



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.10.2015 Bulletin 2015/41

(51) Int Cl.:
H01R 27/02 (2006.01) **H01R 25/00** (2006.01)
H01R 31/00 (2006.01) **H01R 24/62** (2011.01)
H01R 31/02 (2006.01) **H01R 24/60** (2011.01)

(21) Application number: **15161729.7**

(22) Date of filing: **30.03.2015**

(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
Designated Validation States:
MA

(71) Applicant: **A.S.A. Plastici Azienda Stampaggio Articoli Plastici S.R.L.**
20090 Trezzano Sul Maviglio, MI (IT)

(72) Inventor: **Crucitti, Rodolfo**
21100 Varese (IT)

(74) Representative: **Modiano, Micaela Nadia et al Modiano & Partners (IT)**
Via Meravigli, 16
20123 Milano (IT)

(30) Priority: **31.03.2014 IT MI20140124 U**

(54) **MULTIFUNCTIONAL MULTIPLE SOCKET**

(57) A multiple socket (1) that comprises a housing with a plurality of power sockets (10, 10a, 10b) for supplying power to electrical appliances, comprising at least one coupler element (11, 12) that integrates in a single

body a first (11a, 12a) and a second (11b, 12b) connector for low-power signals, the first (11a, 12a) and the second (11b, 12b) connector being arranged at right angles with respect to each other.

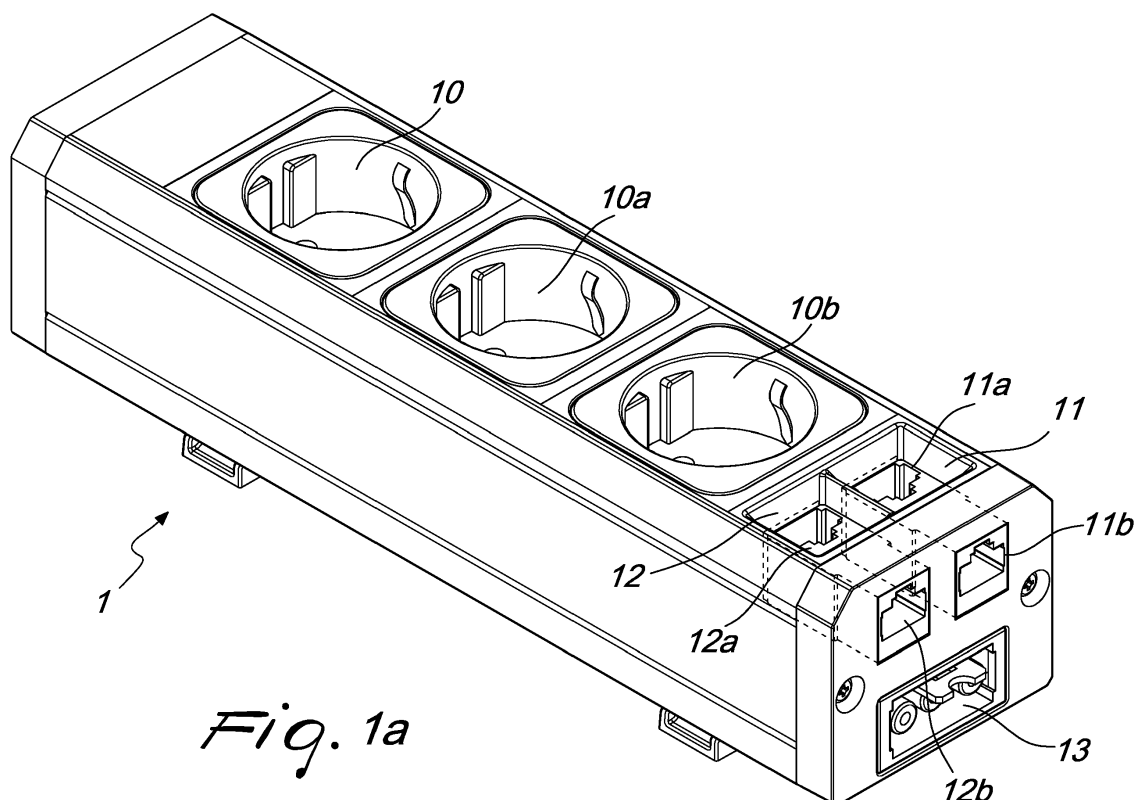


Fig. 1a

Description

[0001] The present invention relates to a multiple socket for electrical connections, in particular of the type that has both electrical sockets for electrical appliances and signal sockets for data signals and/or audio/video signals.

[0002] Multiple sockets, commonly known also as power strips, are widely-used devices that are constituted substantially by a group of electrical sockets that are powered by an electric cable connected to the mains electricity supply. Substantially, multiple sockets are used in environments in which the number of sockets is limited, making it possible to distribute energy taken from a single mains socket (for example the traditional household wall socket) to a plurality of sockets which are connected, by way of plugs, to various electrical appliances. However, given the never-ending spread of devices provided with interfaces of various types (consider for example digital cameras with USB ports or printers provided with Ethernet ports), the need became felt for multifunctional multiple sockets that make it possible to connect such devices as well. These multifunctional multiple sockets, in addition to traditional electrical sockets for electrical appliances, are also provided with "source" inputs for data signals, which can be connected to data communication lines (for example, an Ethernet network) and with second inputs (for example RJ45 ports) which are accessible to the user. The connection between the source inputs and the user-accessible inputs is provided by way of connecting cables that are incorporated in the body of the multiple socket.

[0003] However, with this configuration, the signal received by the devices has a quality that is appreciably lower than the signal taken from the communication line. This is due to the intrinsic characteristics of the connection cables, which cause a degradation of the signal, and to the fact that such cables are sensitive to external interference. Furthermore the connection cables are subject to wear and prejudice the lifetime of the multiple socket. By way of extremely careful control of the transmission quality of the signal transmitted by the cables, one can try at most to alleviate, but not resolve, part of the drawbacks that are linked to the presence of the cables. Furthermore such type of control is wasteful and is not entirely effective.

[0004] The aim of the present invention is to overcome the above mentioned drawbacks of the known art, by providing a new multifunctional multiple socket that is capable of making it possible to eliminate the signal attenuations and distortions owing to the presence of electrical cables for connection between the input and output ports of the data or audio or video signals.

[0005] A further object of the invention is to ensure the quality of the data or audio signals that are exchanged through the multiple socket.

[0006] Furthermore, an object of the invention is to increase the lifetime of the multiple socket with respect to

conventional ones.

[0007] Another object of the invention is to obtain a multiple socket that uses components that are easily sourced.

[0008] This aim and these and other objects which will become better apparent hereinafter are achieved by a multiple socket according to claim 1.

[0009] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows, illustrated by way of a non-limiting example in the accompanying drawings wherein:

Figure 1a is a perspective view of an embodiment of the multiple socket according to the present invention;

Figure 1b is a view from above of the multiple socket in Figure 1a;

Figure 1c is a side view of the multiple socket in Figure 1a;

Figure 2 shows a component of the socket in Figure 1a, in more detail.

[0010] An example structure of the multiple socket that is the subject matter of the present invention is shown in Figure 1a, which shows a multiple socket 1 that has a housing in which electrical sockets 10, 10a, 10b are inserted for electrical appliances (for example for TVs, computers, electrical household appliances etc.), signal coupler elements 11, 12, and a socket 13 for interconnection, directly or using a connection cable, with the mains electricity supply. The multiple socket shown in Figure 1a is substantially box-like, but this should not be understood to be limiting since other configurations are also possible. Furthermore the number of sockets 10, 10a, 10b, 13 and of coupler elements 11, 12, can vary within the limits of the dimensions of the housing.

[0011] The electrical sockets 10, 10a, 10b are conventional and allow the interconnection of common electrical devices provided with plugs and adapters, if any, that are compatible with the sockets 10, 10a, 10b. The sockets 10, 10a, 10b support various standards complying with the regulations and safety prescriptions of the countries in which the socket 1 according to the present invention is used. The electrical sockets 10, 10a, 10b are arranged on a side of the housing which is easily accessible to the user so as to make it easy to connect electrical devices, such as for example electrical household appliances. Such side of the housing also exhibits one end of the coupler elements 11, 12.

[0012] Each one of the coupler elements 11, 12 has a connector 11a, 12a that is preferably arranged on the same side, (first accommodation), of the housing that exhibits the electrical sockets 10, 10a, 10b, and a connector 11b, 12b that is preferably arranged on the side, (second accommodation), in which is connected the power cable connected to the socket 13.

[0013] Each one of the coupler elements 11, 12 integrates in one piece the connectors 11a, 12a and the con-

nectors 11b, 12b, so that such connectors are not connected to each other with cables, but solely by way of the same lines or conductive surfaces that receive the signal from the outside. Furthermore, each one of the coupler elements 11 and 12 is specifically adapted to forward data signals or audio/video signals (according to the type of coupler) between its inputs, and can be connected to data network communication cables or to audio or video cables.

[0014] The connectors 11a, 12a and the respective connectors 11b, 12b can be ports of the RJ45 type, therefore allowing interfacing with network cables provided with male connectors RJ45.

[0015] Alternatively, the connectors 11 a, 12a and the respective connectors 11b, 12b can be USB ports, or HDMI ports, audio sockets or other ports for low-power signals which are known in the state of the art.

[0016] In this manner and within the limits of the space requirements of the housing of the socket 1, it is possible to have additional coupler elements of various types thus making the socket 1 multifunctional.

[0017] The coupler elements 11, 12 are of the right-angle i.e. 90° type, i.e. with the axes of the respective ports of the connectors arranged substantially at right angles to each other. In other words and by way of such configuration, each one of the coupler elements 11, 12 ensures 90° connectivity between a cable connected to the connector 11b, 12b and a second cable connected to the respective connector 11a, 12a.

[0018] The coupler elements 11, 12 according to the present invention offer a 90° connectivity and comprise means that are adapted to ensure this type of connectivity during use as well, i.e. when the signal carrier cables and the devices to be powered are connected to it. The coupler elements 11, 12 are sturdy and make it possible to ensure reliable connections.

[0019] Figure 2 shows, in more detail, the coupler element 11 which in such embodiment is of the RJ45 type. The coupler element 11, as with each one of the coupler elements that are accommodated on the multiple socket 1 according to the present invention, has a boxlike body that can be inserted in the housing of the multiple socket according to the present invention.

[0020] Thus it has been shown that the described multiple socket achieves the intended aim and objects. In particular, it has been shown that the multiple socket thus conceived overcomes the qualitative limitations of the known art, by making it possible not only to distribute electric power but also to interface with a plurality of devices provided with interconnection interfaces of a varied nature without causing degradation of the quality of the transmitted signal. This is possible thanks to the innovative configuration of the socket according to the present invention which does not use connecting cables which are the cause of disturbances and alteration of the transmitted signal, but rather couplers that integrate the signal ports (data, audio or video).

[0021] Furthermore it is possible to configure the mul-

tiple socket according to the present invention so as to have one side that is better adapted to be accessible to the user and which makes it easy to connect and disconnect the apparatuses, and a second side that is capable of interfacing with the mains power cable and with data, audio or video signal cables.

[0022] Furthermore various combinations of coupler elements are possible so as to meet the requirements of the user who has devices of various types. This is particularly important in environments such as the home or in offices in which there is a limited number of wall sockets and a large number of devices to serve. Furthermore it is possible to configure the multiple socket according to the present invention so as to accommodate various sockets for supplying power to electrical appliances in addition to the socket 13, and arranging such additional sockets appropriately on the housing.

[0023] Clearly, numerous modifications are evident and can be readily executed by the person skilled in the art without extending beyond the scope of protection of the present invention. Various combinations of coupler elements are possible, for example it is possible to have a certain number of coupler elements for connecting a particular type of interface, for example USB, others for managing audio signals and others for managing specific device interfaces that are known to the person skilled in the art, as long as they are configured according to the specifications of the present invention. In this manner, a plurality of coupler elements of varied nature which are accommodated on the same multiple socket makes it possible to connect a large number of apparatuses that have different interfaces.

[0024] Hence, the scope of protection of the claims shall not be limited by the explanations or by the preferred embodiments illustrated in the description by way of examples, but rather the claims shall comprise all the patentable characteristics of novelty that reside in the invention, including all the characteristics that would be considered as equivalent by the person skilled in the art.

[0025] The disclosures in Italian Utility Model Application No. MI2014U000124 from which this application claims priority are incorporated herein by reference.

[0026] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A multiple socket (1) that comprises a housing with a plurality of power sockets (10, 10a, 10b) for supplying power to electrical appliances, **characterized in that** it comprises at least one coupler element (11, 12) that integrates in a single body a first (11a, 12a)

and a second (11b, 12b) connector for low-power signals, said first (11a, 12a) and said second (11b, 12b) connector being arranged at right angles with respect to each other.

5

2. The multiple socket (1) according to claim 1, **characterized in that** said connectors are of the power socket type.

3. The multiple socket according to claim 1 or 2, **characterized in that** said first (11a, 12a) and said second (11b, 12b) connector are ports of the RJ45 type. 10

4. The multiple socket according to claim 1 or 2, **characterized in that** said first (11a, 12a) and said second (11b, 12b) connector are ports of the USB type. 15

5. The multiple socket according to claim 1 or 2, **characterized in that** said first (11a, 12a) and said second (11b, 12b) connector are ports of the HDMI type. 20

6. The multiple socket according to claim 1 or 2, **characterized in that** said first (11a, 12a) and said second (11b, 12b) connector are sockets of the audio type. 25

30

35

40

45

50

55

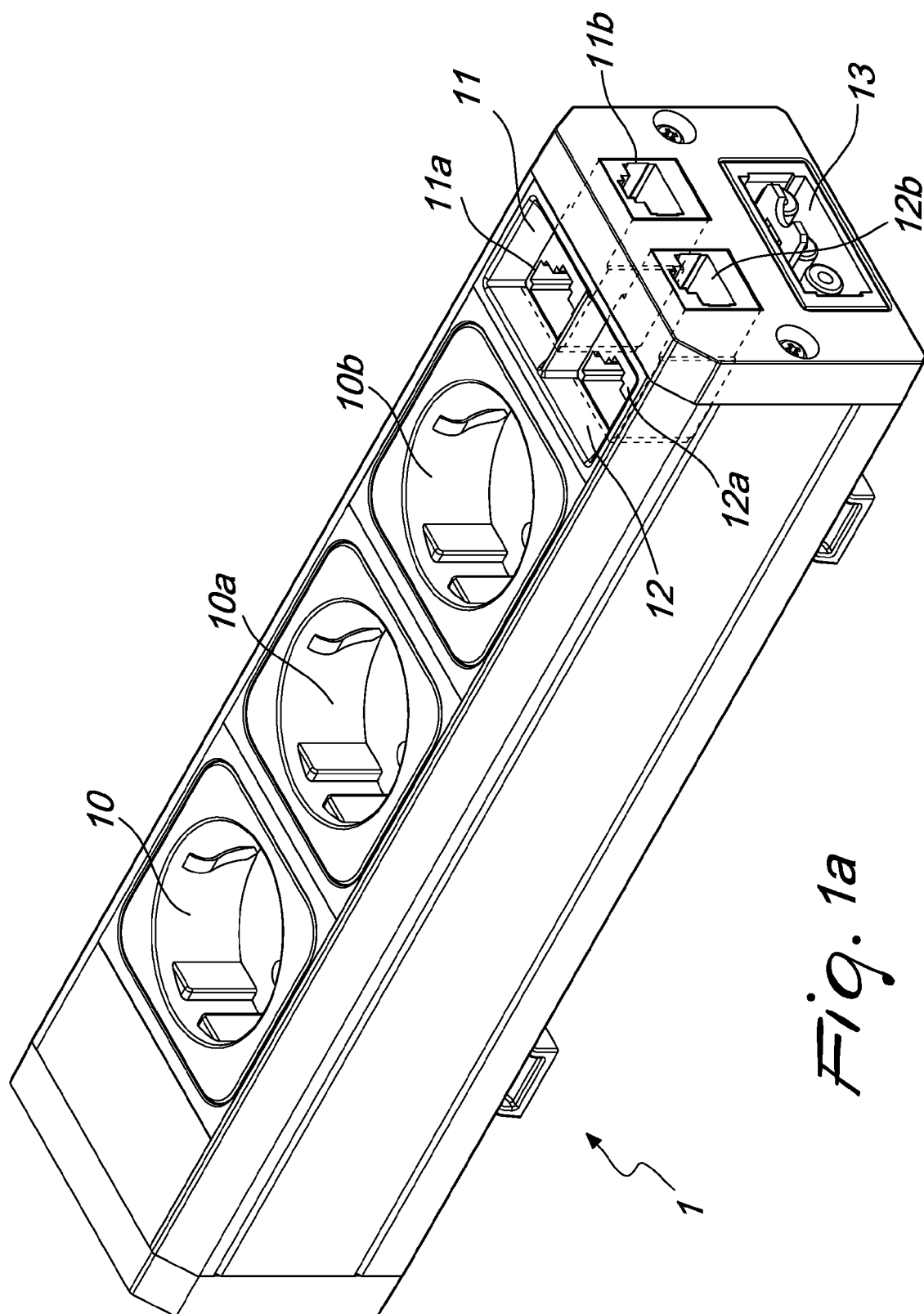
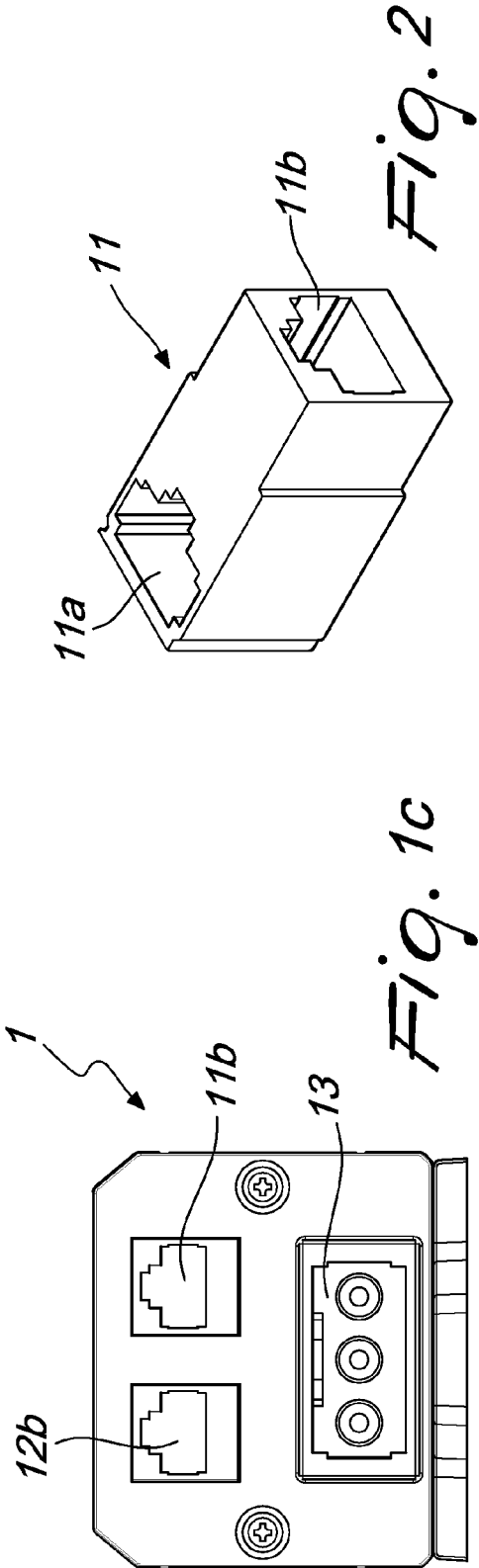
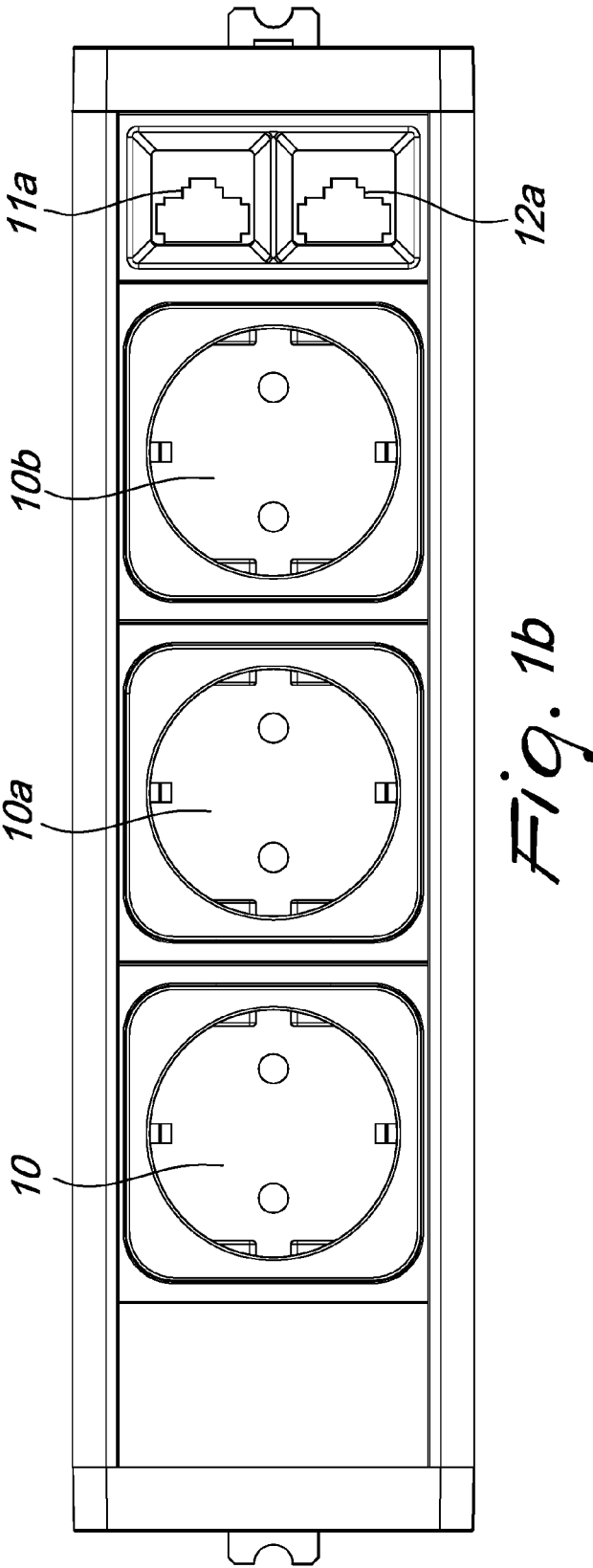


Fig. 1a





EUROPEAN SEARCH REPORT

Application Number
EP 15 16 1729

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2007 103252 A (MATSUSHITA ELECTRIC WORKS LTD) 19 April 2007 (2007-04-19) * figures 1,2 *	1-6	INV. H01R27/02 H01R25/00 H01R31/00
Y	WO 2008/088036 A1 (SUMITOMO ELECTRIC INDUSTRIES [JP]; JAPAN COMM ACCESSORIES MFG CO [JP];) 24 July 2008 (2008-07-24) * abstract *	1-6	ADD. H01R24/62 H01R31/02 H01R24/60
Y	EP 0 114 464 A1 (WESTERN ELECTRIC CO [US]) 1 August 1984 (1984-08-01) * figure 1 *	1-6	
A	US 2013/265384 A1 (SHOEMAKE MATTHEW B [US] ET AL) 10 October 2013 (2013-10-10) * figure 2A *	1-6	
			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 22 July 2015	Examiner Vautrin, Florent
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 15 16 1729

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.

22-07-2015

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2007103252	A	19-04-2007	JP 4356678 B2	04-11-2009
			JP 2007103252 A	19-04-2007
			TW 1320981 B	21-02-2010

WO 2008088036	A1	24-07-2008	CN 101617253 A	30-12-2009
			CN 201247881 Y	27-05-2009
			EP 2105770 A1	30-09-2009
			HK 1134548 A1	13-07-2012
			JP 5214149 B2	19-06-2013
			JP 2008176109 A	31-07-2008
			KR 20090104036 A	05-10-2009
			TW 200845507 A	16-11-2008
			US 2010080513 A1	01-04-2010
			WO 2008088036 A1	24-07-2008

EP 0114464	A1	01-08-1984	CA 1201193 A1	25-02-1986
			DE 3370255 D1	16-04-1987
			EP 0114464 A1	01-08-1984
			GB 2130819 A	06-06-1984
			IT 1167589 B	13-05-1987
			JP H0131271 B2	23-06-1989
			JP S59103286 A	14-06-1984
			SG 14987 G	21-04-1989
			US 4477141 A	16-10-1984

US 2013265384	A1	10-10-2013	NONE	

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

- IT MI20140124 U [0025]