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(54) Installation box for electric appliances

(57) The invention relates to an installation box for electric appliances. The box comprises a bottom (1), two opposite side walls (2), attachment means (3) projecting from the bottom and/or the sidewalls for attaching electric appliances, and engagement brackets (4, 5) at the side walls' upper edges for fastening the installation box to the rims of a trunking or some other socket frame installation opening. The installation box consists of socket modules (10), whose opposite ends are provided with

coupling means (11, 12), which establish a preformed locking with the coupling means (11, 12) of another socket module, such that the installation box is infinitely extendable by way of the socket modules (10) to a desired number of modules. The ends of the socket modules (10) can be fitted with connectors (7, 8), which are compatible with connectors (8, 7) present at the end of an adjacent socket module (10) or a cable. The assembled connectors (7, 8) are concealable with a cover plate (22).

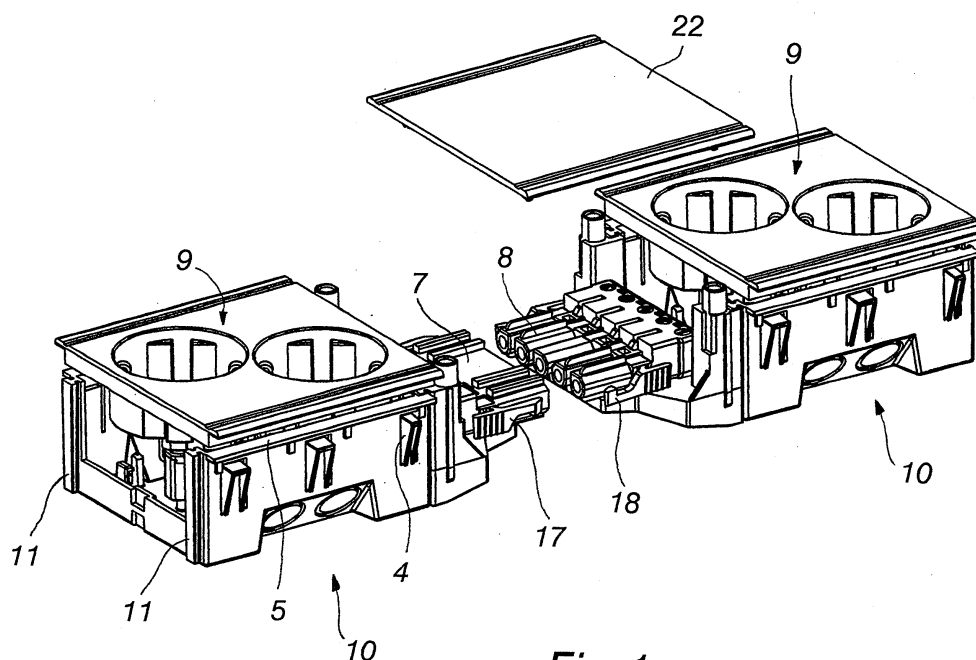


Fig. 1

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Description

[0001] The invention relates to an installation box for electric appliances, said installation box consisting of a desired number of socket modules, each socket module comprising

- a bottom;
- two opposite side walls;
- attachment means projecting from the bottom and/or the side walls for attaching electric appliances; and
- engagement brackets at the side walls' upper edges for fastening the installation box to the rims of a trunking or some other socket frame installation opening,
- first coupling means present at a first end and second coupling means present at a second end of the socket module, which establish a preformed locking with the first coupling means of another socket module, the installation box being infinitely extendable by way of socket modules.

[0002] This type of installation box is prior known from the Applicant's patent application FI-20002583. The electric appliances to be fitted in an installation box include particularly socket-outlets, but may also be switches, pushbuttons, and dimmers, used for the distribution and control of electricity in homes, offices and the like premises.

[0003] It is an object of the invention to develop this prior known installation box further in such a way that, while providing even more versatile applications therefor, it enables minimizing the amount of on-site installation work.

[0004] This object is accomplished by the invention on the basis of the characterizing features set forth in the appended claim 1. The dependent claims disclose preferred embodiments and configurations for the invention.

[0005] The invention will now be described in more detail by way of an exemplary embodiment with reference to the accompanying drawings, which illustrate the invention in a socket application and in which

Fig. 1 shows axonometrically two socket-outlets, which are connectible together both electrically and mechanically by means of connectors 7, 8 between the socket-outlets.

Fig. 2 shows axonometrically a socket frame 10 for a socket-outlet or a socket module for an installation box,

Fig. 3 is an axonometric assembly view, showing connectors included in a socket-outlet of the invention,

Fig. 4 is a plan view, showing two connected socket-outlets, with a connector area cover plate removed, and

5 Fig. 5 shows the same as fig. 4, but with a cover plate in its position.

[0006] First described is a basic principle for the socket frame or socket module 10 with reference to figs. 1 and 2. The socket frame 10 comprises a bottom 1 and two opposite side walls 2. From the bottom extend attachment means 3a, 3b for attaching an actual socket-outlet appliance along with its cover 9.

[0007] The side walls 2 have their upper edges provided with engagement brackets 4, 5 for fastening the installation box to the rims of a trunking or other socket frame installation opening. In the present case, the engagement brackets include wedge-shaped projecting lugs 4, which connect with flexible tabs 6 in the side walls 2 and establish projecting response surfaces close to the free ends of the tabs 6. The side walls 2 have their upper edges provided with flanges 5, which lie at a small distance from the response surfaces of the lugs 4. The rims of a trunking or some other socket frame installation opening are provided with an engagement formation or an engagement rail, which is engageable between the flanges 5 and the lugs 4 as a preassembled socket-outlet or socket assembly is inserted in the installation opening.

[0008] The socket frame 10 constitutes a socket module. In the embodiment of fig. 1, two socket modules are assembled together electrically and mechanically by means of connectors 7 and 8, as subsequently described in more detail. The attachment means between the socket frame 10 and the socket-outlet fixture element 9 comprise, as shown in fig. 2, semi-circular pins 3a and hook-like pillars 3b adjacent thereto, providing a snap-on connection with the engagement brackets of the socket-outlet 9 to be mounted on the socket frame 10. Alternatively, the attachment means may comprise screwfastening pillars, located adjacent to the side walls 2.

[0009] Each socket module 10 has its first end provided with first coupling means 11 and its second end with second coupling means 12 for establishing a preformed locking with the first coupling means 11 of another socket module 10. By virtue of these coupling means, the socket-outlet is infinitely extendable with the socket modules 10. Although the socket modules 10 can be attached also directly to each other, the coupling means 11, 12 are used in the present invention for securing the connectors 7 and 8 between boxes.

[0010] In the present case, the coupling means 11, 12 comprise profiled uprights at the ends of the side walls 2. The coupling means 11 at one end of the socket module 10 are constituted by T- or H-pillars 11 and the coupling means at the other end by C-pillars 12, which are dimensioned to fit around the T-top or the H-leg of the

T- or H-pillars, respectively. Naturally, other types of profiled shapes can be relevant as well.

[0011] The socket modules 10 have their ends near the bottom 1 provided with threshold-like end walls 13, 14, whose height is less than half of that of the side walls 2. The end walls 13, 14 are provided with snap-on locking means 15, 16 for locking the socket modules 10 flush with each other, in case the socket modules are coupled for a direct extension of each other. This snap-on connection must be readily disconnectable for the reuse and/or rearrangement of modules.

[0012] Fig. 3 illustrates more clearly the design of bayonet connectors. The connectors include a 5-pole female connector element 7 and a 5-pole male connector element 8, as well as mountings 7a, 8a for attaching the connector elements 7, 8 thereto. The mountings 7a, 8a are in turn attachable to the ends of the socket frame 10. The mounting 7a is provided with coupling means 11' for establishing a preformed locking with the coupling means 12 present at one end of the socket frame 10. The mounting 8a is provided with coupling means 12' for establishing a preformed locking with the coupling means 11 present at the other end of the socket frame 10. The mountings 7a and 8a have their engagement brackets 20 engageable with attachment recesses 21 in the connectors 7 and 8. The connectors 7 and 8 have their side faces provided with clasps 17 and 18 to prevent a decoupling of the coupled connectors 7 and 8. The mountings 7a and 8a are provided with locking members 16 and 15 (not visible), matching the complementary locking members 15 and 16 of the socket modules 10 to enable locking of the mountings 7a, 8a and the connectors 7, 8 at a specified height within the socket module 10.

[0013] Figs. 1 and 4 only illustrate the connectors 7 and 8 between socket-outlets. However, the opposite end of a socket-outlet with a connector 7 will receive a connector 8 and the opposite end of a socket-outlet with a connector 8 will receive a connector 7. These connectors enable connections either with an intermediate cable or with another socket-outlet. Fig. 4 visualizes that the assembled connectors 7, 8 are dimensioned to equal the length of a single socket module 10 and the connectors 7, 8 are concealable with a cover plate 22 (figs. 1 and 5) pressable securely onto fastening members 19 rising from the mountings 7a, 8a (in the present case, a mortise and tenon joint).

[0014] The connectors 7, 8 present at the opposite ends of each socket-outlet 9, 10 are linked with each other by way of cables. The 5-pole connectors 7 and 8 have three poles for three-phase linking, one pole for an 0-cable, and one pole for protective grounding.

[0015] The invention is not limited to the above-described structural embodiment of a socket-outlet and connectors. For example, the connectors 7, 8 can be made in one piece with their respective mountings 7a and 8a. The connectors 7 and 8 need not be dimensioned for a length equal to that of the socket module

10, but it can be shorter, e.g. a half of the socket module's 10 length, the cover plate 22 being respectively shorter. The releasable attachment of the connectors 7 and 8 facilitates the fabrication of components and enables a versatile application for the socket modules 10, such that the installation boxes can be optionally coupled either directly or by way of connectors as an extension of each other.

Claims

1. An installation box for electric appliances, said installation box consisting of a desired number of socket modules (10), each socket module (10) comprising

- a bottom (1);
- two opposite side walls (2);
- attachment means (3) projecting from the bottom and/or the sidewalls for attaching electric appliances; and
- engagement brackets (4, 5) at the side walls' upper edges for fastening the installation box to the rims of a trunking or some other socket frame installation opening,
- first coupling means (11) present at a first end and second coupling means (12) present at a second end of the socket module (10), which establish a preformed locking with the first coupling means (11) of another socket module (10), the installation box being infinitely extendable by way of socket modules (10),

characterized in that the socket modules (10) have their ends provided with connectors (7, 8), which are compatible with connectors (8, 7) present at the end of an adjacent socket module (10) or a cable, and that some of the connectors (7, 8) are provided with coupling means (12') to establish a preformed locking with said first coupling means (11) and some of the connectors (7, 8) are provided with coupling means (11') to establish a preformed locking with said second coupling means (12), whereby the socket modules (10) can be coupled either directly or by way of the connectors (7, 8) as an extension of each other, and that the connectors (7, 8) are provided with fastening members (19) for the attachment of a cover plate (22) concealing the area occupied by the connectors (7, 8).

2. An installation box as set forth in claim 1, **characterized in that** the connectors include a multi-pole female connector element (7) and a multi-pole male connector element (8), as well as mountings (7a, 8a), upon which the connector elements (7, 8) are mountable and which mountings (7a, 8a) are fastenable to the ends of the socket module (10).

3. An installation box as set forth in claim 2, **characterized in that** some (8a) of the mountings (7a, 8a) are provided with coupling means (12') to establish a preformed locking with first coupling means (11) present at one end of the socket module (10), and some (7a) of the mountings (7a, 8a) are provided with coupling means (11') to establish a preformed locking with second coupling means (12) present at a second end of the socket module (10).
4. An installation box as set forth in claim 2 or 3, **characterized in that** the fastening members (19) for the cover plate (22) are included in the mountings (7a, 8a).

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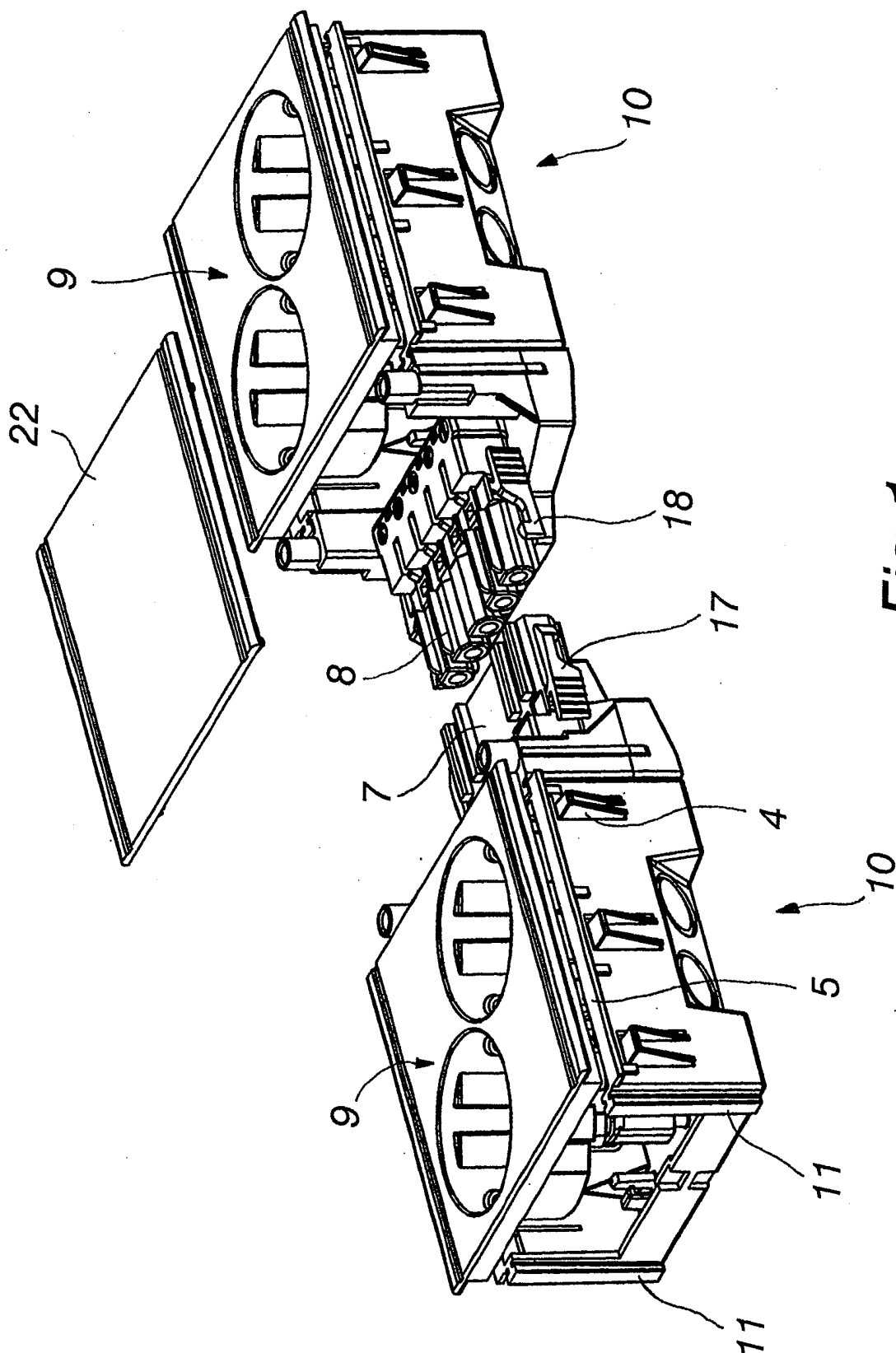


Fig. 1

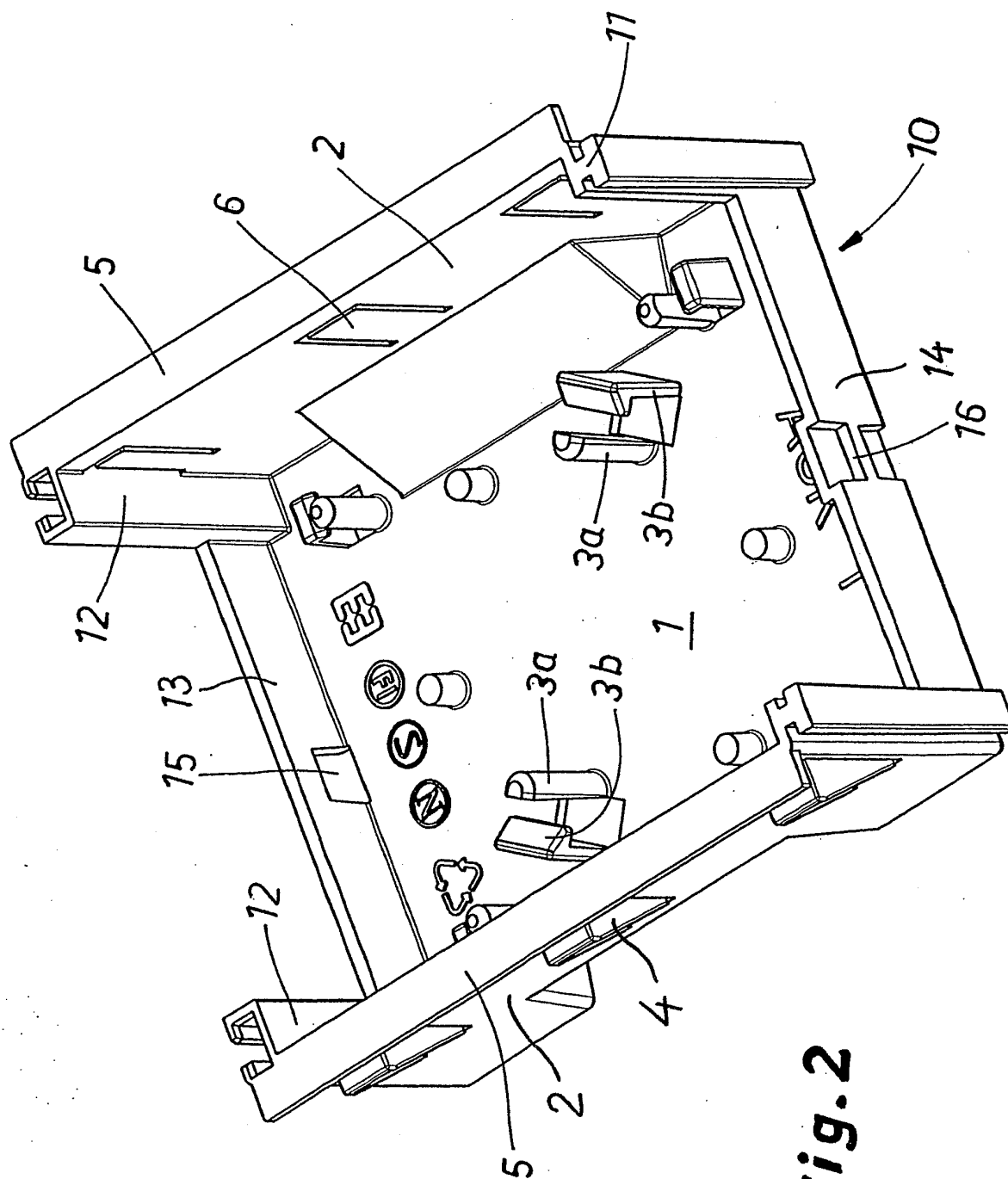


Fig. 2

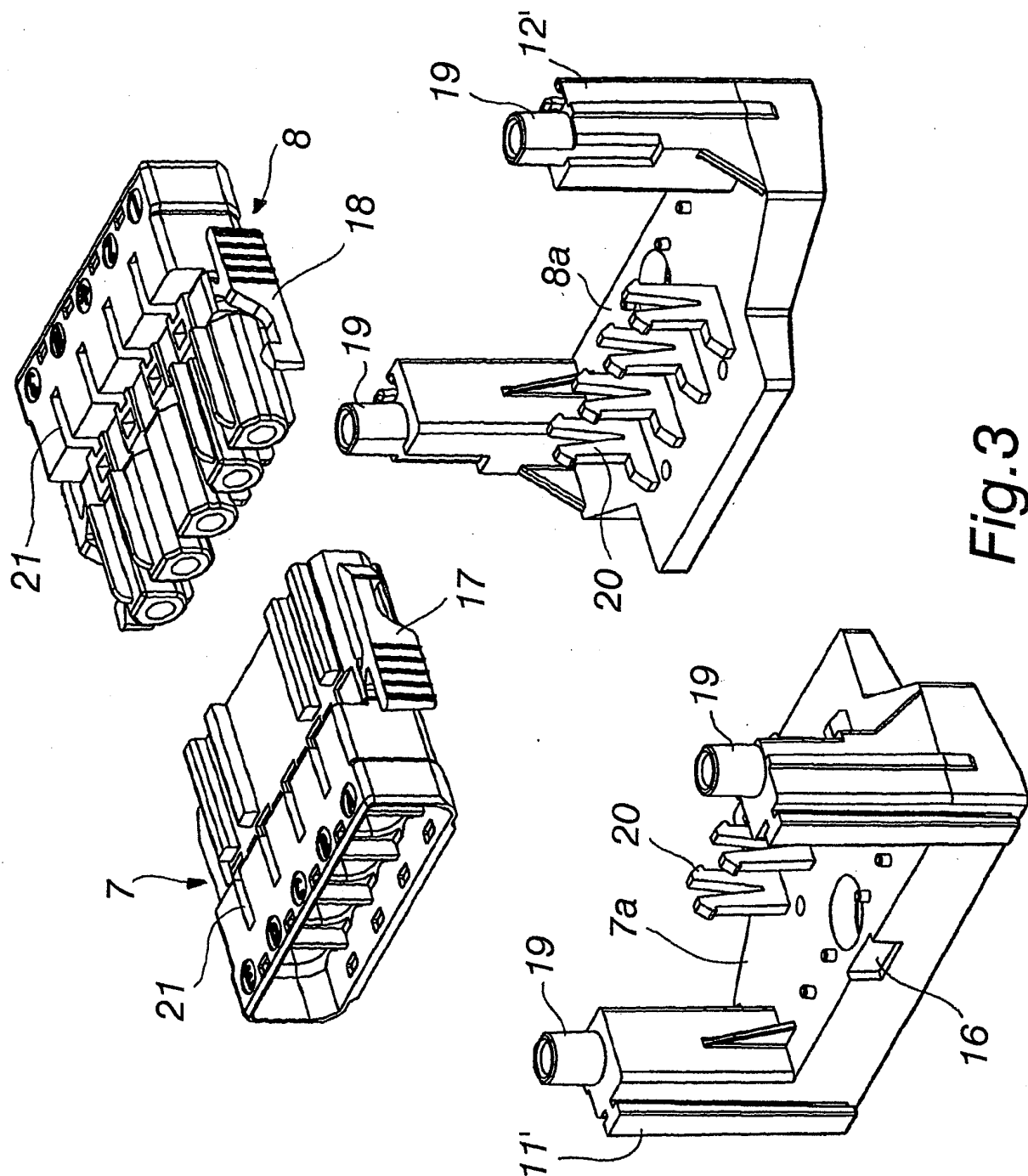
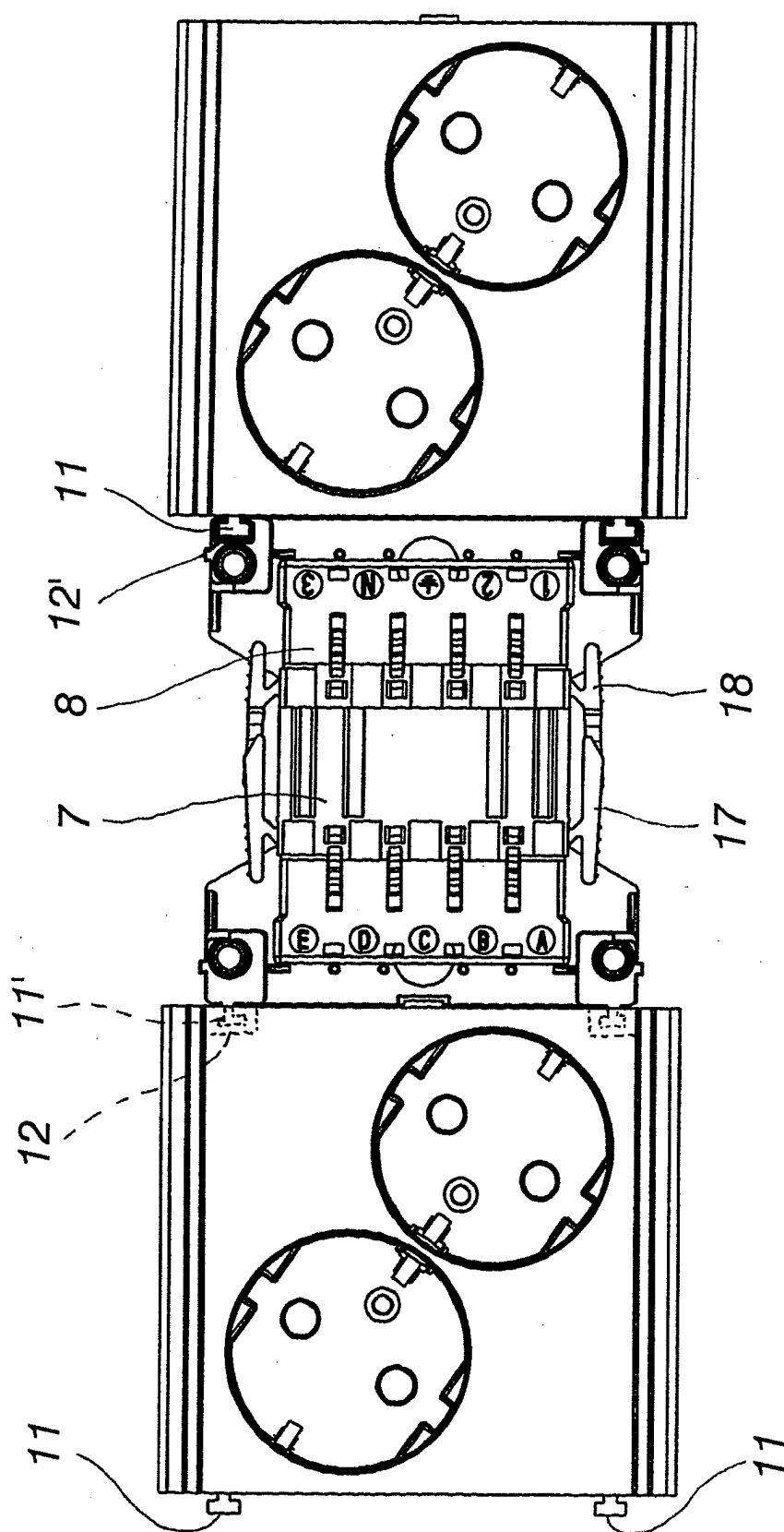


Fig. 3



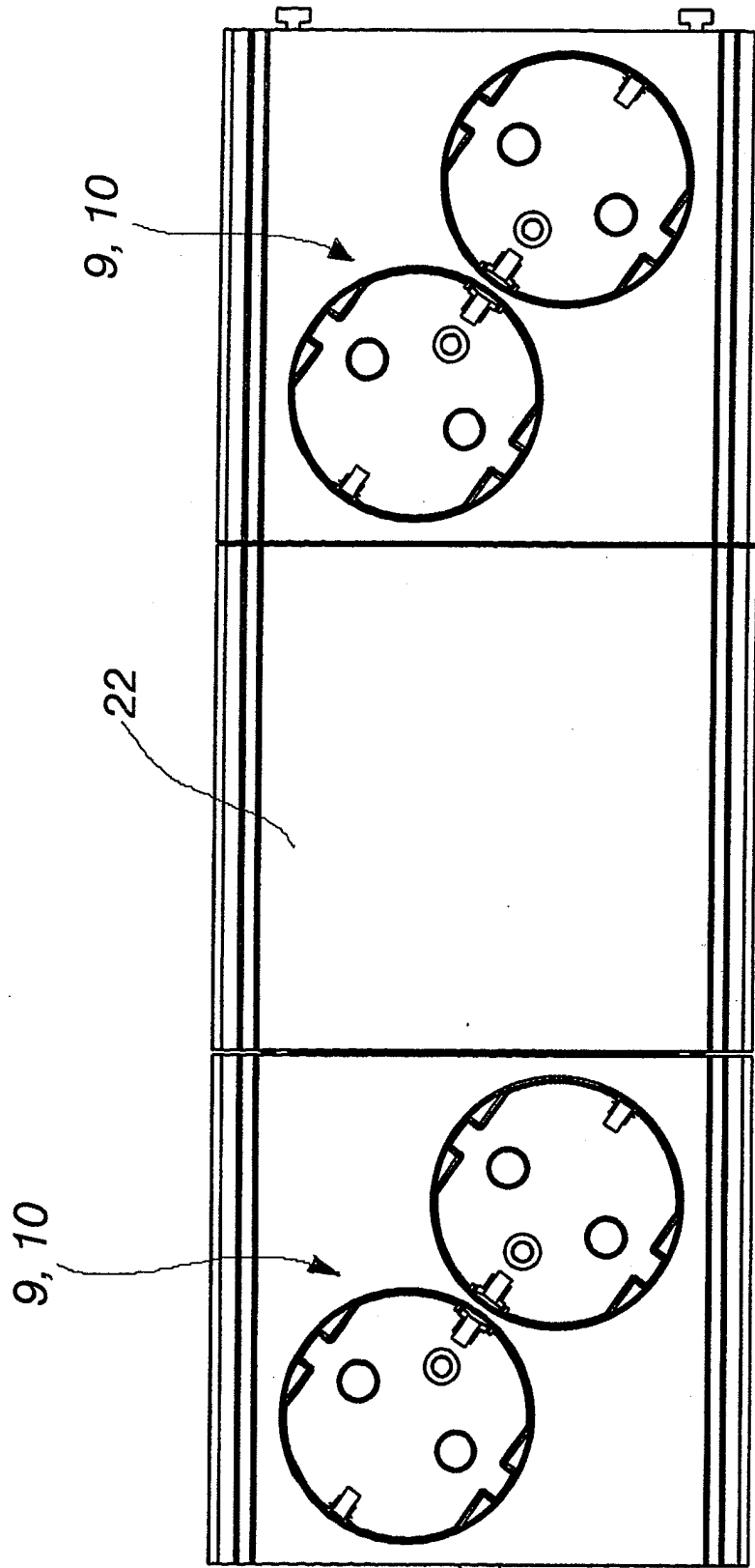


Fig.5



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EUROPEAN SEARCH REPORT

Application Number
EP 03 10 2347

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y,D	EP 1 209 785 A (ENSTO BUSCH JAEGER OY) 29 May 2002 (2002-05-29) * the whole document *	1, 4	H02G3/08 H01R9/24 H01R25/00
Y	AU 579 849 B (HPM IND PTY LTD) 15 December 1988 (1988-12-15) * figure 11 *	1-3	
Y	BE 1 013 740 A (GEEBELEN JOS; PEACH PHIL; CAMP FRANS) 2 July 2002 (2002-07-02) * figures 4,6,12 *	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H02G H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 December 2003	Examiner Salojärvi, K
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 10 2347

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
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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 1209785	A	29-05-2002	FI	20002583 A	25-05-2002
			EP	1209785 A1	29-05-2002
			NO	20015734 A	27-05-2002
AU 579849	B	15-12-1988	AU	579849 B2	15-12-1988
			AU	3850085 A	28-11-1985
BE 1013740	A	02-07-2002	BE	1013740 A3	02-07-2002

EPO FORM P0469

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