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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:

BUSBAR SYSTEM WITH HOLDERS AND POWER BUSBAR SECTIONS

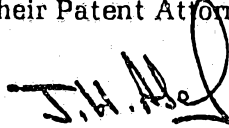
which is described in the accompanying complete specification. This Application is a Convention Application and is based on the Application numbered: P 38 11 457.7-34 for a Patent or similar protection made in West Germany on 6 April 1988.

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

6006573 05/04/89

9477A:rk

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:  
BUSBAR SYSTEM WITH HOLDERS AND POWER BUSBAR SECTIONS

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: \_\_\_\_\_

GRIFFITH HACK & CO., SYDNEY, AUSTRALIA

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(12) PATENT ABRIDGMENT (11) Document No. AU-B-32486/89  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 615529

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BUSBAR SYSTEM WITH HOLDERS AND POWER BUSBAR SECTIONS
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- (43) Publication Date : 12.10.89
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- (71) Applicant(s)  
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- (56) Prior Art Documents  
AU 58847/73 H02G 5/04  
US 4030794  
GB 594896
- (57) Claim

1. A busbar system with holders, the tops of said holders having a number of receptacles shaped like slots and running in parallel with busbar sections which are arranged to be spaced apart in parallel and fixed in position in said receptacles, said holders being substantially rectangular carrier plates having ends and longitudinal sides, the busbar sections being arranged to abut the ends of the carrier plates;

ends of the receptacles comprising recesses arranged to accommodate part of connecting elements aligned in the longitudinal direction of the busbar sections;

connecting elements being arranged to be connected so as to electrically conductively connect adjacent busbar sections and so that the holders are joined together in a row with the ends of adjacent busbar sections abutting.

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PATENTS ACT 1952

Form 10

**COMPLETE SPECIFICATION**

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:  
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Complete Specification-Lodged:  
Accepted:  
Lapsed:  
Published:

Priority:

Related Art:

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**TO BE COMPLETED BY APPLICANT**

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Actual Inventor: Hans Wagener

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Complete Specification for the invention entitled:

BUSBAR SYSTEM WITH HOLDERS AND POWER  
BUSBAR SECTIONS

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

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# Busbar system with holders and power busbar sections

The invention concerns a busbar system with holders which have several seats in their upper sides for power busbar sections, which are fixed in these seats, positioned at a distance and running parallel to each other.

A holder for such a type of busbar system is known as a result of DE-PS 31 43 518. In this instance, the holders are cuboid shaped and slender and extend only over a portion of the power busbar sections and cover them. The result of this is that no electrical devices can be connected to the power busbar sections in the area of the holder. Apart from this the connecting together of power busbar sections for the extension of the busbar system is not possible in a way that electrical devices can be connected with the power busbar sections even in the area of abutment of adjacent power busbar sections. The power busbar sections are completely open between the holders, which increases the area of short circuits in busbar systems with cabled electrical devices.

It is the object of the preferred embodiment of the invention to develop a busbar system of the type mentioned at the beginning so that it can be extended easily with complete covering of the power busbar sections up to an attachment surface.

According to one aspect of the present invention there is provided a busbar system with holders, the tops of said holders having a number of receptacles shaped like slots and running in parallel with busbar sections which are arranged to be spaced apart in parallel and fixed in position in said receptacles, said holders being substantially rectangular carrier plates having ends and longitudinal sides, the busbar sections being arranged to abut the ends of the carrier plates;

ends of the receptacles comprising recesses arranged to accomodate part of connecting elements aligned in the longitudinal direction of the busbar sections;



connecting elements being arranged to be connected so as to electrically conductively connect adjacent busbar sections and so that the holders are joined together in a row with the ends of adjacent busbar sections abutting.

5 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 a holder in plan view with power busbar sections inserted;

10 Figure 2 shows a cross section through the holder along the line II-II in Figure 1;

Figure 3 shows an enlarged partial plan view of the electrical through switching of the power busbar sections of continuously connected holders by means of a twopart connecting element; and

15 Figure 4 shows an enlarged partial section of the electrical through switching of the power busbar sections of continuously connected holders by means of a single part connecting element.

20 As the operational example according to Figures 1 and 2 shows, the holder is developed as a rectangular carrier plate 10 made out of insulating material and carries three longitudinally aligned groove shaped seats 11 on an upper side which are arranged laterally to the power busbar sections 20 inserted equidistant to each other in it. The power busbar sections 20 are Z shaped in cross section whereby one lateral flange is aligned flush in the seat 11 and fixed in it by means of the screws 24. The screws 24 of each busbar are aligned vertically and are also arranged equidistantly in the longitudinal direction of the power busbar sections 20. The centre flanges of the power busbar sections 20 serve as distance flanges 22 which hold the other lateral flanges of the power busbar sections 20 as clamping flanges 23 for the purpose of fixing the electrical devices at prescribed

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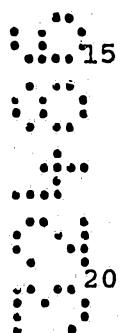
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distances and parallel to the upper side of the carrier plate 10. The power busbar sections 20 extend over the entire length of the carrier plate 10, running parallel to their sidewalls 16 and 17 and ending flush with the narrow sides 18 and 19 of the carrier plate 10 which run vertical to the power busbar sections 20. The carrier plate 10 insulates and covers the power busbar sections 20 completely up to the attachment surface. Laterally running channels 13, 14 and 15 are made in the underside of the carrier plate 10 which extend over a portion of the thickness of the carrier plate 10. A series of openings 12 developed as drillings is made between adjacent power busbar sections 20 in the carrier plate 10. The openings 12 are arranged in the longitudinal direction of the power busbar sections 20 and in series, the openings 12 are aligned perpendicular to the longitudinal direction of the power busbar sections. The channels 13 connect the sidewall 16 with the series of openings 12 whereas the channels 15 connect the sidewall 17 to the series of openings 12. The channels 14 connect the openings 12 of both the series. The channels 13, 14 and 15 serve in this way as cable channels in which power and connecting cables in the prescribed division of the openings 12 into the series can be led protected through the carrier plate 10 to the electrical devices fixed on the clamping flanges 23 of the power busbar sections 20. The carrier plate 10 carries attachment seats 30 for attachment screws in the border areas of the sidewalls 16 and 17.

The holder with the carrier plate 10 and the power busbar sections 20 fixed in the seats 11 form a prefabricated unit. Several holders of this type can be connected to each other into a busbar system. In this case, the ends of the power busbar sections 20 arranged side by side must be connected to each other by means of electrically conductive members. Also in this case power busbar sections 20 with the same cross sections are used in the holders. If the clamping flanges of all the power



busbar sections 20 are aligned to sidewall 17 of the carrier plate 10, then the clamping flanges 23 have the same average distance as the seats 11 in the carrier plate 10 which corresponds to that on the sliding bows or spring contacts of the attached electrical devices.

As the section according to Figure 4 shows, enlargements 27 are made in the channel base of the groove shaped seats 11 in the end sections of the vertical sides 18 and 19 of the carrier plate 10 that retain half of a single piece, plate shaped connector element 26. The width, the depth and the height of these enlargements 27 correspond to the width, the half length and the thickness of the electrically conducting connector element 26. The power busbar sections 20 carry via the enlargement 27 attachment seats 25 for attachment screws 29 that are screwed into the screw thread seats 31 of the connector element 26. In this way the carrier plates 10 can be connected to each other without a separating joint and the connector elements 26 make an electrical connection with the power busbar sections 20 below the attachment flange 21. In this case the full width of the attachment flange 21 is used as a contact surface if the enlargement 27 and connector elements 26 extend over the entire width of the attachment flange 21 of the power busbar sections 20.

As the view according to Figure 3 shows the electrical connection can also be performed by means of two piece connector elements. As figure 2 indicates, the contact plates 28 made of conducting material over the entire width of the attachment flange 21 of the power busbar sections 20 whereas the U shaped insulating plates 26 in the cross section provide insulating cover for the sidewalls of the contact plates 28 with their side flanges 32. The enlargements 27 therefore have a width that is larger than the width of the attachment flange 21 of the power busbar sections 20. The contact plates 28 have through drillings 33, via the



screw thread seats 31 of the insulating plates 26, for the attachment screws 29 which are again inserted into the attachment seats 25 of the power busbar sections 20.

As Figure 5 shows the connector elements 34 can also be arranged via the attachment <sup>flange</sup> ~~screws~~ 21 of the power busbar sections 20. The seats 11 then have the same cross section over the entire length of the carrier plate 10. The attachment screws 25 in the end sections of the power busbar sections 20 retain the attachment screws 29 which, however, were earlier introduced through the through drillings 35 of the connector elements 34 and screwed, through the seats 25, into the screw thread seats 36 which are made in the carrier plate 10 below the seats 25 or made when screwing in tapping attachment screws 29. The connector elements cover the attachment flanges 21 of the power busbar sections 20 in width where the separating or closing plates 37 of the carrier plate 10 represent a limit and the power busbar sections are insulated high up to the clamping flanges 23 against each other.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A busbar system with holders, the tops of said holders having a number of receptacles shaped like slots and running in parallel with busbar sections which are arranged to be spaced apart in parallel and fixed in position in said receptacles, said holders being substantially rectangular carrier plates having ends and longitudinal sides, the busbar sections being arranged to abut the ends of the carrier plates;
- ends of the receptacles comprising recesses arranged to accomodate part of connecting elements aligned in the longitudinal direction of the busbar sections;
- connecting elements being arranged to be connected so as to electrically conductively connect adjacent busbar sections and so that the holders are joined together in a row with the ends of adjacent busbar sections abutting.
2. A busbar system according to Claim 1 wherein the recesses for the connecting elements are provided in bottom walls of the receptacles.
3. A busbar system according to Claim 2 wherein the width, depth and height of the recesses are matched to the width, to one-half the length and to the thickness of the connecting elements and each connecting element is in the shape of a plate.
4. A busbar system according to any one of Claims 1 to 3 wherein the busbar sections are equipped with mounting holes for mounting screws over the recesses; and said connecting elements are equipped with threaded holes into which said mounting screws can be screwed.
5. A busbar system according to Claim 1 wherein the busbar sections have mounting arms which are arranged to be inserted into the receptacles of the carrier plates and



are arranged to be connected to said carrier plates by means of connecting screws, with the connecting screws being located at regular intervals with respect to one another in the longitudinal direction of the busbar sections and being aligned perpendicularly to the busbar sections one above another.

5 6. A busbar system according to any one of Claims 1 to 3 and 5 wherein

the widths of the recesses correspond to the widths of mounting arms of the busbar sections and of the connecting elements.

10 7. A busbar system according to any one of Claims 1 to 3 and 5 wherein

the connecting elements are made of electrically conducting material.

15 8. A busbar system according to any one of Claims 1 to 3 and 5 wherein

the connecting elements are each composed of an insulating support and a contact plate, and there are threaded holes in the insulating support and aligned through-holes in the contact plate.

20 9. A busbar system according to Claim 8 wherein the insulating supports cover the side walls of the contact plates, said side walls running in parallel with the busbar sections.

25 10. A busbar system according to any one of Claims 1 and 5 wherein

connecting elements are arranged above the mounting arms of the busbar sections and are connected with the mounting arms so as to conduct electrically.

30 11. A busbar system according to Claim 10 wherein the mounting arms are provided with mounting holes at the end sections of the receptacles for mounting screws; and

35 mounting screws are inserted into through-holes of the connecting elements and into the mounting holes of the mounting arms of the busbar sections and are screwed into threaded holes located within the carrier plates



12. A busbar system according to any one of Claims 1 to 3, 5, 9 and 11 wherein

the busbar sections are in the shape of a Z with one cross arm acting as the mounting arm and the other cross arm acting as a clamping arm and running at a distance from and parallel to the tops of the carrier plates.

13. A busbar system according to any one of Claims 1 to 3, 5, 9 and 11 wherein

the carrier plates are provided with rows of openings at least between adjacent busbar sections, said openings feeding into cable ducts in the bottoms of the carrier plates, said ducts connecting the openings and being aligned perpendicularly to the busbar sections and to the longitudinal sides of the carrier plates.

14. A busbar system substantially as hereinbefore described with reference to the accompanying drawings.

DATED this 27th day of February 1991  
RITTAL-WERK RUDOLF LOH GmbH & CO. KG.

By their Patent Attorneys  
GRIFFITH HACK & CO.



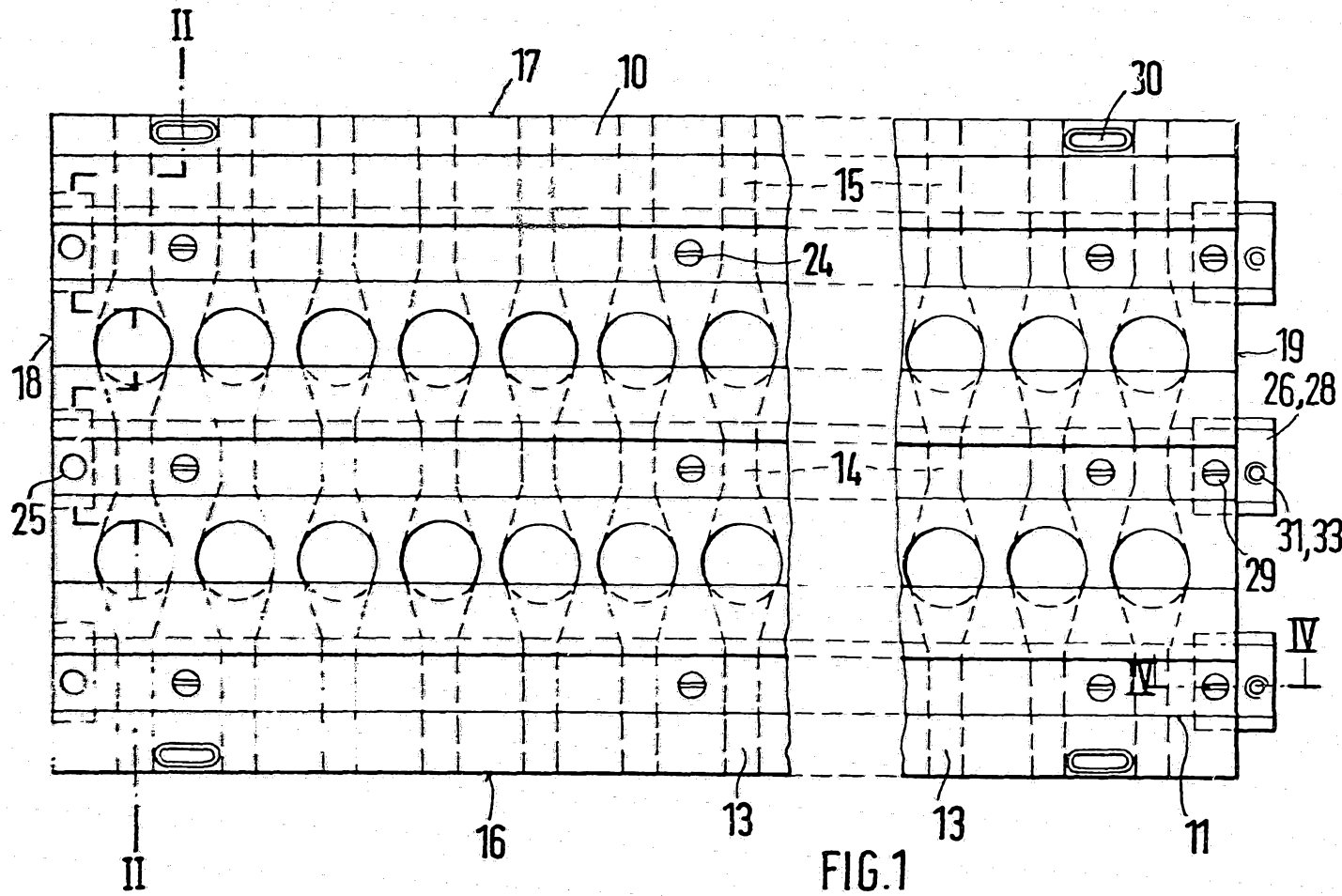


FIG. 1

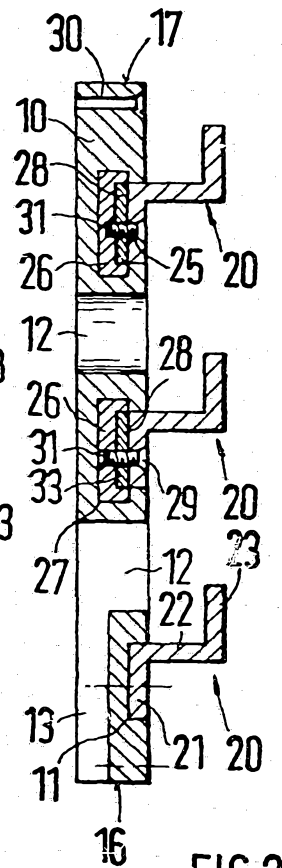


FIG. 2

