

611792

FORM 1
REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-1973

APPLICATION FOR A PATENT

We RITTAL-WERK RUDOLF LOH GmbH & Co. KG.

of Auf dem Stuzelbert, 6348 HERBORN, WEST GERMANY

hereby apply for the grant of a Patent for an invention entitled:

HOLDERS WITH POWER BUSBARS FOR A BUSBAR SYSTEM

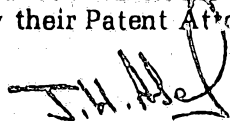
which is described in the accompanying complete specification. This Application is a Convention Application and is based on the Application numbered: P 38 11 455 0-34 for a Patent or similar protection made in West Germany on 6 April 1988.

Our address for service is:

GRIFFITH HACK & CO.
71 YORK STREET
SYDNEY N.S.W. 2000
AUSTRALIA

DATED this 5th day of April, 1989.

RITTAL-WERK RUDOLF LOH GmbH & Co. KG.
By their Patent Attorneys



GRIFFITH HACK & CO.

TO: THE COMMISSIONER OF PATENTS
COMMONWEALTH OF AUSTRALIA

006573 05/04/89

ASSIGNEE - APPLICANT

A7195

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT

In support of an Application made by:
RITTAL-WERK RUDOLF LOH GmbH & Co. KG.

for a patent for an invention entitled:
HOLDERS WITH POWER BUSBARS FOR A BUSBAR SYSTEM

I, Friedhelm Loh

of, Auf dem Stutzelberg, 6348 HERBORN, WEST GERMANY

do solemnly and sincerely declare as follows:

1. I am authorised by the above mentioned applicant for the patent to make this Declaration on its behalf.
2. The name and address of each actual inventor of the invention is as follows:
Hans Wagener

of Rittershauser Str. 14, 6344 Dietzholzthal-Rittershausen, WEST GERMANY

and the fact(s) upon which the applicant is entitled to make this application are as follows:

The applicant is the assignee of the
said invention from the said inventor

3. The basic application(s) as defined by Section 141 of the Act was (were) made as follows:

Country West Germany on 6 April 1988
in the name(s) Rittal-werk Rudolf Loh GmbH & Co. KG.

4. The basic application(s) referred to in the preceding paragraph of this Declaration was (were) the first application(s) made in a Convention country in respect of the invention the subject of this application.

Declared at HERBORN this 28th day of APRIL 1989.

Signed: _____

Position: _____
Friedhelm Loh

GRIFFITH HACK & CO., SYDNEY, AUSTRALIA

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HOLDERS WITH POWER BUSBARS FOR A BUSBAR SYSTEM

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(56) Prior Art Documents
US 4031433

(57) Claim

1. A holder with busbars for a busbar system, comprising:

an insulating support with receptacles in its top surface, a plurality of busbar sections arranged to be fixed in position in said receptacles at regular intervals parallel to one another,

the insulating support being in the form of a carrier plate that extends over the lengths of the busbar sections;

a row of openings located in the carrier plate at least between adjacent busbar sections, said openings being aligned perpendicularly to the busbar sections; and

channels located in the bottom of the carrier plate which serve as cable ducts, said channels connecting perpendicularly aligned openings.

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

Form 10

COMPLETE SPECIFICATION

FOR OFFICE USE

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Priority:

Related Art:

TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled:

HOLDERS WITH POWER BUSBARS FOR A BUSBAR
SYSTEM

The following statement is a full description of this invention,
including the best method of performing it known to me/us:-

1 Holders with Power Busbars for a Busbar System

5 The present invention relates to a holder for busbars, the holder comprising an insulation carrier arranged to seat each busbar.

10 A holder is disclosed in DE-PS 31 43 518. The insulation carrier in this context is designed as a slender, cuboidal shaped attachment part which extends crosswise to the power busbar sections and fixes them at a distance to the attachment surface. The power busbar sections are fixed in their lengthways direction at several positions spaced from each other by means of such holders. Electrical devices can be connected directly with the power busbar sections between the cuboidal shaped holders. In this case the power supply cables for the electrical devices are laid unprotected at the connection points of the electrical devices. This cabling has, in addition, the disadvantage that not only are the power supply cables badly laid out, they can also come into contact with the electrically charged parts of the busbar system which carry a different potential so that there is a danger of short circuits.

15 According to the present invention there is provided a holder with busbars for a busbar system, comprising:

20 an insulating support with receptacles in its top surface, a plurality of busbar sections arranged to be fixed in position in said receptacles at regular intervals parallel to one another,

25 the insulating support being in the form of a carrier plate that extends over the lengths of the busbar sections;

30 a row of openings located in the carrier plate at least between adjacent busbar sections, said openings being aligned perpendicularly to the busbar sections; and

35 channels located in the bottom of the carrier plate which serve as cable ducts, said channels connecting perpendicularly aligned openings.



According to a preferred embodiment of the present invention, the channels are developed as drillings which are arranged at regular intervals to each other in the longitudinal direction of the power busbar sections or the channels are developed as slots which are aligned by their larger dimensions in the longitudinal direction of the power busbar sections and arranged at regular intervals to each other.

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Sufficient space for the power supply cables is created in these cable channels by the fact that the openings extend over a part of the thickness of the carrier plate that corresponds to approximately a third and up to a half of the thickness of the carrier plate.

The fixing of the power busbar sections on the carrier plate is performed, according to one embodiment, by the power busbar sections being screwed to the carrier plate. In this case it is advantageously provided for that the screw positions of the power busbar sections are arranged at regular intervals to each other in the longitudinal direction and laterally aligned on top of each other in order for uniformly developed power busbar sections to be used.

The space for the cable channels can be extended in that the underside of the carrier plate in the area of the screw positions has vertical plates, running laterally to the power busbar sections, that end on a common plane of the carrier plate and have cylindrical enlargements in the area of the screw positions. It is then provided for that the channels of the carrier plate developed as slots each extend over the area of the carrier plate between adjacent vertical plates in order to enable power supply cables to be laid over the entire width of the cable channels on the upper side of the carrier plate.

The connection of the electrical devices to the power busbar sections can then be easily carried out if the layout is undertaken in such a manner that the power busbar sections have Z shaped cross sections and are each introduced into the seats of the carrier plate and screwed to it and in that the other lateral flanges of the Z shaped power busbar sections are arranged running parallel and at a distance to the upper side of the carrier plate as connecting flanges.



The busbar system can be thus easily expanded in that the seats in the area of the narrow sides of the carrier plate running laterally to the power busbar sections pass over into expanded connecting seats for connector elements which connect the power busbar sections of continuously connected carrier plates to each other in an electrically conductive manner as well as by the fact that the carrier plate is developed with an angular shape having two carrier plate sections perpendicular to each other and retains angular power busbar sections and that in both carrier plate sections the openings run perpendicular to the angular power busbar sections fixed in it.

The angular carrier plate, according to another embodiment, can be composed of two part carrier plates where the ends turned towards each other are at a complementary angle of 45° to the longitudinal direction of the power busbar sections.

Optionally, the carrier plate may be equipped with attachment seats for attachment devices, such as attachment screws or similar devices, outside of the openings.

A preferred embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings.

Figure 1 shows in plan view the holders with power busbars consisting of the carrier plate and the power busbar sections,

Figure 2 shows a cross section through the holder with power busbars along the line II-II in Figure 1, Figure 3 shows in plan view an angular holder



with power busbars with two part carrier plates and angular power busbar sections and

Figure 4 shows in plan view another operational example of a holder with power busbars.

The operational example according to Figures 1 and 2 shows a holder with power busbars which as the insulation carrier has a carrier plate 10 that has a rectangular shape with its sidewalls 16 and ends 18 and 19. Three seats 11 are made in the upper side of the carrier plate 10 at equal distances for three identical power busbar sections 20. The power busbar sections 20 have a Z shaped cross section where a lateral flange 21 is screwed to the carrier plate 10 at regular intervals as the screw positions 24 show. The other lateral flange 23 which is at a prescribed distance to the carrier plate 10 via the centre flange 22 serves as a connecting flange to which the electrical devices are attached. In this instance the electrical connection is made between the power busbar section 20 and the electrical device.

The seats 11 in the upper side of the carrier plate 10 are matched in cross section to the cross section of the lateral flange 21 of the power busbar sections 20 so that they end flush with the upper side. A series of openings 12 is made in the carrier plate 10 in each case between the lower power busbar section 20 and the centre power busbar section 20 as well as between the centre power busbar section 20 and the upper power busbar section 20. These openings 12 are developed as drillings in the operational example which are arranged in the longitudinal direction of the power busbar sections 20 and the carrier plate 10 at regular intervals.

Pairs of openings 12 are aligned on top of each other laterally to



the power busbar sections 20. Groove shaped channels 13, 14 and 15, which extend over about one third to one half of the thickness of the carrier plate 10, are made in the underside of the carrier plate 10 which forms the attachment side of the carrier plate 10. These channels 13, 14 and 15 run perpendicularly to the busbar sections 20 and form cable channels which connect pairs of openings 12 to the sidewalls 16 and 17 of the carrier plate 10. A power supply cable can be laid to the sidewall 16 and introduced in one opening 12 of a pair via the channel 13 and 14. The power supply cable can, however, also be introduced into the sidewall 17 and introduced into the other opening of the pair of openings 12 via the channel 15 and 14 and led out from them. The carrier plate 10 covers, in this instance, the power cables and prevents contact with electrically charged parts. Attachment seats 30 for attachment devices, such as attachment screws, are made in the border areas of the sidewalls 16 and 17.

The power busbar sections 20 end flush with the carrier plate 10 on the ends 19 and 18. The seats 11 end in the area of the ends 19 and 18 in extended connecting seats 27 for plate shaped connector contacts 226 which are used for electrically connecting power busbar sections 20 during the continuous connecting of holders with power busbars. The power busbar sections 20 bear attachment drillings 25 for attachment screws 29 which are screwed into the connector elements 26 and 28 in the area of the connecting seats. In this case, the two piece connecting element can be composed of an insulating part and a contact part as can be seen in Figure 2. Half of the connecting elements 26 and 28 project into the connecting seat 27 so that two adjacent carrier plates 10 can be continuously connected to each other.

As the operational example according to Figure 3 shows the carrier plate can also be developed in an angular shape and be composed of two part carrier plates 10.1 and 10.2 which are at an angle of 45° to the part



sections of the angular power busbar sections 20 and supplement themselves to a mitre joint. The part carrier plates 10.1 and 10.2 can also be single pieced. Openings 12 are again made between adjacent power busbar sections 20 and the channels 13, 14 and 15 are perpendicular to the sidewalls 16 and 17 of the part carrier plates 10.1 and 10.2 serving as outer edges of the angular holder and thus perpendicular to the part sections of the angular power busbar sections 20. The ends 18 and 19 of the angular holder are perpendicular to each other and are arranged for connection to another holder.

The operational example according to Figure 4 differs from the other embodiment due to the type of openings 12 and channels 13, 14 and 15. Vertical plates 31 running laterally to the power busbar sections 20 are formed on the underside of the carrier plate 10 which end on a common attachment plane. These vertical plates 31 connect the screw positions aligned perpendicularly to the busbar section direction and are equipped with cylinder shaped enlargements 32 in these areas. The channels 13, 14 and 15 extend therefore between adjacent vertical bars 31 which, like the screw positions 24, are arranged at regular intervals in the longitudinal direction of the power busbar sections 20. The openings 12 are developed as slots which, extend between adjacent vertical bars 31. The access for the power supply cables is made on the sidewalls 16 and 17 via the channels 13 and 15.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A holder with busbars for a busbar system, comprising:

an insulating support with receptacles in its top surface, a plurality of busbar sections arranged to be fixed in position in said receptacles at regular intervals parallel to one another,

the insulating support being in the form of a carrier plate that extends over the lengths of the busbar sections;

a row of openings located in the carrier plate at least between adjacent busbar sections, said openings being aligned perpendicularly to the busbar sections; and

channels located in the bottom of the carrier plate which serve as cable ducts, said channels connecting perpendicularly aligned openings.

2. A holder with busbars according to Claim 1 wherein the openings are holes arranged in the longitudinal direction of the busbar sections at regular intervals with respect to one another.

3. A holder with busbars according to Claim 1 wherein the openings are slots which are aligned with their greater dimensions in the longitudinal direction of the busbar sections and are arranged at regular intervals with respect to one another.

4. A holder with busbars according to any one of Claims 1, 2 and 3 wherein the channels extend over one-third up to one-half of the thickness of the carrier plate.

5. A holder with busbars according to any one of Claims 1, 2 and 3 wherein the busbar sections are screw-mounted to the carrier plate.



6. A holder with busbars according to Claim 5 wherein the screw locations of the busbar sections are arranged at equal intervals in the longitudinal direction of the busbar sections and perpendicularly to the busbar sections.

7. A holder with busbars according to Claim 6 wherein the bottom of the carrier plate has crosspieces running perpendicularly to the busbar sections in the areas of the screw locations, said crosspieces ending in a common mounting plane of the carrier plate and having cylindrical extensions in the areas of the screw locations.

8. A holder according to Claim 7 wherein the openings each extend between adjacent crosspieces.

9. A holder according to any of one Claims 1 to 3, and 6 to 8 characterized by the fact that the busbar sections have a Z-shaped cross section, are arranged to be inserted into the receptacles of the carrier plate with one cross arm of the Z-shaped cross-section busbar sections in each case, and are arranged to be screwed to said carrier plate; the other cross arms of the Z-shaped busbar sections functioning as connecting arms.

10. A holder according to any one of Claims 1 to 3, 6 to 8 wherein the receptacles comprise connecting recesses, for connecting elements, in the area of the sides of the carrier plate running perpendicularly to the busbar sections, in said connecting recesses connecting elements being provided for mechanically and electrically connecting the carrier plate to other carrier plates and for joining the busbar sections with other busbar sections on other carrier plates in rows.

11. A holder according to any one of Claims 1 to 3, and 6 to 8 wherein the carrier plate is angular with two angular carrier plate sections perpendicular to one another

and accommodates angular busbar sections; and in both carrier plate sections, the channels run perpendicularly to the adjacent angular busbar sections fixed in position in said recesses.

5 12. A holder according to Claim 11 wherein the angular carrier plate is composed of two partial carrier plates, the sides facing one another having complementary angles of 45 degrees with respect to the longitudinal direction of the angular busbar sections.

10 13. A holder according to any one of the Claims 1 to 3, 6 to 8 and 12 wherein the carrier plate is equipped with mounting holes for mounting hardware.

15 14. A holder with power busbars for a busbar system, substantially as hereinbefore described with reference to the accompanying drawings.

20 DATED this 5th day of March 1991
RITTAL-WERK RUDOLF LOH GmbH & CO. KG.

By their Patent Attorneys
GRIFFITH HACK & CO.



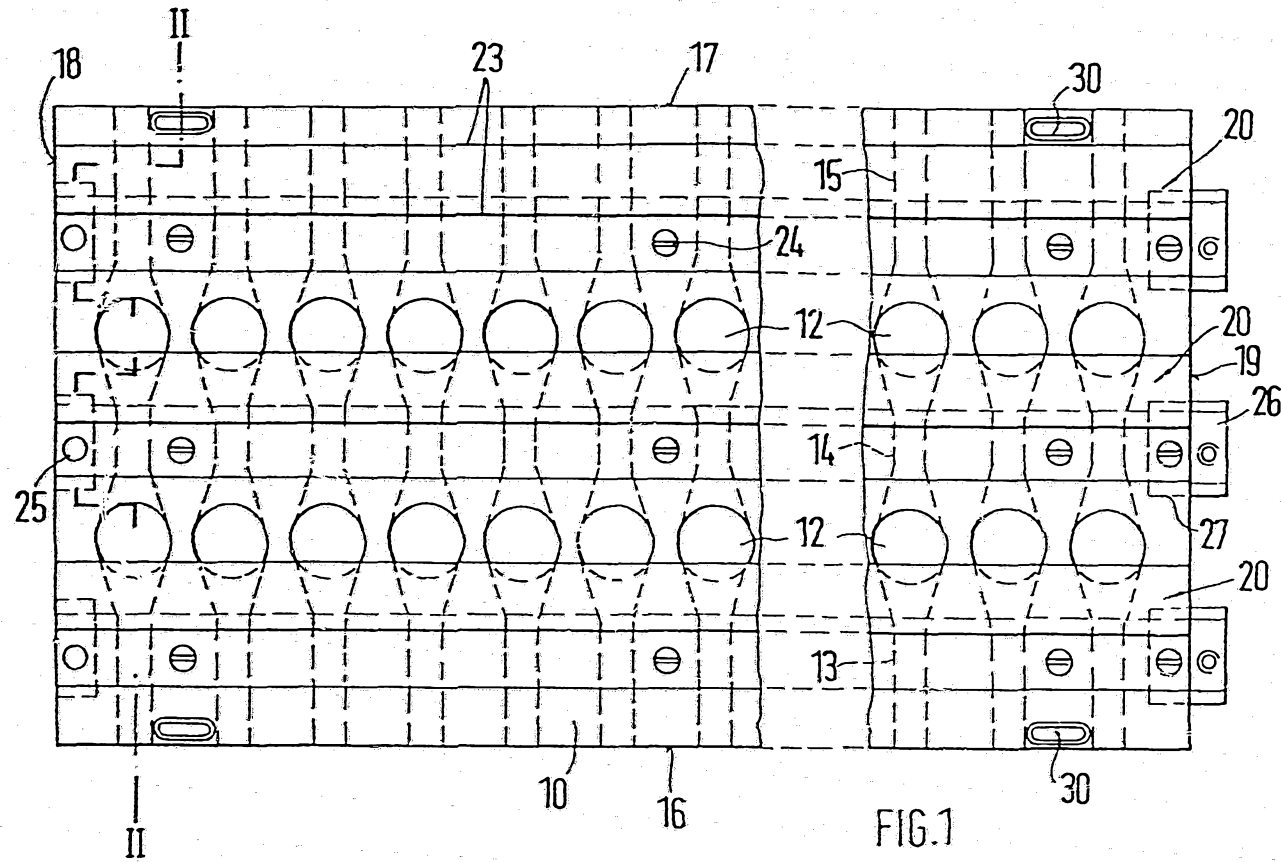


FIG.1

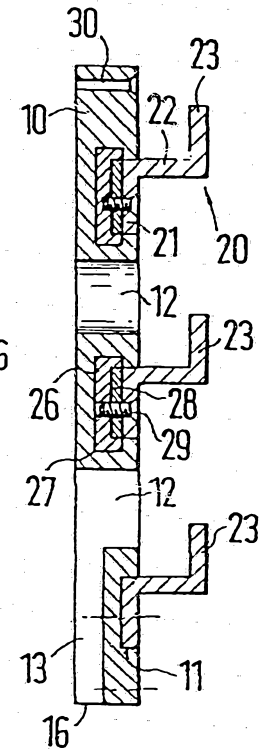


FIG.2

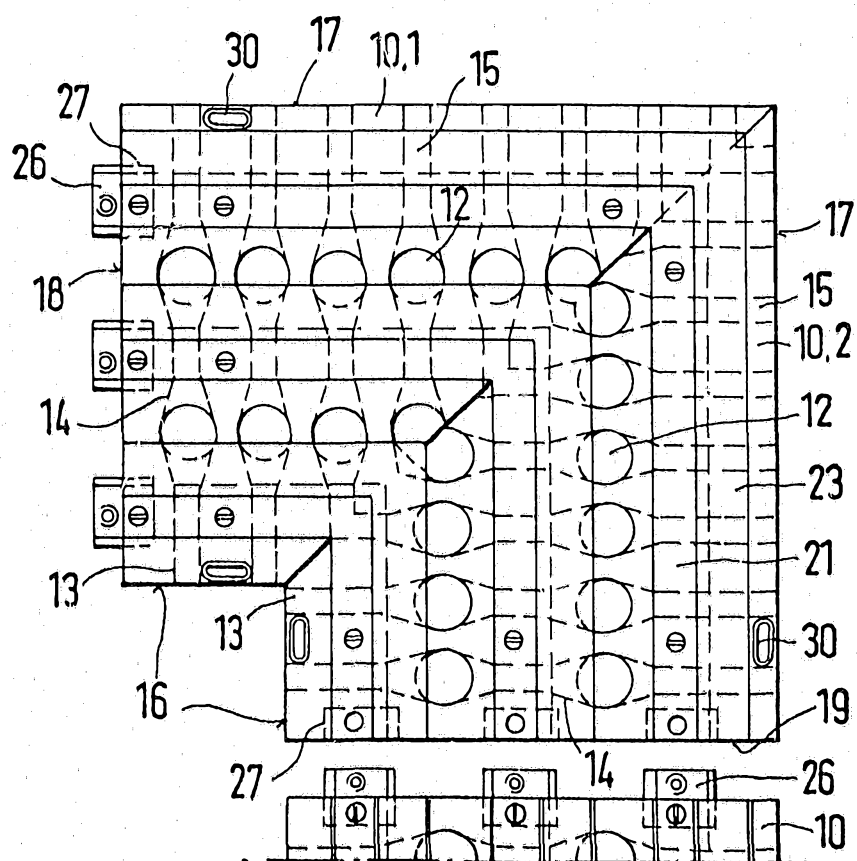


FIG. 3

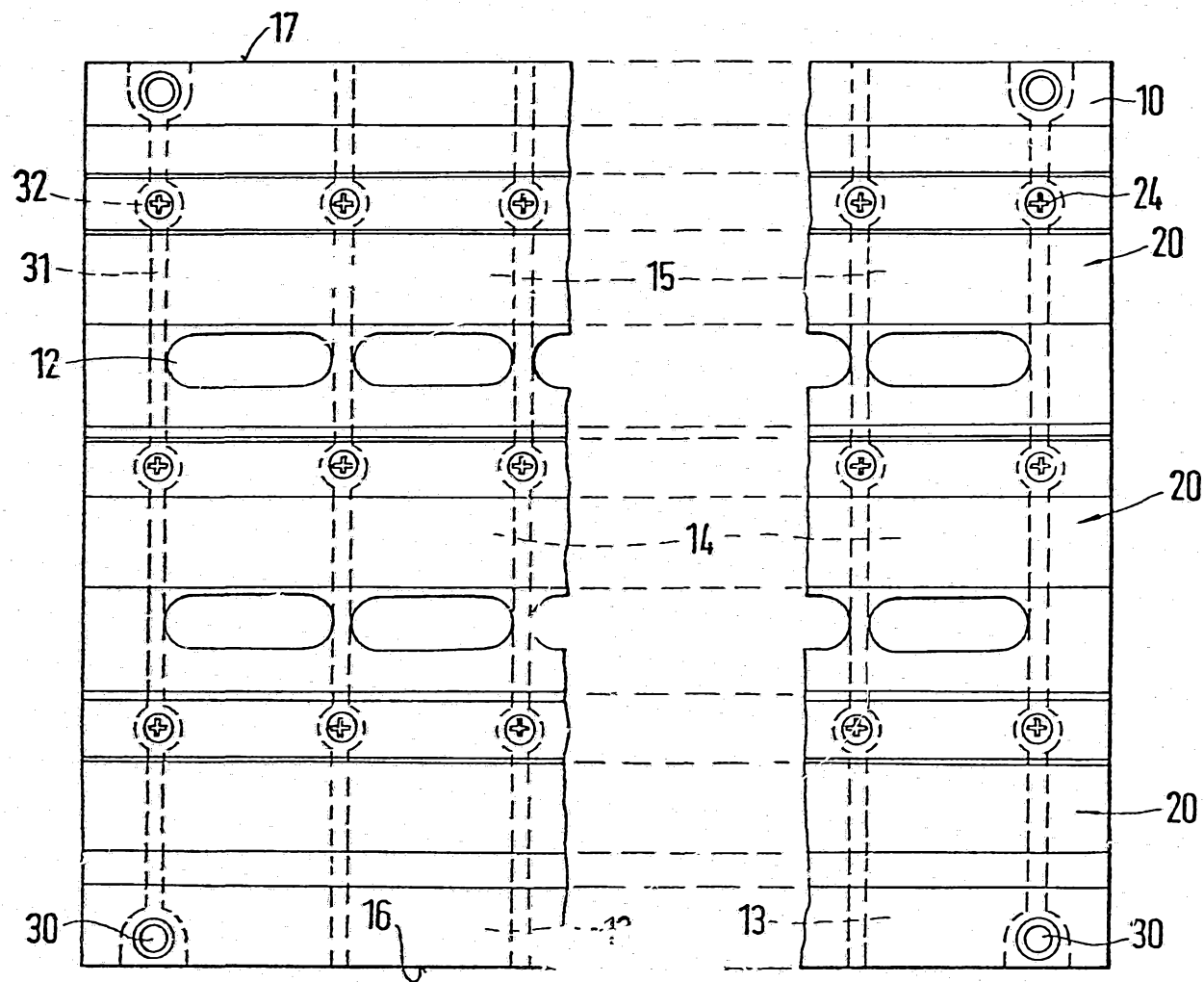


FIG.4