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(54) **Terminal block assembly for connecting motor-actuated compressors, particularly for refrigerators**

(57) A terminal block assembly for connecting motor-actuated compressors, particularly for refrigerators, comprising a containment body (20) made of electrically insulating material which supports all the electrical connections between the motor starter, the motor protector, the terminals for connection to a fusite connector of a

motor-actuated compressor (24) and a front terminal block (2) for the connection of the mains cable and of the service cables. Means (21) are also provided for the engagement of the containment body (20) on a fusite connector housing body (23) associated with the motor-actuated compressor (24).

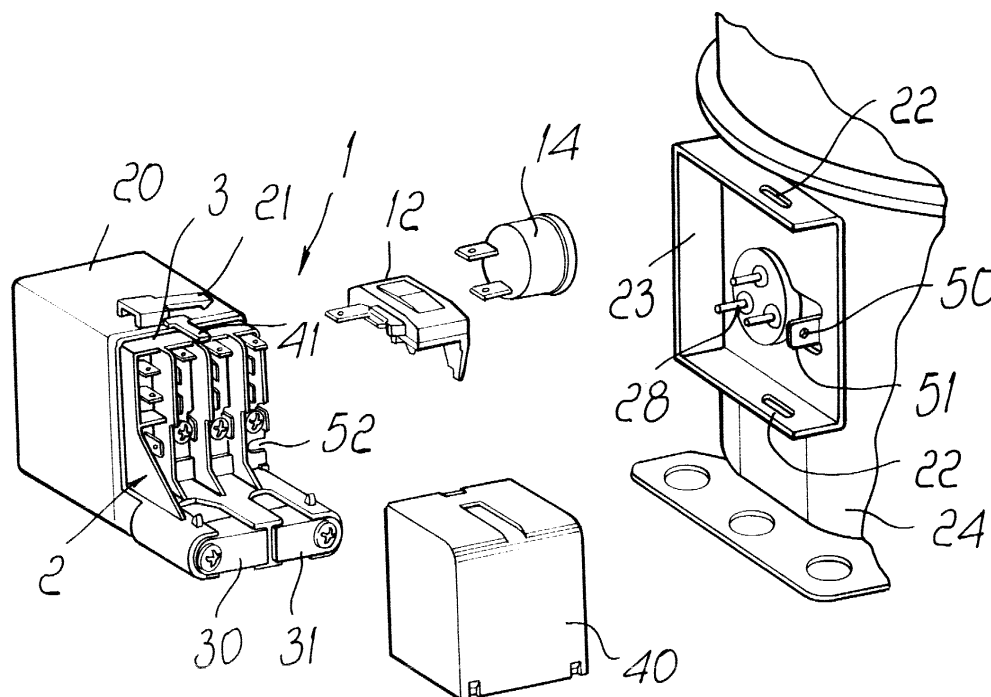


Fig. 1

Description

[0001] The present invention relates to a terminal block assembly for connecting motor-actuated compressors, particularly of household refrigerators, but also for commercial refrigeration applications.

[0002] It is known that motor-actuated compressors currently use terminal blocks which are designed to provide the electrical connection to the fusite connector of the compressor together with the connection of the auxiliary components such as the motor starter, the thermal motor protector, and the terminals that provide electrical coupling to the fusite connector.

[0003] These connections are produced only partially by means of contact laminae provided on the terminal block assembly and must be complemented by external cables in order to complete the connections.

[0004] The external cables can cause electrical contact problems and also require additional labor during assembly.

[0005] Another problem suffered by the solutions of the prior art is constituted by the fact that they are generally bulky and do not offer good contact accessibility directly on the front part, i.e., on the face that ends up being directed toward the user, once the terminal block has been coupled to the fusite connector of the motor-actuated compressor.

[0006] The aim of the invention is to eliminate the above drawbacks by providing a terminal block assembly for connecting motor-actuated compressors, particularly for household refrigerators (but also for commercial refrigeration applications), which allows to integrate all the electrical connections between the motor starter, the motor protector, the terminals and the terminal block, providing an assembly which is extremely compact and easy to fit.

[0007] Within the scope of this aim, an object of the invention is to provide a terminal block assembly in which all the terminals, which can be of the screw or Faston type, can be reached from the front side of the compressor, i.e., from the side that is normally visible on the rear of the refrigerator cabinet.

[0008] Another object of the present invention is to provide a terminal block which is fully pre-wired and requires exclusively the insertion of the supplied motor protector in the corresponding seat, which is preset for the 3/4 protector and/or for the 4TM protector.

[0009] Another object of the present invention is to provide a terminal block assembly for connecting motor-actuated compressors, particularly for household refrigerators (but also for commercial refrigeration applications), which can be easily obtained starting from commonly commercially available elements and materials and is also competitive from a purely economical point of view.

[0010] This aim, these objects and others which will become apparent hereinafter are achieved by a terminal block assembly for connecting motor-actuated com-

pressors, particularly for refrigerators, according to the invention, characterized in that it comprises a containment body made of electrically insulating material which supports all the electrical connections between the motor starter, the motor protector, the terminals for connection to a fusite connector of a motor-actuated compressor and a front terminal block for the connection of the mains cable and of the service cables, means being further provided for the engagement of said containment body on a fusite connector housing body associated with said motor-actuated compressor.

[0011] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred but not exclusive embodiment of a terminal block assembly for connecting motor-actuated compressors, particularly for refrigerators, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of the terminal block assembly, composed of a terminal block body and of a containment body, according to the invention;

Figure 2 is a perspective view of the terminal block body with contact laminae preset for the 4TM motor protector;

Figure 3 is a perspective schematic view of the terminal block with the 4TM motor protector applied;

Figure 4 is a schematic perspective view of the terminal block body with the contact lamina for the 3/4 motor protector;

Figure 5 is a schematic perspective view of the terminal block assembly with the 3/4 motor protector applied.

[0012] The terminal block assembly for connecting motor-actuated compressors, particularly for household refrigerators (but also for commercial refrigeration applications), according to the invention, generally designated by the reference numeral 1, comprises a terminal block body 2 (Figure 1) which has (Figure 2) a wall 3 on which there are pre-wired contact laminae 4 which have, on the front face (Figure 3), Faston connectors 5 for the connection of the electric power supply cables and of the various service cables.

[0013] On the rear side, i.e., on the side that lies opposite the front side (Figure 2), the terminal block body 2 forms a seat 10 for accommodating a motor starter, which can be of the PTC type (as shown in Figure 2) adapted exclusively for household refrigerators or, as an alternative, can be of the electronic type, adapted both for household refrigerators and for commercial refrigeration applications, and is also provided with contact laminae for the thermal motor protectors, which can be of two different kinds.

[0014] For this purpose there is a first lamina, designated by the reference numeral 11, for the connection of the 4TM motor protector 12 (shown in Figure 3) or, as

an alternative, there is a second contact lamina 13 (Figure 4) for the application of the 3/4 motor protector, designated by the reference numeral 14 in Figure 5.

[0015] A containment body 20 (Figure 5) can be coupled to the wall 3 of the terminal block body 2 (Figure 3) and is provided with elastic teeth 21 for engagement in the slots of a fusite connector housing 23 which is part of the body of the motor-actuated compressor 24 (Figure 1) and can be disengaged by using a tool.

[0016] On the open face of the containment body 20 there are also the contacts, designated by the reference numeral 26 (Figure 3), that mate with the fusite connector pins, designated by the reference numeral 28 (Figure 1).

[0017] In this manner it is possible to stably couple the terminal block 2 to the motor-actuated compressor 24 so that the front face of the terminal block can be accessed directly and frontally.

[0018] The front face of the terminal block 2 is provided with a first cable clamp 30 and with a second cable clamp 31 (Figure 1), which are used to clamp respectively the mains cable by means of a dedicated cable clamp and to clamp the service cables by means of a second adapted cable clamp.

[0019] It is also possible to provide a cover 40 (Figure 1) which fits on the front face of the body 2, closes the entire terminal block with respect to the outside and is retained by a tooth 41 provided on the body 2 which can be disengaged by using a tool.

[0020] A further characteristic of the invention consists in that the earth connection between the terminal block 2 and the compressor 24 can be provided by tightening a single screw which engages in a threaded seat 50 (Figure 1) of an earth contact 51 provided on the fusite connector housing and can be fitted in a notch 52 which is formed correspondingly on the lamina of the earth contact which can be accessed frontally on the terminal block.

[0021] In this case also, it is therefore possible to tighten the contacts very rapidly.

[0022] From the above description it is evident that the invention achieves the intended aim and objects, and in particular the fact is stressed that all the screw and Faston terminals can be easily reached from the front side of the compressor and that the clamping of the cables is ensured by two cable clamps located below the terminal block.

[0023] Assembling the assembly merely entails inserting the supplied motor protector in the corresponding seat, with its automatic internal electrical connection.

[0024] Mounting the assembly on the compressor further comprises, in a single operation, electrical connection on the fusite connector, its engagement to the fusite connector housing body and its coupling to the earth contact arranged on the fusite connector housing.

[0025] This connection is ensured by the tightening of the corresponding screw.

[0026] Once the electrical connections have been

provided on the terminal block before or after fitting the terminal block to the compressor, the cover for closing the terminal block is rapidly placed in its seat and is retained by the tooth 41 formed in the upper part of the wall 3 of the terminal block body 2 (Figure 1).

[0027] During disengagement, any opening of the cover occurs only by applying thereto an outward force while lifting the tooth 41 by using a tool, whereas the extraction of the terminal block assembly occurs by applying an outward force and by disengaging in succession, by using a tool, the two elastic teeth 21 arranged on the upper and lower sides of the containment body 20 which is associated with the terminal block body 2.

[0028] With the above-described solution, a reduction in overall costs due to the structural simplifications is achieved and also by the fact that all the electrical connections have been integrated in a single component, without therefore having to resort to loose cables or the like.

[0029] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0030] All the details may also be replaced with other technically equivalent elements.

[0031] In practice, the materials employed, as well as the contingent shapes and the dimensions, may be any according to requirements.

[0032] 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. A terminal block assembly for connecting motor-actuated compressors, particularly for refrigerators, characterized in that it comprises a containment body made of electrically insulating material which supports all the electrical connections between the motor starter, the motor protector, the terminals for connection to a fusite connector of a motor-actuated compressor and a front terminal block for the connection of the mains cable and of the service cables, means being further provided for the engagement of said frame to a fusite connector housing body associated with said motor-actuated compressor.
2. The terminal block assembly according to claim 1, characterized in that said terminal block body comprises a wall which has, on the front face, Faston connectors of pre-wired contact laminae for the connection of the power supply cables and of the service cables, the seat for accommodating a PTC

or electronic motor starter and contact laminae for thermal motor protectors being formed on the rear side of said wall.

3. The terminal block assembly according to claim 1, characterized in that it comprises a first lamina for the connection of a 4TM motor protector or, as an alternative, a second lamina for the application of a 3/4 motor protector. 5
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4. The terminal block assembly according to claim 1, characterized in that it comprises a containment body which can be coupled to said terminal block body and is provided with elastic teeth for engagement in slots of said fusite connector housing body which is fixed on said motor-actuated compressor. 15
5. The terminal block assembly according to claim 1, characterized in that it comprises, on the front face of said terminal block body, a first cable clamp and a second cable clamp for clamping the mains cable and the service cable, respectively. 20
6. The terminal block assembly according to claim 1, characterized in that it comprises a cover which can be coupled on the front face of said terminal block body, said cover being retained by a tooth which is associated with said terminal block body. 25
7. The terminal block assembly according to claim 1, characterized in that it comprises, on said fusite connector housing body, an earth contact provided with a threaded seat for the engagement of a screw which can engage in a notch formed corresponding in an earth contact lamina provided on said terminal block body. 30
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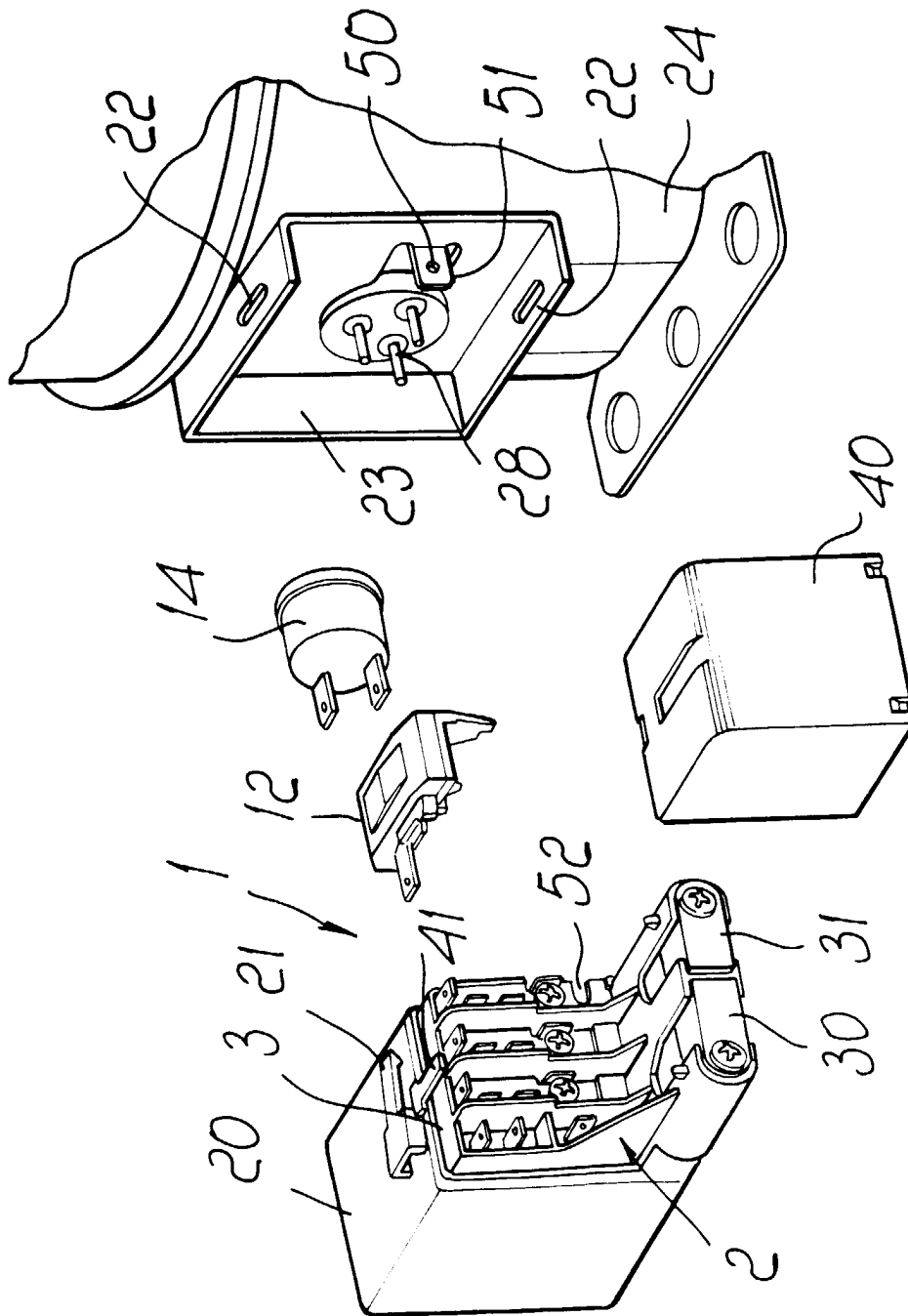


Fig. 1

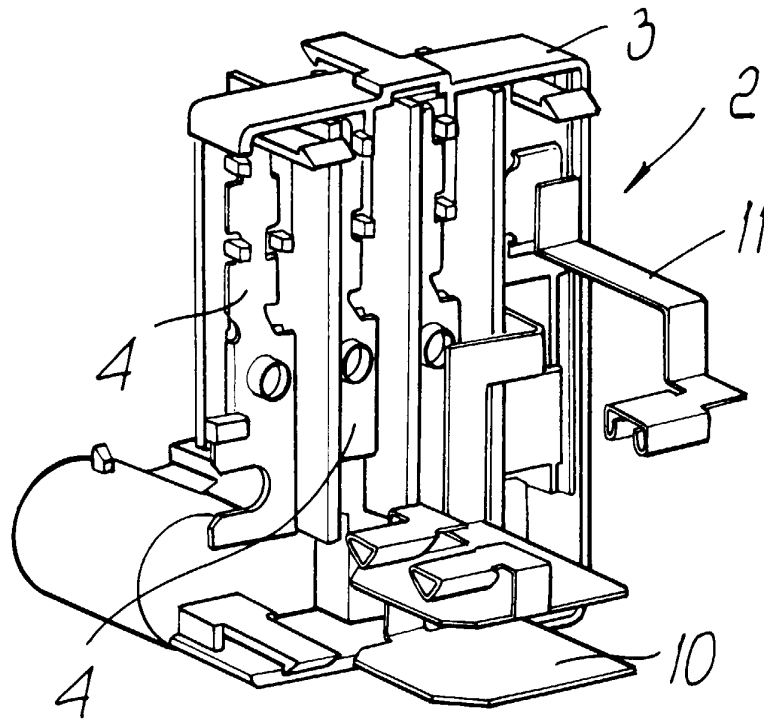


Fig. 2

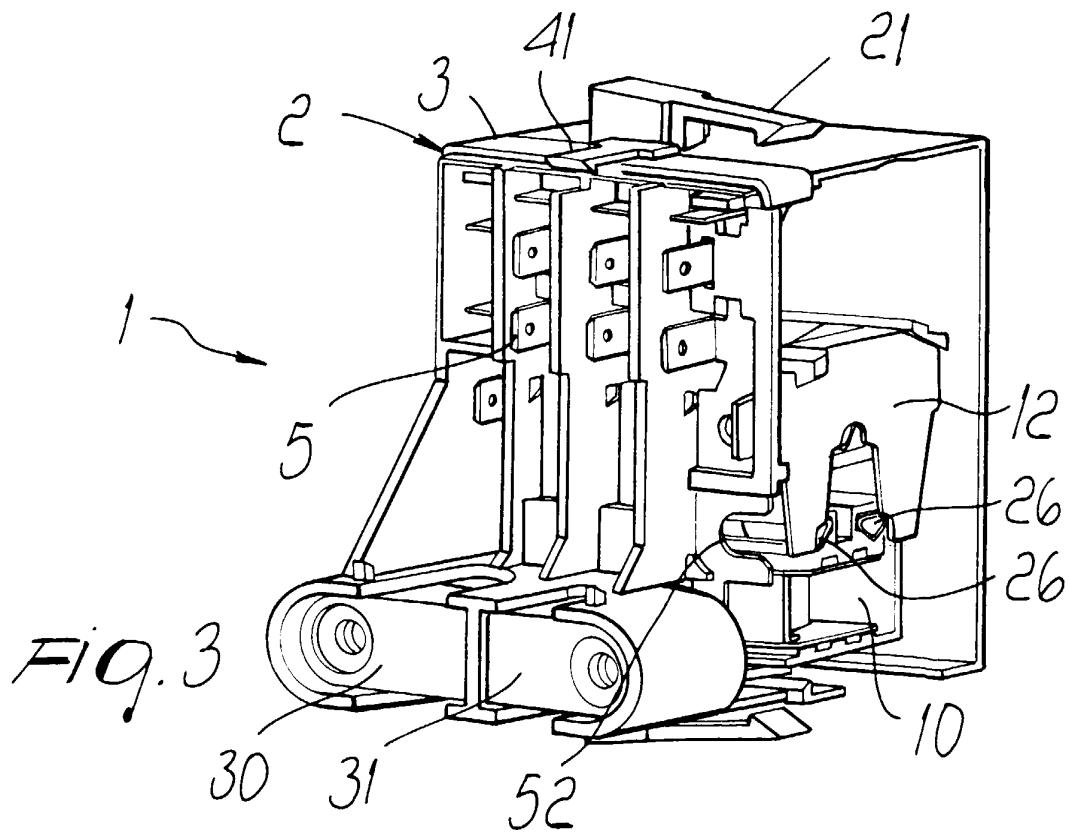


Fig. 3

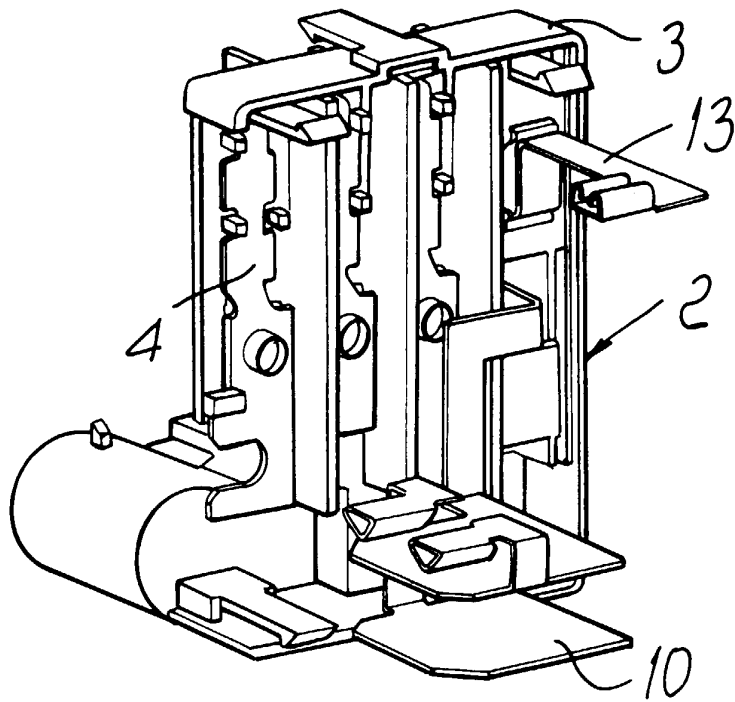


Fig. 4

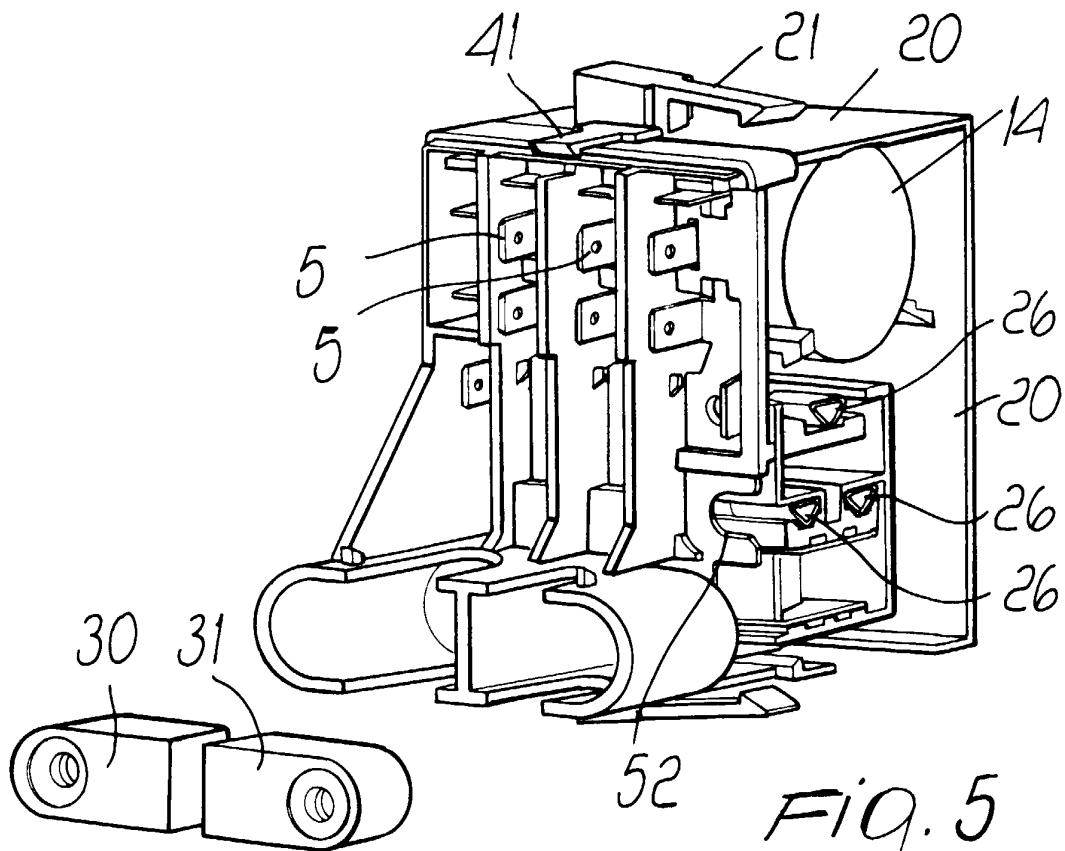


Fig. 5



European Patent
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Application Number
EP 99 12 5333

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 May 2000	Examiner Boets, A
CATEGORY OF CITED DOCUMENTS		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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EUROPEAN SEARCH REPORT

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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