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Description

I. Field of the Invention

The invention relates to a distribution cabinet which is typically set up outdoors and
5 which receives the technical, e.g. electrical or optical, distribution systems e.g. for
low voltage systems, e.g. telephone systems with associated power supply devices
and cable connection devices for a particular geographic area.

II. Background of the Invention

10 Distribution cabinets of this type besides sufficient structural stability and a sufficient
IP safety, thus tightness against rain and water spray and a resistance against
vandalism etc., have to comply with additional requirements today, for example no
excessive electromagnetic radiation must be passed to the ambient and for a use in
particular in warmer countries temperatures in the interior of the distribution cabinet
15 must not increase too far in spite of the electronic modules housed therein which
dissipate heat, but the temperature must not drop too low either.

Distribution cabinets of this type are as a matter of principle either made from metal
or from plastic material, wherein the plastic material combines the advantage of less
20 expensive production with the advantage of an electrically nonconductive material,
so that even when an electric component contacts the housing of the distribution
cabinet unintentionally, there is no risk that the respective person gets electrocuted
when the person touches the housing from the outside.

25 Since the monopoly of state telecommunication companies has been abolished in
Germany and also in other countries and different operators of networks like e.g.
telecommunication networks are operational another problem for producers of such
distribution cabinets is that various network operators specify different requirements
for these distribution cabinets for example with respect to dimensions of the
30 distribution cabinets, covering of the inner body, attachment position and shape of
the mounting frame in the interior of the inner body, ventilation options etc.

For manufacturers of distribution cabinets this generates the problem that a great number of different variants of distribution cabinets have to be developed and stored which among other things greatly increases inventory requirements and costs for tools and dies.

5

The increased inventory also includes inventory for repairs since not only parts for the external body have to be kept in stock but also inner body parts or entire inner bodies which are also often damaged during collisions with motor vehicles.

10 Thus, there is an additional problem in that damages to the inner body can typically only be repaired in that installations provided in the inner body and its mounting frame are switched off, this means the distribution cabinet is deactivated in its entirety since the mounting frame is attached at the inner body and the risk of a short circuit or electrocution thus becomes excessive.

15

Another problem besides the repair is the lateral expansion of distribution cabinets which on the one hand side shall facilitate a firm aligned lateral connection of the two distribution cabinets and on the other hand side shall work as quickly as possible like also for repairs.

20

Therefore building a pedestal under the body that is to be joined shall be avoided if possible. The document EP 1 458 073 discloses a distribution cabinet according to the preamble of claim 1.

25 **III. Description of the Invention**

a) Technical Object

Thus, it is the object of the invention to provide the distribution cabinet and in particular its body so that follow up work can be performed as quickly as possible
30 and if possible without deactivating the distribution cabinet, in particular repairs when the distribution cabinet is damaged and to also provide a respective method.

b) Solution

The object is achieved through the features of claims 1 and 10. Advantageous embodiments can be derived from the dependent claims.

By subdividing the body frame into a lower portion and an upper portion which are
5 removable from each other easily and quickly also after installation and through the attachment of the mounting frame supporting the electrical installations at the lower one of the two body frames, advantageously however not at the upper body frame, the upper body frame can be pulled off from the lower body frame after disengaging the attachment.

10

This has the advantage that damages e.g. through crashing motor vehicles which do only affect the upper body frame, and this is typically the case for lighter accidents, the repair is feasible very quickly and in particular without switching the installations in the distribution cabinet off, this means without interrupting operations of the
15 distribution cabinet in that initially the entire outer covering or only the damaged parts are removed from the upper body frame and the upper body frame is removed from the lower body frame after disconnecting the connection to the lower body frame.

Subsequently a new upper body frame is applied to the lower body frame and
20 provided with the outer body, typically a covering, or the damaged upper body frame is repaired, e.g. the individual components from which the upper body frame is made and which are damaged are replaced, thus individual frame profiles. Thereafter the repaired upper body frame can be reapplied and covered.

25 Thus typically the mounting frame extends from the lower body frame into the upper body frame and advantageously to or proximal to the upper end of the body frame, wherein the mounting frame typically protrudes from the lower body frame proximal to its rear edge.

30 The lower body frame thus typically includes less than 25% of the entire height of the body frame, in particular even less than 20% which already makes the probability of damaging only the upper body frame rather high.

The upper body frame has a base surface that is open in downward direction so that the upper body frame can be placed over the outfitted mounting frame from above and can be connected with the lower body frame which is advantageously provided only through transversal bolts which are insertable and optionally lockable.

5

This facilitates a fixation of the two frames relative to one another in the vertical direction.

10 In order not to have to lift the upper body frame over the entire height of the mounting frame after disengagement from the lower body frame which requires a considerable lifting effort when done manually, advantageously initially the most forward lowest transversal beam of the upper body frame can be removed so that a transversal beam is provided at the front side only along the upper edge.

15 Advantageously at least the forward lowest horizontal strut or horizontal beam can be dismantled in the upper body frame and replaced individually without dismantling the rest of the upper body frame wherein advantageously each beam of the upper body frame has to be dismantled individually without dismantling the rest.

20 Thus, it is sufficient to subsequently lift the upper body frame only far enough so that it comes vertically out of engagement from its supports at the lower body frame and to move the upper body frame backward thereafter and thus pull it off from the rest of the distribution cabinet, thus the outfitted mounting frame and the lower mounting frame.

25 In the two horizontal directions there is a form locking connection in that the upper body frame includes frame profiles freely protruding in downward direction, for example a cuboid frame with frame profiles extending along the edges, wherein the vertical profiles extend beyond the lower corners in downward direction and the free ends of the vertical profiles extend in downward direction laterally adjacent to the

30 sides of the lower body frame, thus advantageously in supports that are configured at this location wherein the supports fixate the free ends in a form locking manner in both horizontal directions. Thus, the upper body frame includes vertical beams which extend laterally adjacent to the lower body frame in inserted condition and which are connected with vertical beams of the lower body frame.

For this purpose at least the vertical edges of the cuboid lower body frame are not made from the same body profiles as the rest of the frame or they are at least not only made from these body profiles but they are supplemented with or replaced by sheet metal components that are configured as supports.

Advantageously the side elements of the lower body frame are made from a sheet metal part that is U-shaped in a side view or that is shaped as a frame whose freely protruding upward arms are bent to form a support into which the free ends of the upper body frame are insertable and fixable therein, wherein the transversal arm typically rests down below on the pedestal and can also be firmly connected therewith.

The fixation of the upper body frame relative to the lower body frame is provided through inserting locking rods, wherein the same rods can be used which are used as hinge axes for the doors of the body in that a rod of this type is cut to the depth of the cabinet and pushed through from the front to the rear and thus extends through openings in the upper body frame and also in the lower body frame.

The openings in the lower body frame are thus provided in the outer supports which are applied in the lower portion of the vertical struts of the upper body frame anyhow for fixating the outer covering. Thus the pass through openings in the lower body frame are thus aligned in the respective arms of the supports for the upper body frame, in particular in the lateral frames.

This on the one hand side does not yield any additional material consumption through additional application of supports at the vertical typical frame profiles and in particular this U shaped side piece after disengaging the connection with the remaining profile frame can also be removed in outfitted condition of the distribution cabinet after removing the outer covering and optionally lifting the upper body frame for example through pulling out at a downward slant angle in case a provisional support is provided between the mounting frame with the installations until a new side element is mounted and fixated.

In the same way also individual frame profiles of the lower body frame from the distribution cabinet can be replaced wherein the respective cover elements of the lower body frame are removed in case the lower body frame was damaged as well.

- 5 In particular also the entire lower body frame can be replaced and thus advantageously without deactivating the installations at the mounting frame or even dismounting them.

10 However, since the lower mounting frame supports the mounting sub frame which is typically made from plural mounting panels that stand adjacent to one another and which are stiffened relative to one another at least in the upper portion during the insertion time of the lower body frame the mounting sub frame or the individual mounting panels have to be stabilized.

- 15 Since this support in the lower portion would provisionally impede the dismounting and mounting of the lower body frame it is proposed according to the invention that the individual mounting panels or the entire mounting panel which for this purpose have to be certainly provided sufficiently stable also in outfitted condition have to have support points in the upper portion in order to be suspended at a mounting
20 yoke that is provisionally configured above the distribution cabinet until the lower mounting frame or its damaged components have been replaced.

When the damages are strong enough so that the installations are damaged or destroyed anyhow they have to be dismounted anyhow.

25

- Since the free ends of the vertical struts of the upper body frame advantageously extend over the entire length of the vertical struts of the lower body frame adjacent to the lower body frame they are supported in a form locking manner at their entire length relative to one another which provides a high level of mechanical connection
30 stiffness and load bearing capability in spite of simple insertion and locking in the supports of the lower body frame.

Thus, the lower body frame like for most distribution cabinets sits on a pedestal which in turn includes a pedestal box and a pedestal base which provide required stand safety to the body frame.

- 5 When the respective distribution cabinet requires electromagnetic sealing, shielding plates are attached at the upper body frame, in particular at its outsides, however only down to the lower horizontal profiles and only in exceptional cases to the lower free ends of the vertical profiles. Advantageously the outer body includes at least one door that is linked at the upper body frame and which advantageously extends
10 only over the elevation range between the upper and lower horizontal struts of the upper body frame.

The individual elements of the body frames, advantageously of the lower and also of the upper body frame are connected with one another in a disengageable manner
15 over the same connection elements, advantageously cube connectors in the outer corners, wherein the cube connectors are configured so that profile rods between two such connection elements can be disengaged and replaced for example without having to remove the adjacent cover plates in advance.

20 Thus, a kit is provided for two piece body frames which includes the following components:

- Frame profiles,
- Cube connectors,
- Sliders for undercut grooves of the frame profiles for direct connection of
25 frame profiles with one another,
- Supports for use at the lower profile frame for the upper profile frame, in particular configured as complete side elements for the lower profile frame
- Attachment elements in particular lockable studs for connecting the upper profile frame with the lower profile frame.

30

c) Embodiments

Embodiments according to the invention are subsequently described in an exemplary manner with reference to drawing figures, wherein:

FIG. 1 illustrates a distribution cabinet on a pedestal without outer cover and without installations;

FIG. 2 illustrates the distribution cabinet of FIG. 1 with slightly raised upper body frame attachment;

FIG. 3 illustrates the distribution cabinet with almost completely pulled off upper body frame; and

FIG. 4 illustrates the distribution cabinet without upper body frame.

FIG. 1 illustrates a distribution cabinet according to the invention, however without the outer body configured as a covering and without installations which are typically provided in an interior of the inner element 21 and there in particular at the mounting frame 6 and which are connected with cables that are run out of the underground and not visible.

The inner body 21 is a frame including frame profiles 7 which extend along the outer edges of the vertical square inner body 21 and which additionally also includes horizontal and vertical struts there between.

The entire inner body 21 rests on a pedestal 2 including a pedestal base including a metal structure which is partially embedded in the ground and a pedestal box 2a externally enveloping the pedestal above ground level wherein the pedestal box is typically made from plastic material.

The inner body 21 which is placed in the prior art as a unit onto the pedestal 2 and which is firmly connected with the pedestal 2 is provided in the prior art also as a body frame 16 with frame profiles 7 along at least the outer edges of the upright cuboid inner body 21 whose surfaces are covered and closed by cover plates 13 as required in order to provide electromagnetic tightness for the housing.

In the instant case the body frame 16 is provided in two pieces which a lower body frame 16a and an upper body frame 16b whose extension is apparent from FIGs. 2 and 3.

- 5 The lower body frame 16a which is only visible in FIG. 4 includes approximately 20% of the height of the entire body frame 16 and has a base surface that is slightly smaller than the pedestal box 2a, so that the covering which is subsequently applied to an outside of the body frame 16 at a distance and which forms the outer body 22 is vertically aligned with the pedestal case 2a arranged thereunder.

10

The lower body frame 16a is in turn cuboid with a horizontally extending frame profiles 7 and vertically extending transversal struts there between made from such frame profile 7 depending on size, whereas the sides are made from rectangular extending or also U shaped upward open side frame 18 which are made from
15 advantageously elbowed plates.

20

The elbow is necessary so that the vertical arms of the side frames 18 have sheet metal surfaces extending in top view in longitudinal direction and also in transversal direction of the distribution cabinet 1, wherein the arms form an angle which is for
20 example open at a slant angle towards the outside for example from the base surface of the distribution cabinet.

25

The vertically oriented sheet metal angles are used as supports 15 in order to receive the freely downward terminating ends of the vertical frame profiles 7 of the
25 upper body frame 16b therein and in order to support the ends in both horizontal directions since the ends of the vertical frame profile 7 are supported relative to one another through the horizontally extending frame profiles of the other body frame 16b at a distance so that they fit precisely in the supports 15 of the lower body frame 16a.

30

The upper body frame 16b is in turn cuboid, approximately with the same base surface as the lower body frame 16a, wherein the vertical frame profiles of the upper body frame 16b are extended downward beyond the lower edge of the cuboid so that they reach downward to the lower transversal arm of the lateral frame 18 of the lower

body frame 16a or even contact the lower body frame and thus extend in the downward direction outside of the lower body frame.

After locking through simple insertion bolts at the lower body frame 16a possibly with
5 an additional interlocking the upper body frame 16b cannot be pulled off in upward direction any more since the entire body frame 16 then forms a solid unit.

As illustrated in FIGs. 1 – 3 the upper body frame is covered with cover plates 13 at
10 a top side and at a back side and at the side surfaces but it rests down to its lower horizontal struts as illustrated in FIG. 1 in applied condition slightly above the upper horizontal strut of the lower body frame 16a or it sits on the upper horizontal strut.

FIG. 4 furthermore illustrates best that the mounting frame 6 at which the largest
15 portion of the subsequent electrical installation is mounted protrudes vertically upward from the inner surface of the lower body frame 16a, advantageously proximal to its rear edge and that it has a height so that it reaches in applied condition proximal to the lower end of the upper body frame 16b, this means it utilizes its interior to the largest extent possible.

20 Thus, the interior of the distribution cabinet 1 that is mounted at this mounting frame 6 can remain mounted and operational even when the upper body frame, advantageously after removing the outer covering as illustrated in FIG. 1 – 3, is disengaged from its connection with the lower body frame 16a and raised or completely pulled off in upward direction in order to repair or completely replace the
25 upper body frame.

Even individual body components of the lower body frame 16a can then be replaced without having to switch off installations or dismounting them wherein eventually a
30 provisional mechanical support of the remaining body frame 16 has to be established for the time period during which the component is replaced.

Reference Numerals and Designations

	1	distribution cabinet
	2	pedestal
5	2a	pedestal box
	2b	pedestal base
	3	body
	4 a, b	door
	6	mounting frame
10	7	frame profile
	11	rear wall
	12	line up element
	13	shielding plate
	14	exterior support
15	15	support
	16a	upper body frame
	16b	lower body frame
	18	side frame
	19	sleeve element
20	21	inner body
	22	outer body

P a t e n t k r a v

1. Fordelerskab (1) med et korpus, omfattende

- et indvendigt korpus (21) i form af en korpusramme (16) af metal og eventuelt en afdækning med skærmlader (13) og

- et udvendigt korpus (22), især i form af en afstandsaafdækning af det indvendige korpus (21), hvilken afstandsaafdækning fortrinsvis består af kunststof, og

- et monteringsstel (6) til fastgørelse af de indvendige dele, hvilket monteringsstel er fastgjort på det indvendige korpus (21),

kendetegnet ved, at

- det indvendige korpus (21) omfatter en nedre korpusramme (16a) og en øvre korpusramme (16b), som er forbundet løsbart med hinanden, og

- monteringsstellet (6) er fastgjort på den nedre korpusramme (16a).

2. Fordelerskab ifølge krav 1,

kendetegnet ved, at

monteringsstellet (6) rager ud fra den nedre korpusramme (16a) ind i den øvre korpusramme (16b), når den øvre korpusramme (16b) er færdigmonteret.

3. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

den øvre korpusramme (16b) er åben forneden og kan indsættes over monteringsstellet (6), som er udstyret med indbyggede dele.

4. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

den øvre korpusramme (16a) omfatter vertikale stykker, som i indsat tilstand forløber i siden ved siden af den nedre korpusramme (16a) og er forbundet med dennes vertikale stykker.

5. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

i det mindste det forreste nederste horisontale stykke, især alle stykker, ved

den øvre korpusramme (16a) kan afmonteres og kan udskiftes enkeltvis uden at afmontere resten af den øvre korpusramme (16a).

6. Fordelerskab ifølge et af de foregående krav,

5 **kendetegnet ved, at**

de vertikale stykker af den nedre korpusramme (16a) har føringer til de frie ender af de vertikale stykker af den øvre korpusramme (16b), hvilke fører disse formluttende i mindst en horisontal tværretning, og låseelementer, som låser de to rammer vertikalt i forhold til hinanden.

10

7. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

de vertikale rammedele ved den nedre korpusramme (16a) er suppleret eller udskiftet med føringer (15) til den øvre korpusramme (16a), og især den ned-

15

8. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

monteringsstellet (6) i nærheden af bagkanten af den nedre korpusramme (16a) rager frem fra dennes indvendige flade og rager frem til dennes øvre ende, når den øvre korpusramme (16b) er indsat.

20

9. Fordelerskab ifølge et af de foregående krav,

kendetegnet ved, at

der forefindes mindst et forbindelseselement (12), ved hjælp af hvilket det indvendige korpus (21) er fast forbundet med et yderligere indvendigt korpus (21), hvor forbindelseselementet (12) strækker sig over hele højden af den øvre korpusramme (16b).

25

30

10. Fremgangsmåde til reparation af et i det øvre område beskadiget korpus af et fordelerskab ifølge krav 1, hvorved

- det udvendige korpus (22) fjernes fra det indvendige korpus (21),

- forbindelsen af den øvre korpusramme (16b) løsnes fra den nedre korpusramme (16a),

35

- den øvre korpusramme (16b) trækkes af opad og/eller bagud over montage-
gestellet (6) og de indbyggede dele,
- de defekte dele af den øvre korpusramme (16b) udskiftes, eller denne ud-
skiftes komplet, herunder især skærmladerne (13),
- 5 - den øvre korpusramme (16b) indsættes igen over montagegestellet (6) oppe-
fra og forbindes med den nedre korpusramme (16a), og det udvendige kor-
pus (2) fastgøres på den øvre korpusramme (16b) af det indvendige korpus
(21).

10

11. Fremgangsmåde ifølge krav 10,

kendetegnet ved, at

15

det forreste nederste tværstykke af den øvre korpusramme (16b) afmonteres
inden aftagningen af den øvre korpusramme (16b), og den øvre korpusram-
me (16a) med henblik på aftrækning løftes, indtil den kommer ud af indgrebet
fra føringerne af den nedre korpusramme (16a) og derefter trækkes af bag-
ud.

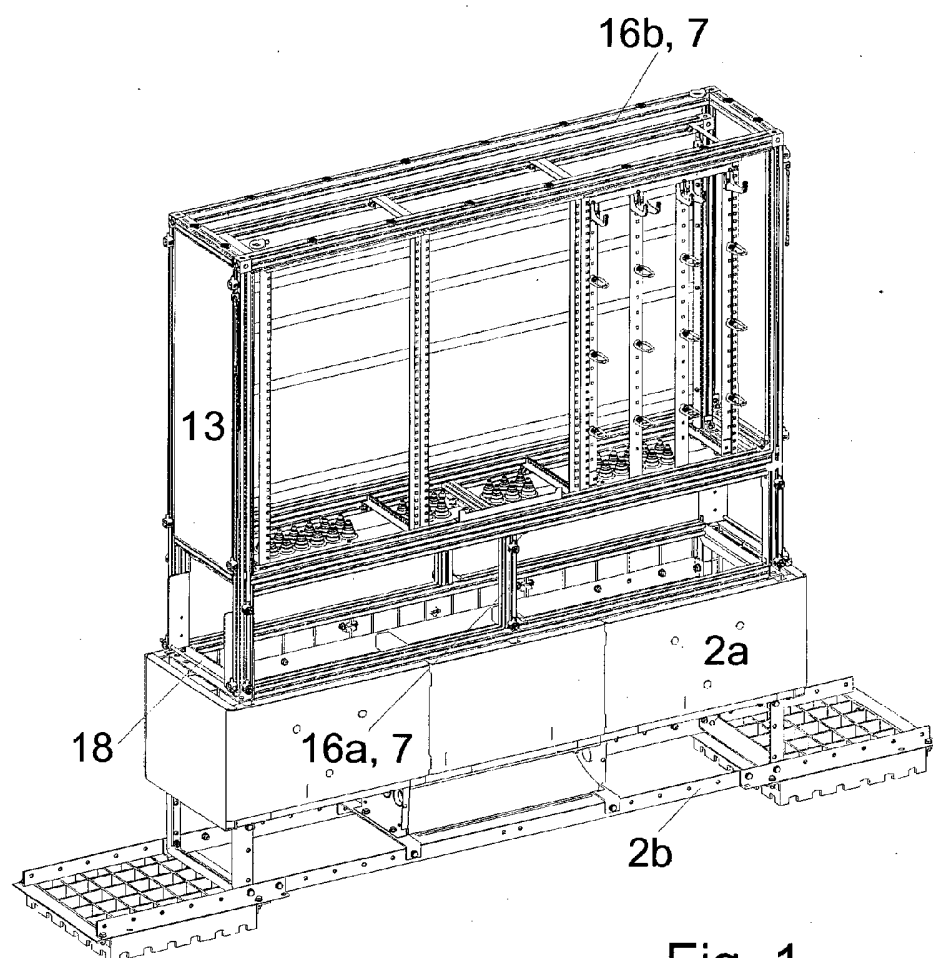
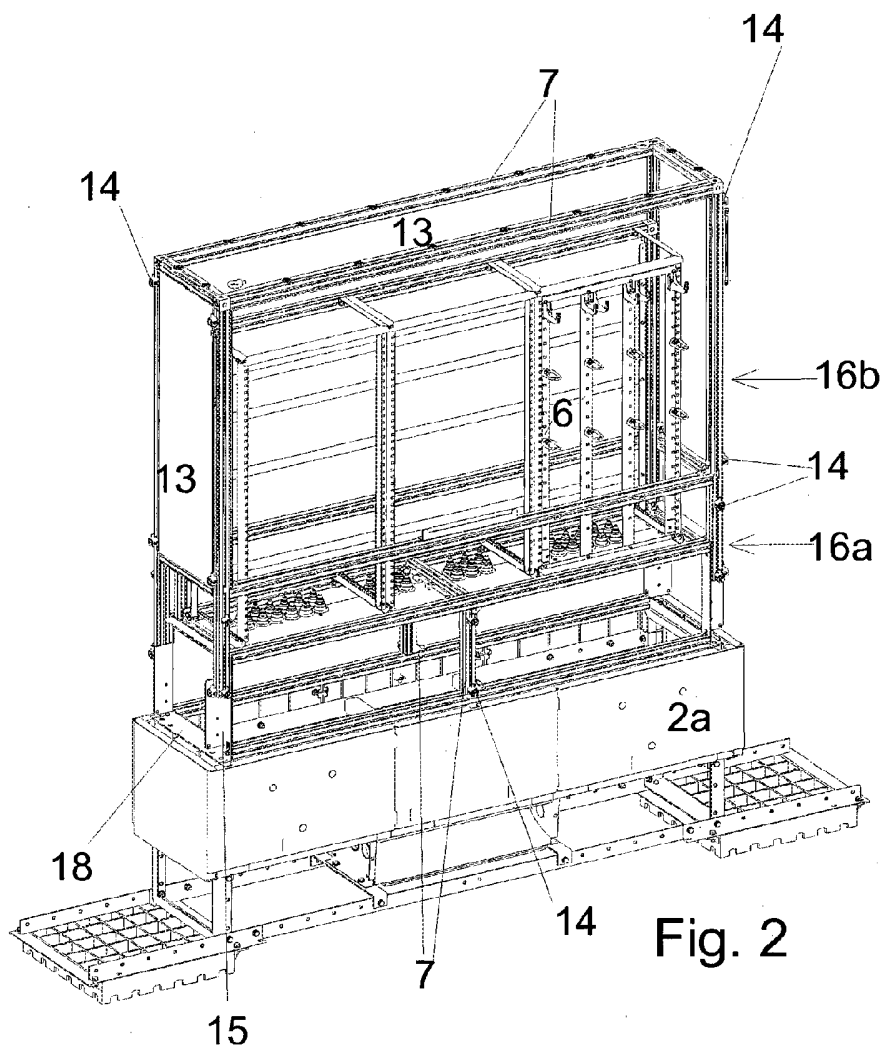


Fig. 1



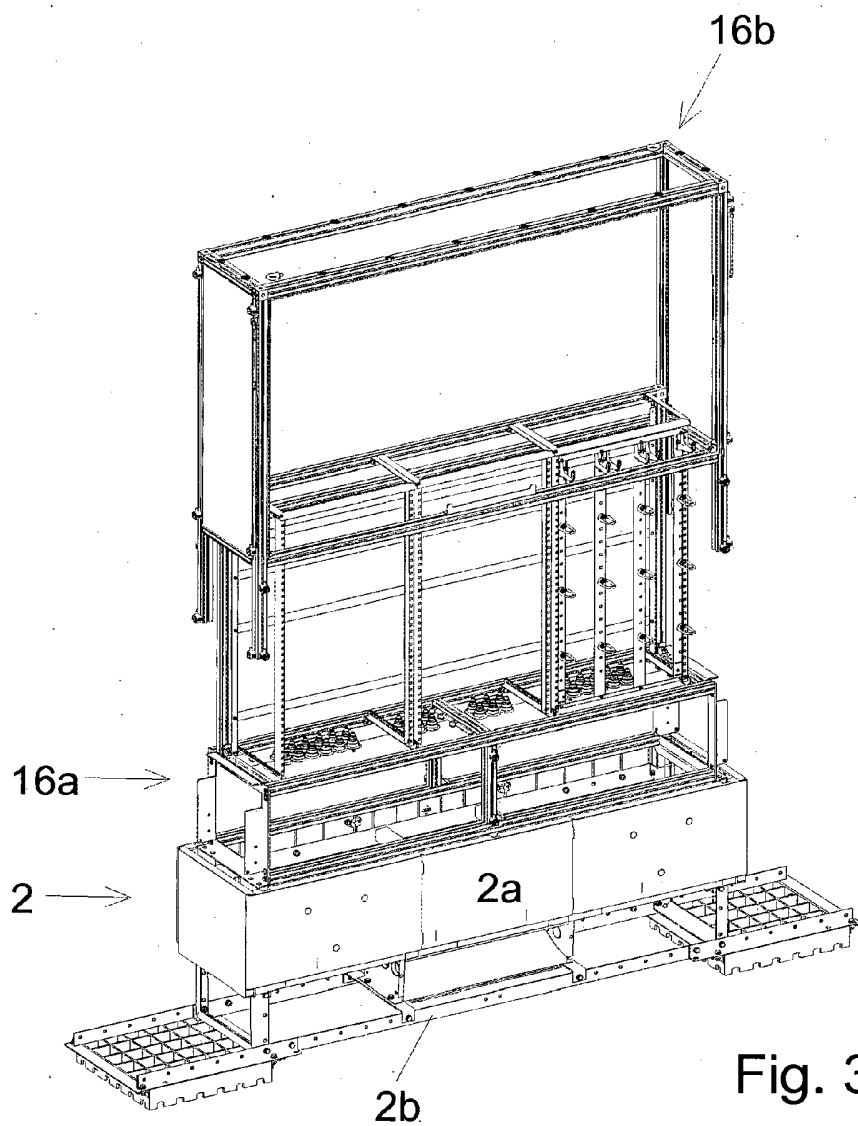


Fig. 3

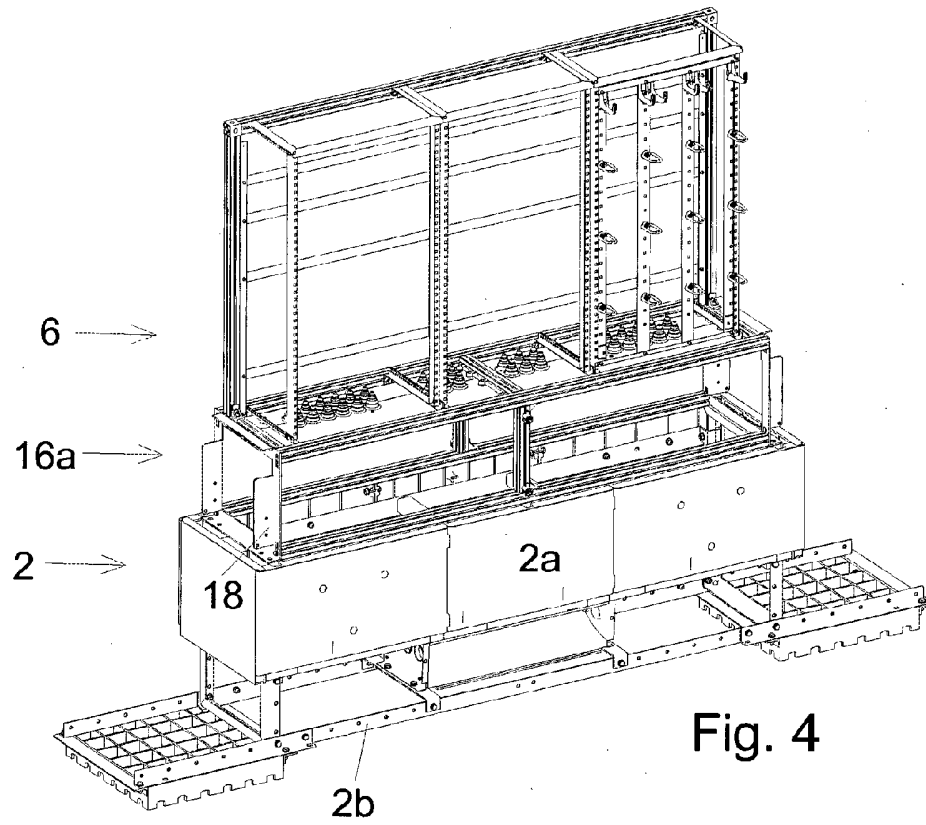


Fig. 4

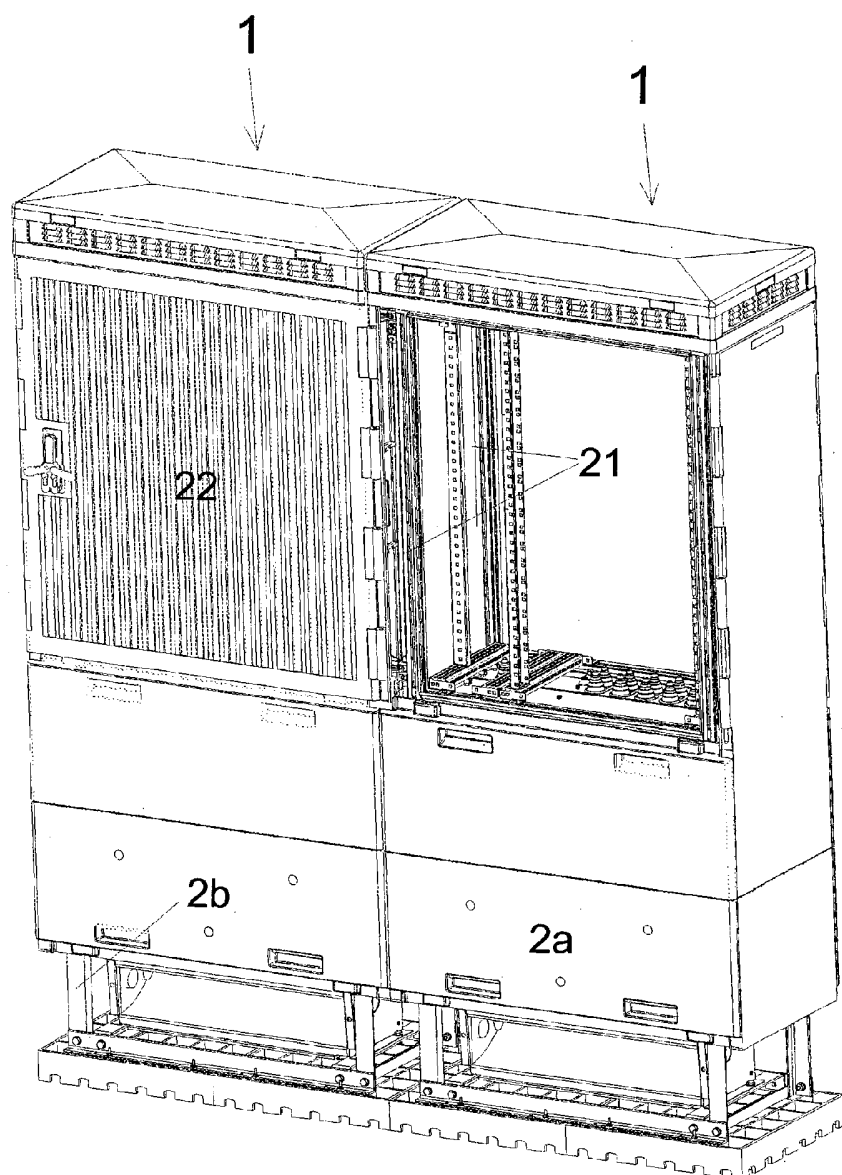


Fig. 5

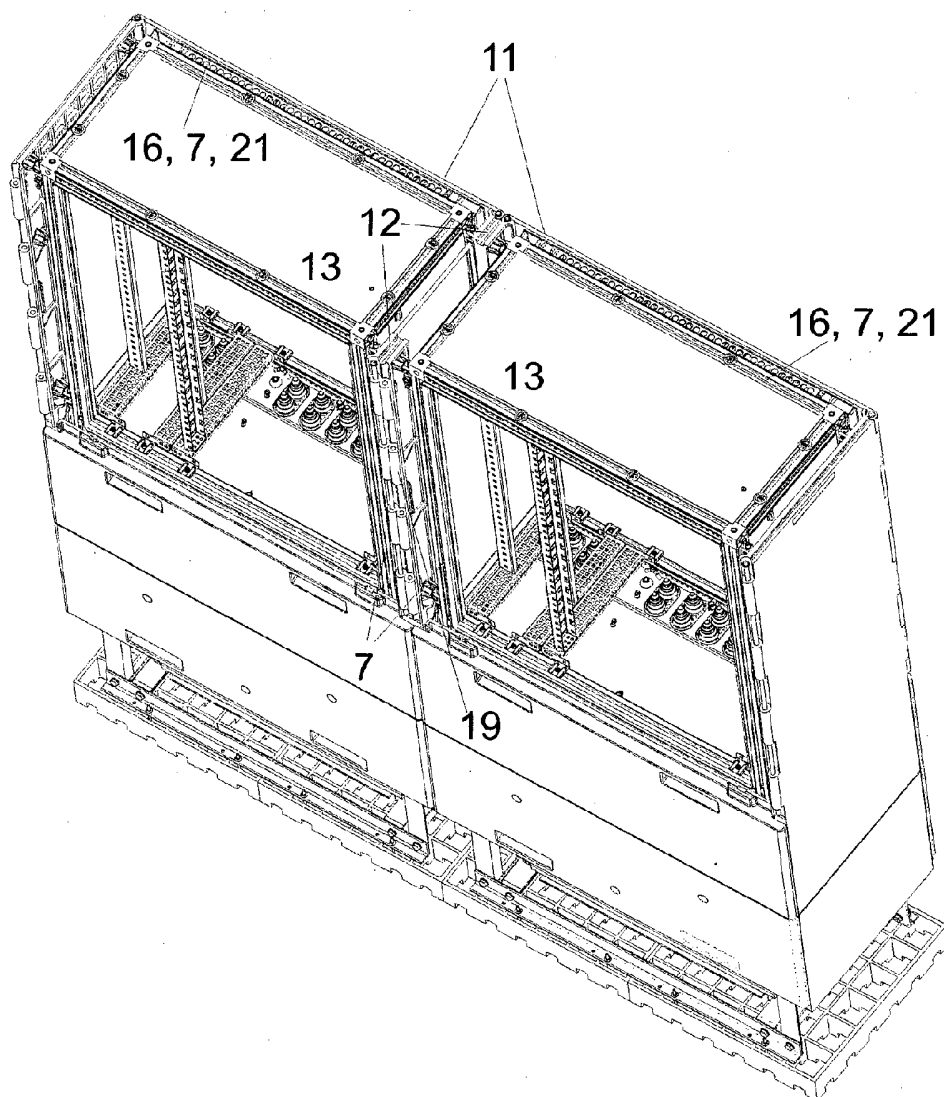


Fig. 6

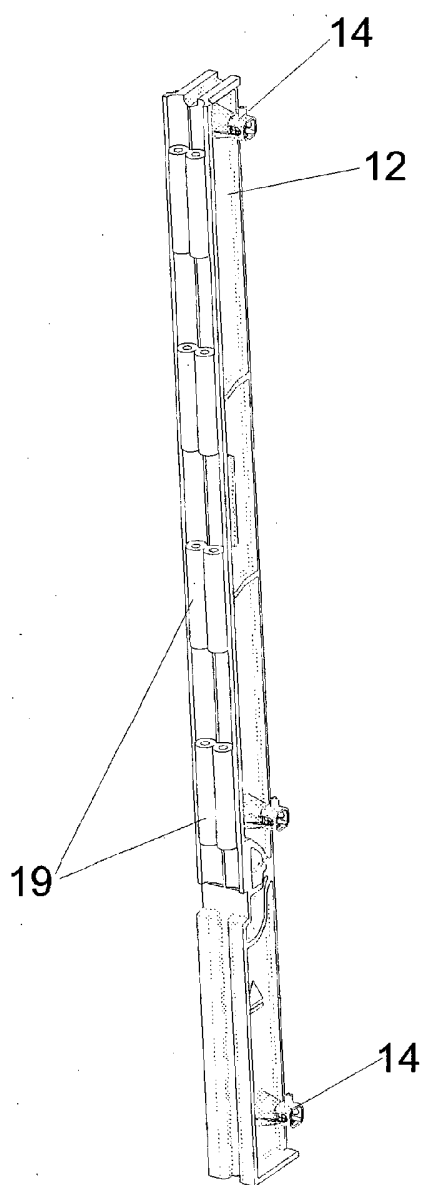


Fig. 7