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(54) **AN ELECTRICAL MULTIPLE OUTLET MODULE, PARTICULARLY OF THE TYPE WITH INCREASED UTILITY**

(57) An electrical multiple outlet module (1), particularly of the type with increased utility, comprising a main body (2) which has a modular geometry with at least two end portions (3a, 3b) that have complementary geometries so that they can be associated by shape mating, respectively, with other end portions (3a, 3b) of at least one other electrical multiple outlet module (1); the main body (2) has a plurality of electrical outlets (4) and has at least one main plug (5) and one main outlet (6) which are formed at its end portions (3a, 3b) for the electrical connection of at least one between the other electrical multiple outlet module (1) and an electrical connector (7) for connection to the electrical mains.

Means (10) are furthermore comprised for retaining the electrical multiple outlet modules (1) in order to pre-

vent accidental separations thereof;
the retention means (10) comprise at least one first retention groove (11) which is formed at one of the end portions (3a) and at least one first retention tooth (12) which is formed at the other end portion (3b) and is designed to engage detachably the first retention groove (11);
the first retention tooth (12) is movable along a direction that is substantially perpendicular to the mating direction of the electrical multiple outlet modules (1) in contrast with and by virtue of the action of first elastic means between a locking position, in which the first retention tooth (12) can engage the first retention groove (11), and a release position, in which the first retention tooth (12) is axially offset with respect to the first retention groove (11).

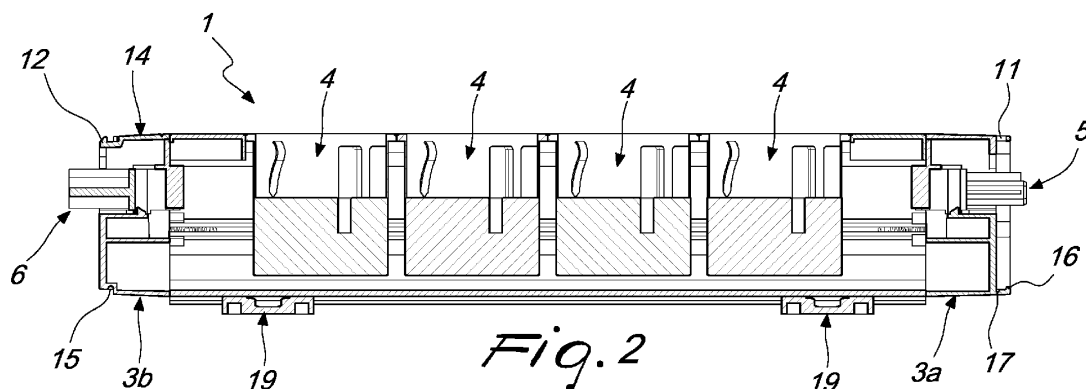


Fig. 2

Description

[0001] The present invention relates to an electrical multiple outlet module, particularly with increased utility.

[0002] In the field of the supply of electrical material, electrical multiple outlets, more commonly called electrical power strips, are known which allow to multiply the number of outlets available in a system by having a plurality of outlets supplied by a single power supply cable.

[0003] Depending on the requirements, power strips which range from two outlets up to generally half a dozen outlets are available.

[0004] Multiple outlets that have tens of outlets are more rare.

[0005] During the definition of an electrical system during the use of such system, the number of outlets necessary may no longer be clear or may in any case vary over time.

[0006] As a consequence, the systems technician is forced to supply or replace electrical multiple outlets depending on the number of devices to be connected.

[0007] This management of the electrical material leads to the need to have in store or in any case purchase a wide variety of multiple outlets, so as to meet all the possible configurations of the system.

[0008] In order to obviate this drawback, modular multiple outlets have been devised which allow, by means of the use of repeated modules, to vary the number of outlets available, extending or shortening the multiple outlet by virtue of the insertion or elimination of modules.

[0009] In this manner, the systems technician only has to worry about having in store a single reference, i.e., the single module, being able to use it and recycle it at will.

[0010] Generally, these multiple outlet modules of the known type are configured so as to be able to engage each other by means of a mechanical and electrical shape mating, so as to align the individual modules and form a single multiple outlet body.

[0011] Conveniently, in order to prevent accidental separations of the individual multiple outlet modules, retainers have been devised which consist of pins which are U-shaped so as to be able to engage two consecutive multiple outlet modules along a direction that is transverse with respect to their mating direction.

[0012] Although this solution overcomes effectively the drawback of accidental separations, on the other hand it forces the installation technician to keep in store an additional reference.

[0013] The aim of the present invention is to provide an electrical multiple outlet module that allows to obviate the drawback of accidental separations without necessarily introducing a new reference, so as to give greater utility to the electrical multiple outlet module.

[0014] Within this aim, an object of the present invention is to provide an electrical multiple outlet module that has low manufacturing costs so that it is competitive on the market.

[0015] Another object of the present invention is to pro-

vide an electrical multiple outlet module that offers the greatest assurances of reliability and functionality during its normal use.

[0016] This aim, as well as these and other objects which will become better apparent hereinafter, are achieved by an electrical multiple outlet module, particularly of the type with increased utility, comprising a main body which has a modular geometry with at least two end portions that have complementary geometries so that they can be associated by shape mating, respectively, with other end portions of at least one other electrical multiple outlet module; said main body having a plurality of electrical outlets and having at least one main plug and one main outlet which are formed at said end portions for the electrical connection of at least one between said other electrical multiple outlet module and an electrical connector for connection to the electrical mains; means being furthermore comprised for retaining said electrical multiple outlet modules in order to prevent accidental separations of said electrical multiple outlet modules; characterized in that said retention means comprise at least one first retention groove which is formed at one of said end portions and at least one first retention tooth which is formed at the other one of said two end portions and is designed to engage detachably said first retention groove; said first retention tooth being movable along a direction that is substantially perpendicular to the mating direction of said electrical multiple outlet modules in contrast with and by virtue of the action of first elastic means between a locking position, in which said first retention tooth can engage said first retention groove, and a release position, in which said first retention tooth is axially offset with respect to said first retention groove.

[0017] Further characteristics and advantages of the invention will become better apparent from the description of an embodiment of the electrical multiple outlet module, particularly of the type with increased utility, according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a plan view of an electrical multiple outlet module according to the invention;

Figure 2 is a sectional view of the module shown in Figure 1, taken along the sectional plane II-II;

Figure 3 is a perspective view of two modules such as the ones shown in the preceding figures and mated to each other;

Figure 4 is a top plan view of the two modules shown in Figure 3;

Figure 5 is a sectional view of the two modules shown in Figure 4 and taken along the sectional plane III-III; Figure 6 is an enlarged-scale detailed view of the two modules shown in Figure 5, showing the retention means;

Figures 7 and 8 are two perspective detail views showing the step of separation of the two modules shown in the preceding figures.

[0018] With particular reference to the figures, the electrical multiple outlet module, particularly of the type with increased utility, generally designated by the reference numeral 1 and hereinafter termed simply module for the sake of brevity, comprises a main body 2 which has a modular geometry with at least two end portions 3a and 3b which have geometries that are complementary so that they can be associated by shape mating respectively with other end portions 3a and 3b of at least one other module 1.

[0019] In greater detail, the main body 2 has a slender substantially parallelepiped shape with a rectangular base with a plurality of electrical outlets 4, arranged on a lateral face thereof, and at least one main plug 5 and a main outlet 6 which are formed at the end portions 3a and 3b for the electrical connection of at least one between the other electrical multiple outlet module 1 and an electrical connector 7 for connection to the electrical grid.

[0020] In greater detail, the two end portions 3a and 3b have a geometric shape that substantially has a square base, one of said end portions having an edge 8 which protrudes axially with respect to the main body 2 and the other having the same edge 9 which is recessed in an axial direction.

[0021] In other words, the two end portions 3a and 3b have mutually complementary geometries.

[0022] Conveniently, means 10 for retaining the modules 1 in order to prevent accidental separations thereof are furthermore comprised.

[0023] According to the invention, the retention means 10 comprise at least one first retention groove 11 which is formed at the end portion 3a and at least one first retention tooth 12 which is formed at the other end portion 3b and is designed to engage detachably the first retention groove 11.

[0024] With particular reference to Figure 6, the first retention groove 11 is of the through type and is formed at the protruding edge 8 of the end portion 3a.

[0025] The first retention tooth 12 instead protrudes from the recessed edge 9 of the end portion 3b and can move along a direction that is substantially perpendicular to the mating direction of the modules 1 in contrast with and by virtue of the action of first elastic means between a locking position, in which it can be engaged with the first retention groove 11, and a release position, in which it is axially offset with respect to the first retention groove 11.

[0026] Advantageously, there is a release button 14 which is associated with the first retention tooth 12 for its movement from the locking position to the release position following the intervention of an external operator.

[0027] In greater detail, the first elastic means comprise a first tab 13 made of an elastically flexible material that is interposed between the end portion 3b and the release button 14.

[0028] Conveniently, the first tab 13 can be provided monolithically with the end portion 3b.

[0029] Furthermore, the retention means 10 comprise at least one second retention groove 15 which is formed at the end portion 3b and at least one second retention tooth 16 which is formed at the other end portion 3a and is designed to engage detachably the second retention groove 15.

[0030] With particular reference to the cited figures, the second retention tooth 16 is formed at the protruding edge 8 of the end portion 3a.

[0031] The second retention tooth 16 also can move along a direction that is substantially perpendicular to the mating direction of the modules 1 in contrast with and by virtue of the action of second elastic means between a locking position, in which it can be engaged with the second retention groove 15, and a release position, in which it is axially offset with respect to the second retention groove 15.

[0032] Like the first elastic means, the second elastic means comprise a second tab 17 which is made of an elastically flexible material and is interposed between the end portion 3a and the second retention tooth 16.

[0033] Equally likewise, the second tab also is provided monolithically with the end portion 3a.

[0034] Advantageously, the elastic flexibility of the tabs of the first and second elastic means, i.e., of the two tabs 13 and 17, is increased by virtue of two notches 18 formed at the base of each tab.

[0035] Conveniently, the first retention tooth 12 and the first retention groove 11 are arranged on the main body 2 respectively diametrically opposite with respect to the second retention tooth 16 and the second retention groove 15 along the mating direction of the modules 1.

[0036] Conveniently, the main body 2 is at least partly made of plastic material at least at the two end portions 3a and 3b.

[0037] To complete the module 1 it is possible to provide fixing brackets 19 which, like for the main plug 5, a main outlet 6 and the electrical connector 7, are per se known and are therefore not described here in detail.

[0038] The operation of the electrical multiple outlet module 1 can be easily deduced from what has been described so far.

[0039] In particular, it is appropriate to point out that once the number of outlets 4 that is necessary and therefore the number of modules 1 to be associated by mating with an interlocking motion one module 1 with the other has been defined, it is possible to obtain the desired multiple outlet.

[0040] In order to provide mating it is sufficient to press one module against the other so as to cause the main plug 5 of a module 1 to be associated mechanically and electrically with the main outlet 6 of the adjacent module 1 and make the retention teeth 12 and 16 snap in the respective retention grooves 11 and 15.

[0041] If it is necessary to separate two previously mated modules 1, as shown in Figures 7 and 8, it is sufficient to act on the release button 14 so as to release the first retention groove 11 from the respective retention tooth

12 and pull axially so as to overcome the resistance offered by the second retention tooth 16 in engagement with the second retention groove 15 and make it yield elastically.

[0042] In practice it has been found that the electrical multiple outlet module according to the present invention achieves the intended aim and objects, since it prevents accidental separations of multiple mutually mated modules without the intervention of external tools.

[0043] The electrical multiple outlet module, particularly of the type with increased utility, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the accompanying claims.

[0044] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0045] The disclosures in Italian Utility Model Patent Application no. 202020000001015, from which this application claims priority, are incorporated herein by reference.

[0046] 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. An electrical multiple outlet module (1), particularly of the type with increased utility, comprising a main body (2) which has a modular geometry with at least two end portions (3a, 3b) that have complementary geometries so that they can be associated by shape mating, respectively, with other end portions (3a, 3b) of at least one other electrical multiple outlet module (1); said main body (2) having a plurality of electrical outlets (4) and having at least one main plug (5) and one main outlet (6) which are formed at said end portions (3a, 3b) for the electrical connection of at least one between said other electrical multiple outlet module (1) and an electrical connector (7) for connection to the electrical mains; means (10) being furthermore comprised for retaining said electrical multiple outlet modules (1) in order to prevent accidental separations of said electrical multiple outlet modules (1); **characterized in that** said retention means (10) comprise at least one first retention groove (11) which is formed at one of said end portions (3a) and at least one first retention tooth (12) which is formed at the other one of said two end portions (3b) and is designed to engage detachably said first retention groove (11); said first retention tooth (12) being movable along a direction that is substantially perpendicular to the mating direction of said electrical mul-

tle outlet modules (1) in contrast with and by virtue of the action of first elastic means between a locking position, in which said first retention tooth (12) can engage said first retention groove (11), and a release position, in which said first retention tooth (12) is axially offset with respect to said first retention groove (11).

2. The electrical multiple outlet module (1) according to claim 1, **characterized in that** said retention means (10) comprise at least one second retention groove (15) which is formed at one of said end portions (3b) and at least one second retention tooth (16) which is formed at the other one of said two end portions (3a) and is designed to engage detachably said second retention groove (15); said second retention tooth (16) being movable along a direction that is substantially perpendicular to the mating direction of said electrical multiple outlet modules (1) in contrast with and by virtue of the action of second elastic means between a locking position, in which said second retention tooth (16) can engage said second retention groove (15), and a release position, in which said second retention tooth (16) is axially offset with respect to said second retention groove (15).

3. The electrical multiple outlet module (1) according to claim 2, **characterized in that** said first retention tooth (12) and said first retention groove (11) are arranged on said main body (2), respectively, in a diametrically opposite manner with respect to said second retention tooth (16) and said second retention groove (15) along said mating direction of said electrical multiple outlet modules (1).

4. The electrical multiple outlet module (1) according to one or more of the preceding claims, **characterized in that** it comprises a release button (14) which is associated with said first retention tooth (12) for its movement from said locking position to said release position following the intervention of an external operator.

5. The electrical multiple outlet module (1) according to one or more of the preceding claims, **characterized in that** said first elastic means comprise a first tab (13) which is made of an elastically flexible material and is interposed between said end portion (3b) and said release button (14).

6. The electrical multiple outlet module (1) according to claim 5, **characterized in that** said first tab (13) is provided monolithically with said end portion (3b).

7. The electrical multiple outlet module (1) according to one or more of the preceding claims, **characterized in that** said second elastic means comprise a

second tab (17) that is made of an elastically flexible material and is interposed between said end portion (3a) and said second retention tooth (16).

8. The electrical multiple outlet module (1) according to claim 7, **characterized in that** said second tab (17) is provided monolithically with said end portion (3a). 5
9. The electrical multiple outlet module (1) according to one or more of the preceding claims, **characterized in that** each one of said tabs (13, 17) is provided with a notch (18) formed at the base of each one of said tabs (13, 17) so as to increase the elastic flexibility of said tabs (13, 17). 10
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10. The electrical multiple outlet module (1) according to one or more of the preceding claims, **characterized in that** said main body (2) is at least partly made of plastic material. 20

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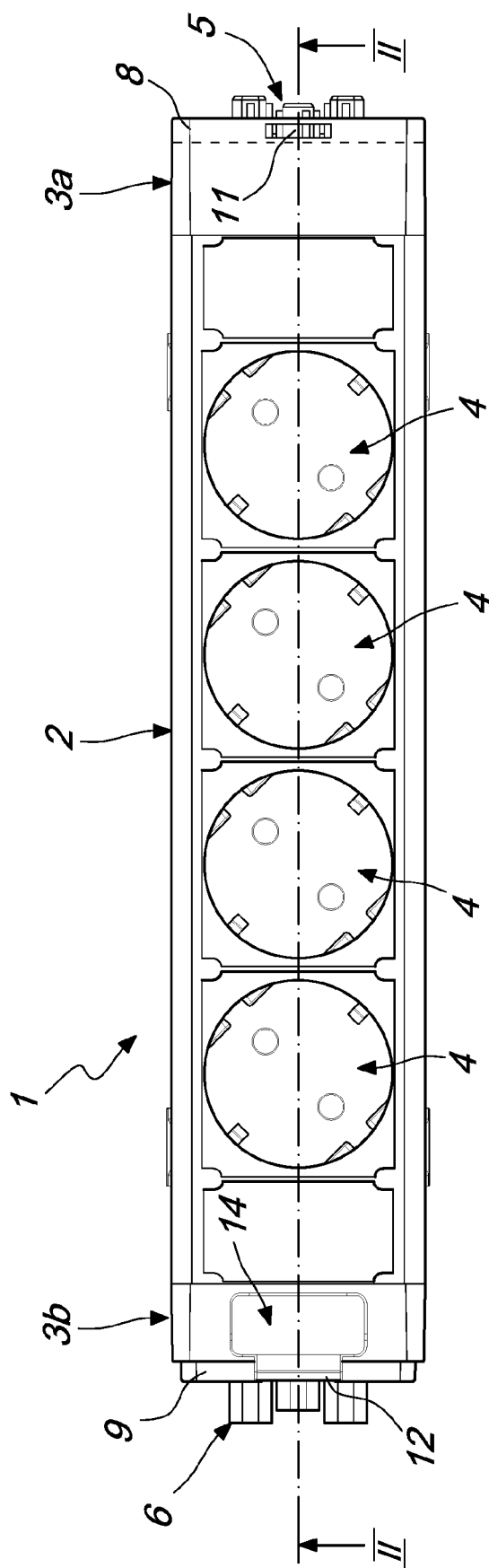


Fig. 1

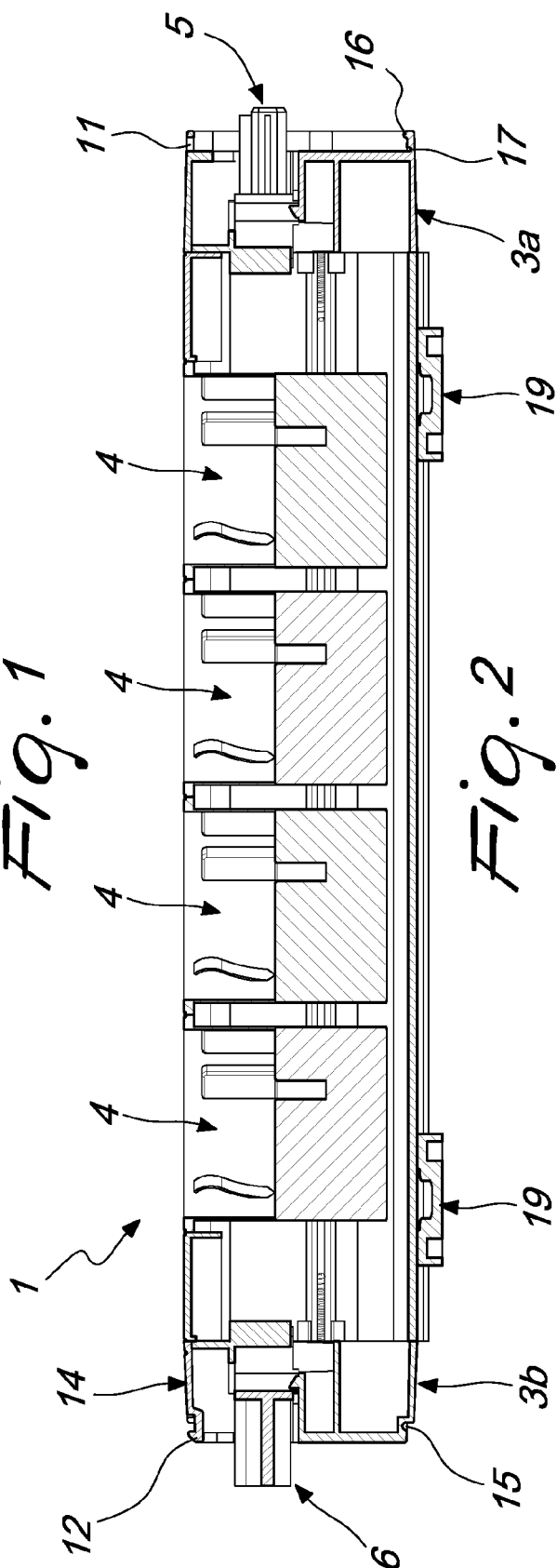
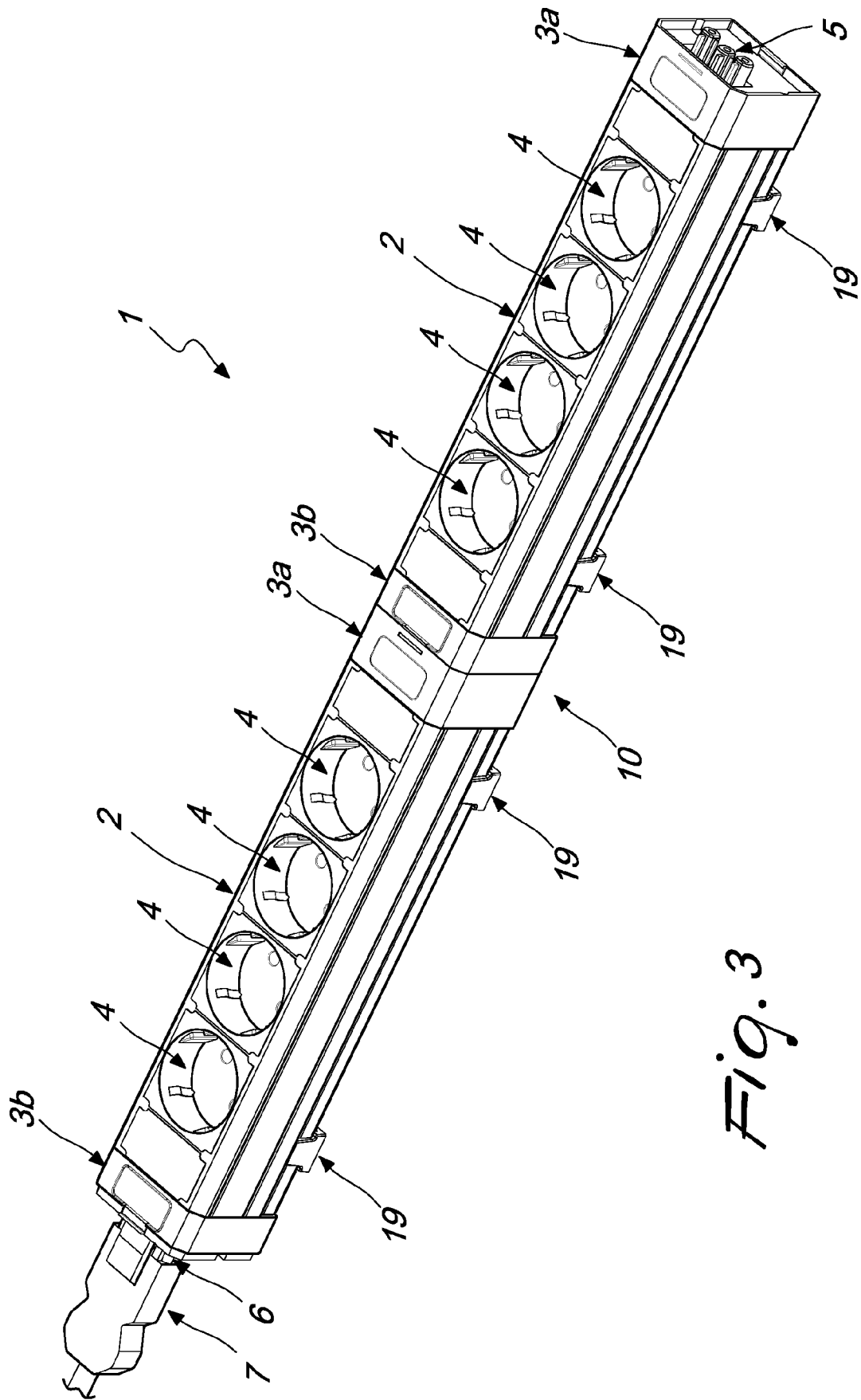
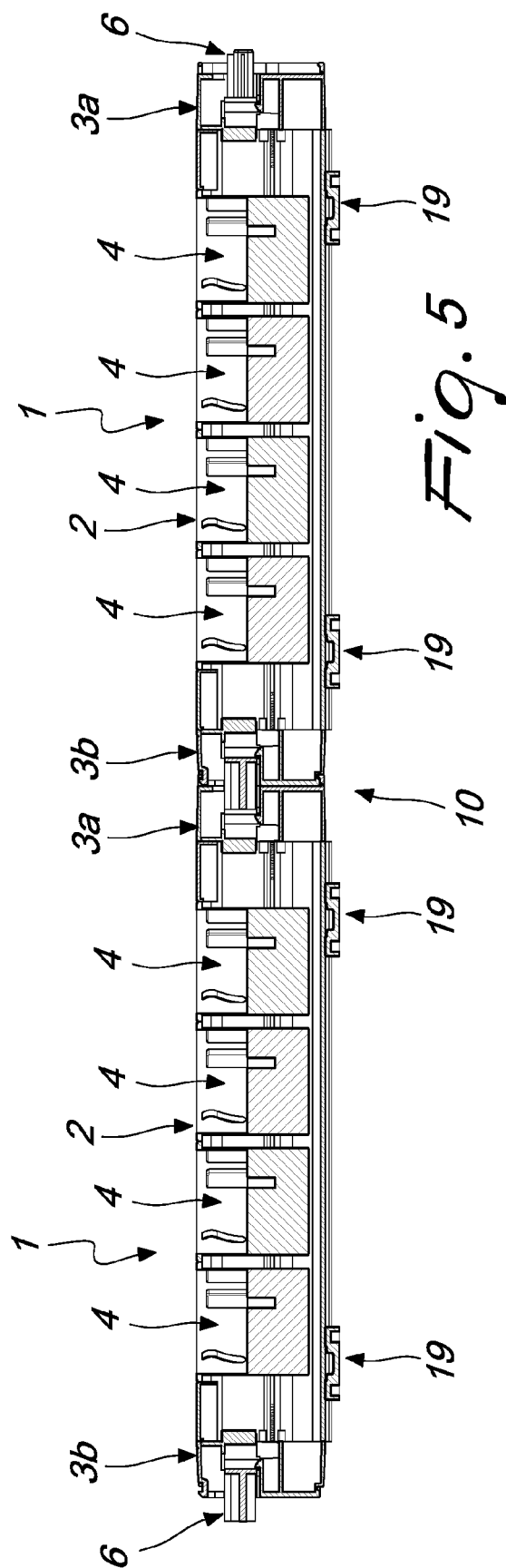
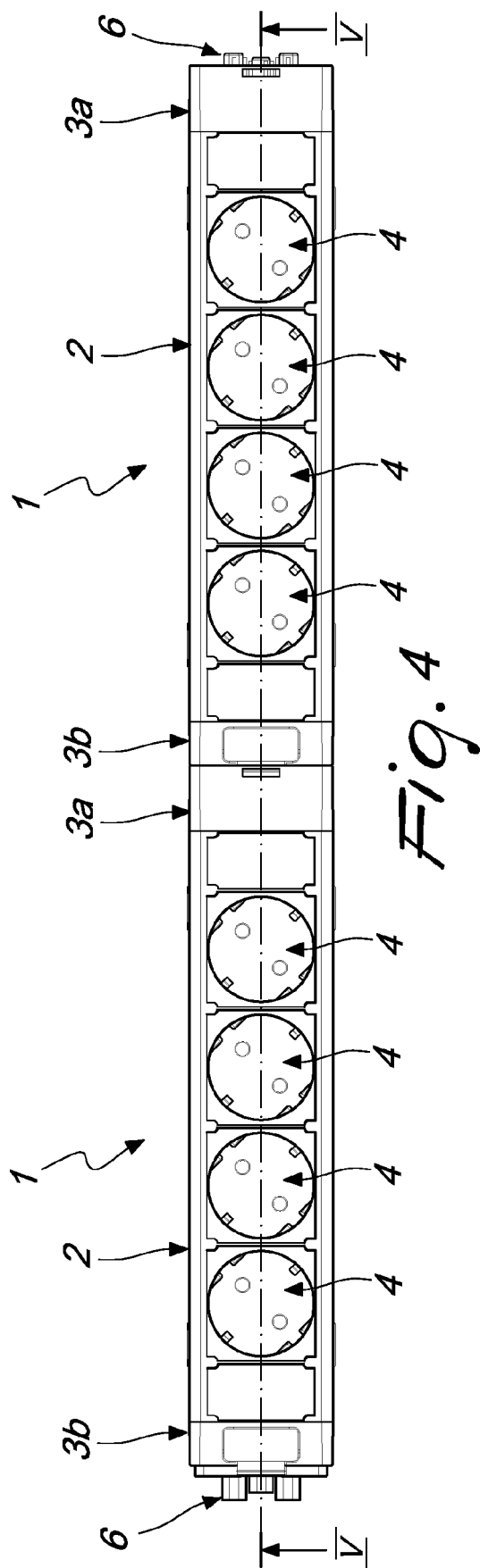


Fig. 2





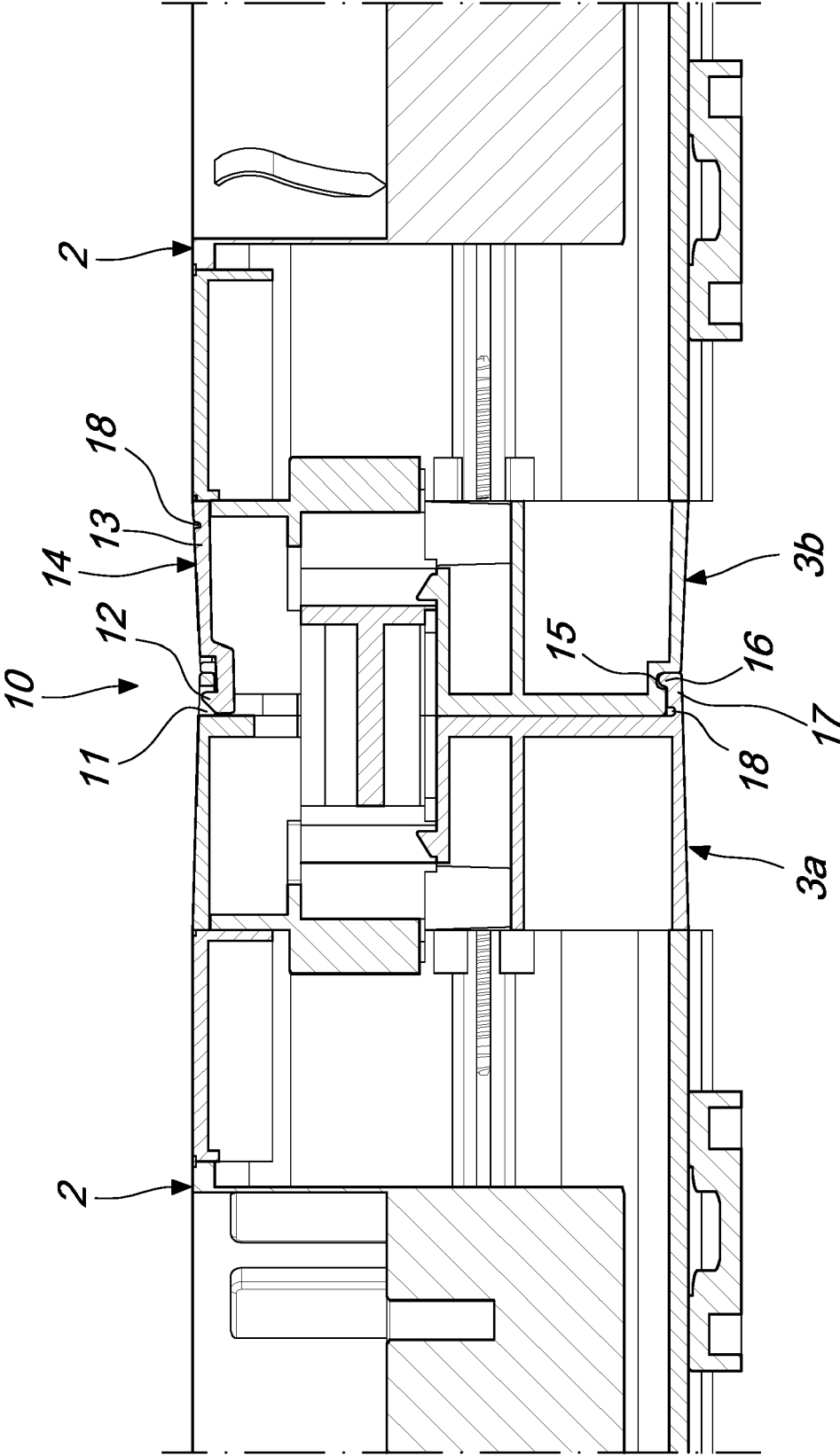
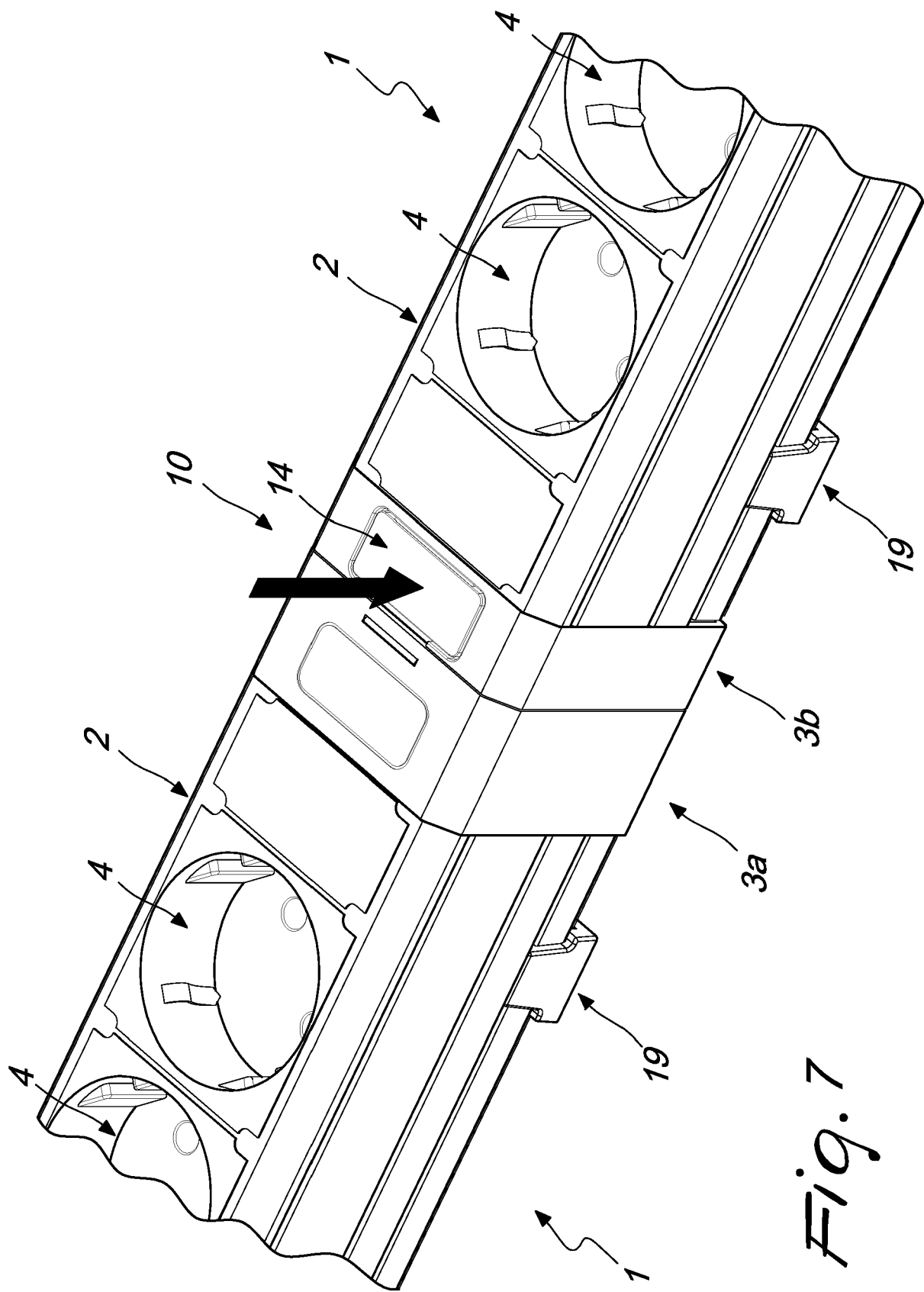


Fig. 6



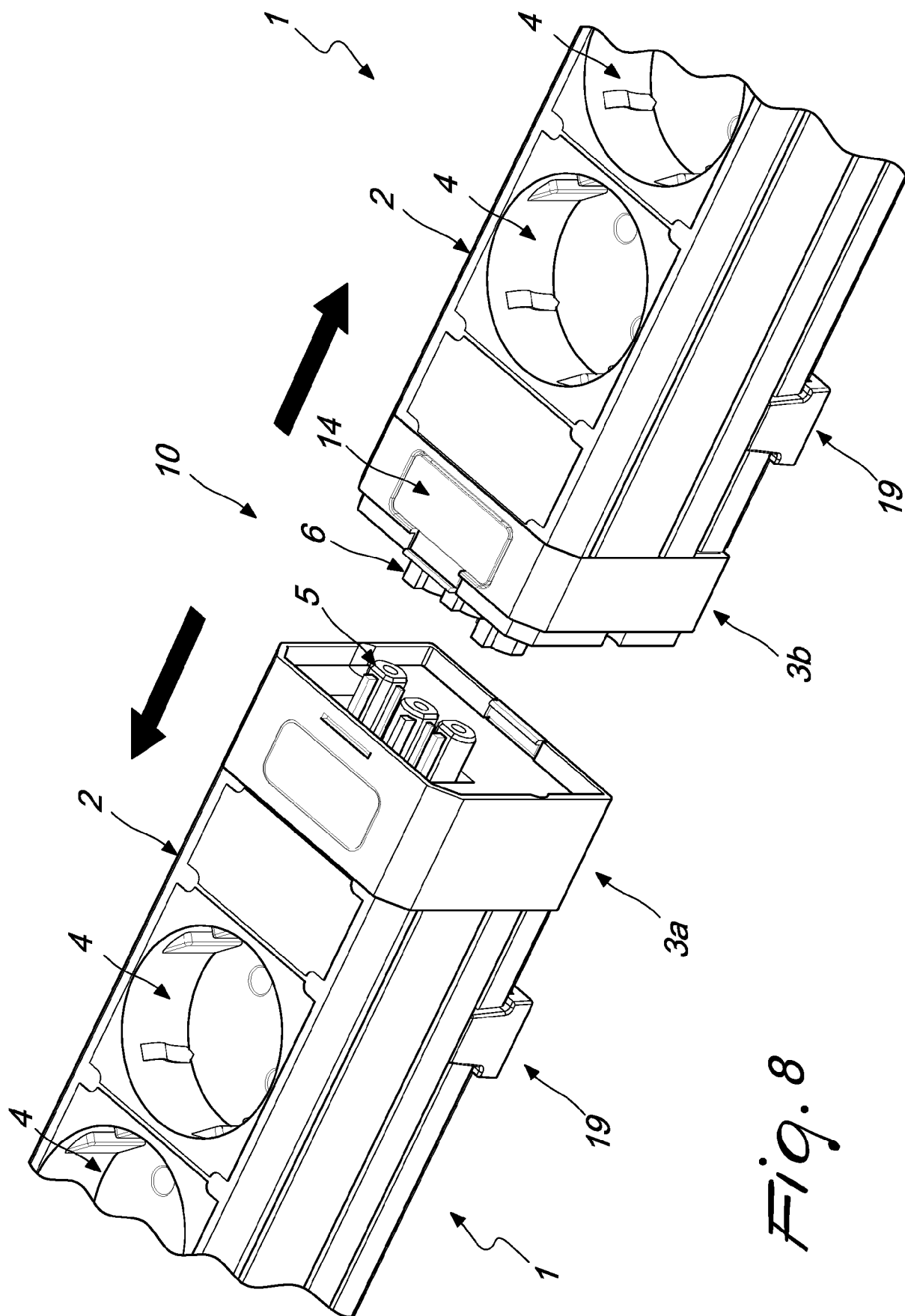


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 21 15 9891

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			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 8 July 2021	Examiner Kandyla, Maria
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 15 9891

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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08-07-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 105790015	B	21-08-2018	NONE
GB 2559588	A	15-08-2018	NONE
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REFERENCES CITED IN THE DESCRIPTION

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