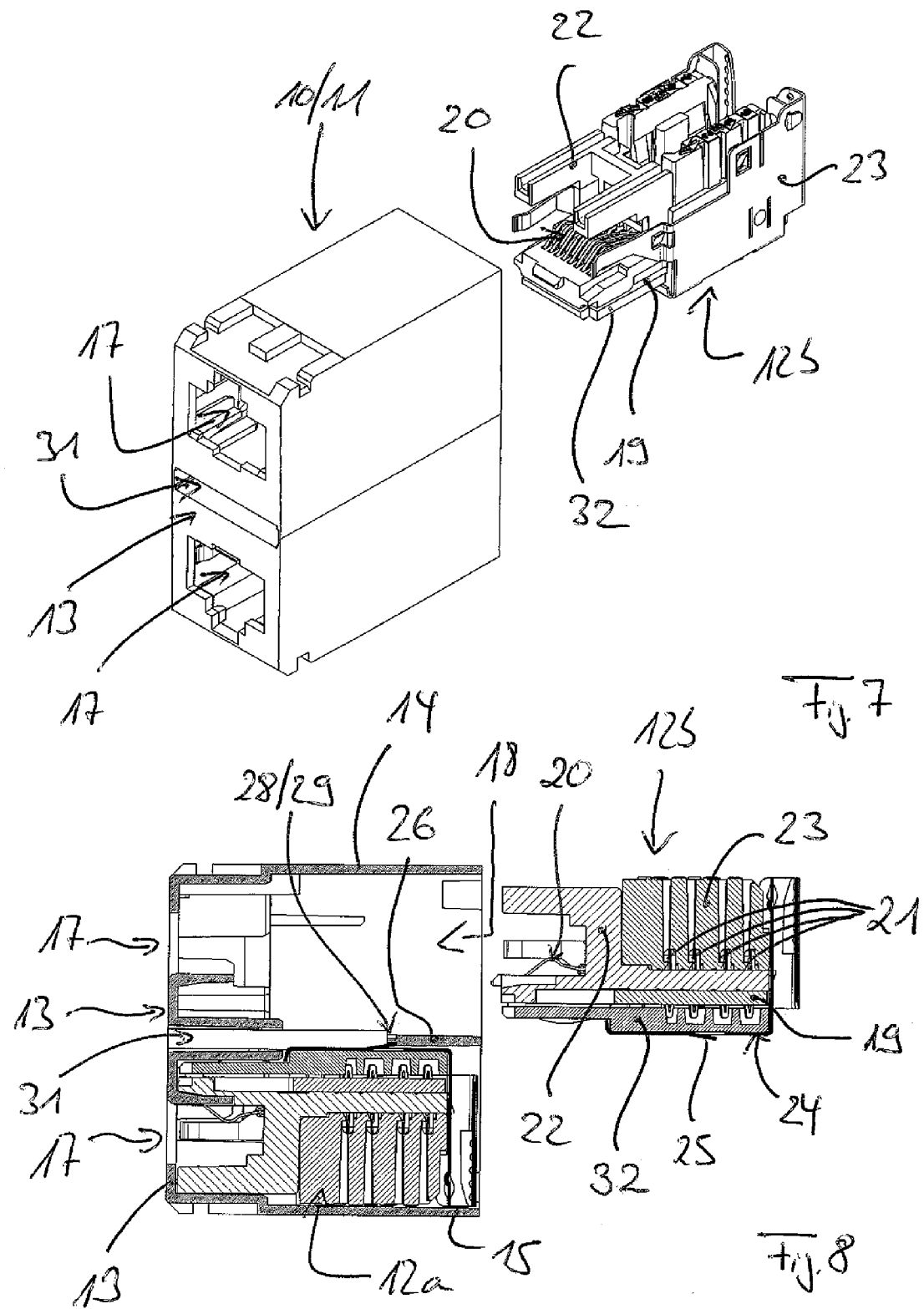
each of the connection modules (12a, 12b) can be connected with a plug connector through a respective front opening (17) of the housing (11); each of the connection modules (12a, 12b) can be inserted into or removed from the housing (11) through a respective back opening (18) of the housing (11);

the flexible protrusion (25) of the spring mechanism (24) of the first connection module (12a) is adjacent to the flexible protrusion (25) of the spring mechanism (24) of the second connection module (12b) when the both connection modules (12a, 12b) are inserted into the housing (11) so that the flexible protrusions (25) of the both connection modules (12a, 12b) can both be released by a common tool to be inserted into the housing (11) between the two connec-











EUROPEAN SEARCH REPORT

Application Number
EP 11 17 1536

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	WO 2008/154626 A2 (PANDUIT CORP [US]; WOJCIK ALAN F [US]; DUCHARME PAUL B [US]) 18 December 2008 (2008-12-18) * paragraph [0031] - paragraph [0035] * * paragraph [0039] - paragraph [0043]; figures 2,4,5,9,10,11,12 *	1-5	INV. H01R24/60
A	US 2010/248535 A1 (CHERN MICHAEL [US] ET AL) 30 September 2010 (2010-09-30) * paragraph [0024] - paragraph [0031]; figure 1 *	1-5	
A	US 2009/149043 A1 (ZHANG HONG-BO [CN]) 11 June 2009 (2009-06-11) * paragraph [0014] - paragraph [0015]; claim 1; figures 1,2 *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			H01R
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 December 2011	Examiner Bouhana, Emmanuel
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			

1
EPO FORM 1503 03/82 (P04/C01)

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

EP 11 17 1536

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.

16-12-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008154626 A2	18-12-2008	CN 101779344 A	14-07-2010
		EP 2168214 A2	31-03-2010
		JP 2010530121 A	02-09-2010
		US 2008311781 A1	18-12-2008
		WO 2008154626 A2	18-12-2008

US 2010248535 A1	30-09-2010	NONE	

US 2009149043 A1	11-06-2009	CN 201142462 Y	29-10-2008
		US 2009149043 A1	11-06-2009

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1191646 B [0002]