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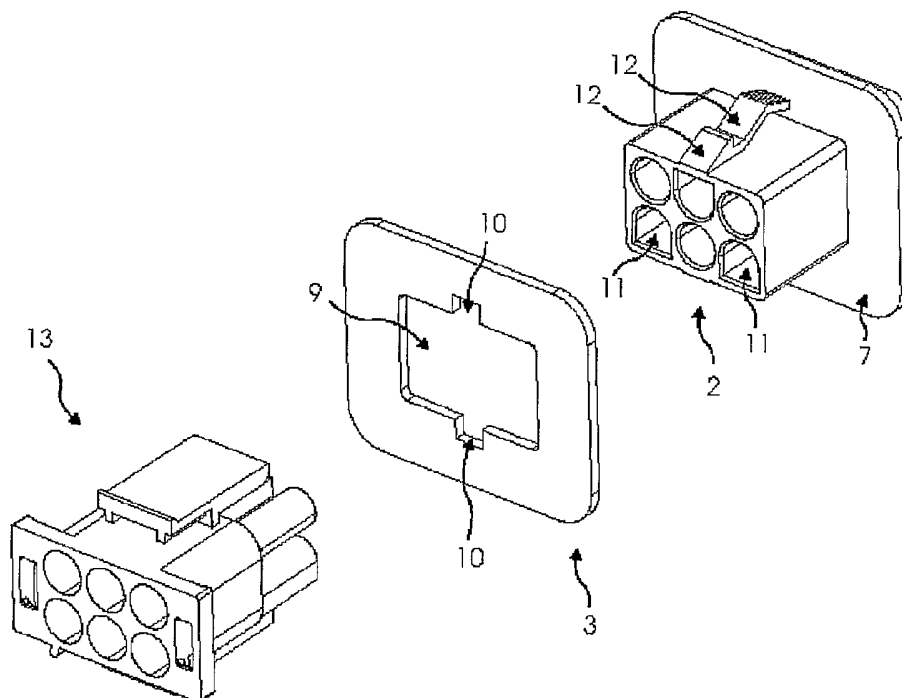
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(54) Title: A COOLING DEVICE



(57) Abstract: This invention relates to a cooling device (1) comprising a connector (2), which is used to perform the electrical connections and fastened to the inner and outer liners (3,4) forming the body (8) of the said cooling device (1) in such a way that sealing is achieved.



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Description

A COOLING DEVICE

- [001] This invention relates to a cooling device comprising a connector which is used to perform the electrical connections and fastened to the liners forming the body of the cooling device in such a way that sealing is achieved.
- [002] In order to perform a better cooling process with less energy consumption, it is necessary to improve the insulation properties of bodies of the cooling devices. For that reason, after the insulation material is filled into the insulation volume between the inner and outer liners of the body, the insulation volume is sealed. For the sealed body not to lose its insulation properties, special attention should be given to the sealing of the apertures formed on the inner and outer liners, for instance the passageways of the cables. The cables brought to the location of use inside the insulation volume are connected to the outside of the insulation volume while their sealing is ensured by means of one or more than one connector at the said location.
- [003] In the afore-mentioned applications, the connectors (100) positioned to the recesses (151) formed on the liners (150) incorporate claws (101) whereby they are fastened to the said liners (150). If it is desired to fasten the connectors (100) to more than one component at more than one point, the number and width of the recesses (151) on the liners (150) are arranged so that the claws (101) can pass through. Sealing problems may arise as the width of the recesses (151) increases. For example, when PU is injected to the insulation volumes between the liners (150) as the insulation material, the mentioned PU material leaks out of gaps at the recesses (151) where the connector (100) is positioned (Figure 1).
- [004] In the current state of the art, in the United States Patent, US 5248196, a description is given of a connector whereby, at the sections where electric connections are located, it is achieved that connections are established and the sealing is ensured.
- [005] In the current state of the art, in the United States Patent, US 5985189, a description is given of an assembly method for a cabinet wherein sealing is achieved at the sections where connectors and electric connections are located.
- [006] In the current state of the art, in the United States Patent, US 5112241, a description is given of a gasket for electric connectors.
- [007] In the current state of the art, in the United States Patent Document US 6159041, a description is given of an electric connector assembly comprising a connector body, more than one electric terminal, a cover and a sidewall.
- [008] The aim of the present invention is the realization of a cooling device comprising a connector which is fastened to the liners forming the body of the said cooling device in such a way that it does not detach from the mentioned liners and that the sealing of the

insulation volume between the liners is ensured and, whereby electric connections are established.

- [009] The cooling device designed to fulfill the objectives of the present invention is illustrated in the attached figures where:
- [010] Fig.1 – is a perspective view of a connector fastened to a liner as it took place in the prior art.
- [011] Fig.2 – is a schematic view of a cooling device.
- [012] Fig.3 – is a perspective view of a connector, mounted onto an inner liner, which has two lockers, one in the form of a claw and the other in the form of a bridge.
- [013] Fig.4 – is a side view of a connector counterpart and a connector, which has two lockers, one in the form of a claw and the other in the form of a bridge.
- [014] Fig.5 – is a perspective view of a liner with two fastening holes, a connector counterpart and a connector, which has two lockers, one in the form of a claw and the other in the form of a bridge, wherein they are not mounted to each other.
- [015] Fig.6 – is a front view of a connector.
- [016] Fig.7 – is a top view of a connector.
- [017] Fig.8 – is a top view of a connector counterpart and a connector, which are mounted onto a liner.
- [018] Fig.9 – is a top view of a connector counterpart and a connector, which are mounted onto more than one liner.
- [019] Fig.10 – is a perspective view of a liner with one fastening hole, a connector counterpart and a connector, which has two lockers, one in the form of a claw and the other in the form of a bridge, wherein they are not mounted to each other.
- [020] Fig.11 – is a perspective view of a connector, mounted onto an inner liner, which has two lockers in the form of a claw.
- [021] Fig.12 – is a side view of a connector having more than one locker in the form of a claw and more than one locker in the form of a bridge.
- [022] Elements shown in figures are numbered as follows:
1. Cooling device
 2. Connector
 3. Inner liner
 4. Outer liner
 5. Insulation volume
 6. Cable
 7. Wall
 8. Body
 9. Connector recess
 10. Fastening hole

- 11. Terminal recess
- 12. Locker
- 13. Connector counterpart

[023] The cooling device (1) comprises a body (8), an inner liner (3) forming the inner surfaces of the body (8), an outer liner (4) forming the outer surfaces of the body (8), an insulation volume (5) between the inner liner (3) and the outer liner (4), filled with insulation material, a connector (2) used to establish the electric connections, which is fastened to the inner liner (3) and/or to the outer liner (4) in such a way that they do not detach from one another while sealing of the insulation volume (5) is achieved, one or more than one cable (6) used to transfer the supply voltage to the connector (2) and, a connector counterpart (13) fastened onto the connector (2).

[024] The inner liner (3) comprises a connector recess (9) where the connector (2) is to be positioned into, one or more than one fastening holes (10) on the connector recess (9), used to fix the connector (2).

[025] The connector (2) comprises a wall (7) whereby it rests on and is attached to the inner liner (3), one or more than one terminal recess (11) opened to the both sides of the inner liner (3), where the cables (6) are connected, at least two lockers (12) at same level with each other, positioned one after another, which can pass through the same fastening hole (10) by bending and fit to the mentioned fastening hole (10) such that sealing is ensured and, which are used to fasten the connector (2) to at least two components such as the inner liner (3) or the outer liner (4) or the connector counterpart (13).

[026] In the preferred embodiment of the present invention, two lockers (12) are utilized, one is in the form of a claw and the other in the form of a bridge (Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 10).

[027] In the application of the present invention, after the connector (2) is fitted to the connector recess (9) on the inner liner (3) such that the inner liner (3) is positioned between the first locker (12) in the form of a bridge and the wall (7), the cables (6) inside the insulation volume (5) are attached to the terminal recesses (11) by means of the terminals located at their ends. After the cables (6) are connected, the inner liner (3) and the outer liner (4) are attached to each other and the body (8) is formed by injecting insulation material there between. During the mentioned procedure, insulation material can leak only from the connector recess (9). However, the possibility of a leakage of the insulation material is minimized since a connector (2) with the same form of the connector recess (9) is placed into the said connector recess (9) and since a locker (12) is positioned into the fastening hole (10). After the body (8) is formed, the connector counterpart (13) is fastened to the connector (2) by means of the second locker (12) in the form of a claw so that the inner liner (3) lies between

them. Thereby, only terminal recesses (11) appear on the inner liner (3) of the body (8) and by means of the terminals connected to the said terminal recesses (11), supply voltage connection necessary for some components using electricity is established.

[028] In another embodiment of the present invention, two lockers (12) in the form of a claw are utilized (Figure 11).

[029] In another embodiment of the present invention, two lockers (12) in the form of a bridge are utilized (Figure 12, Figure 9).

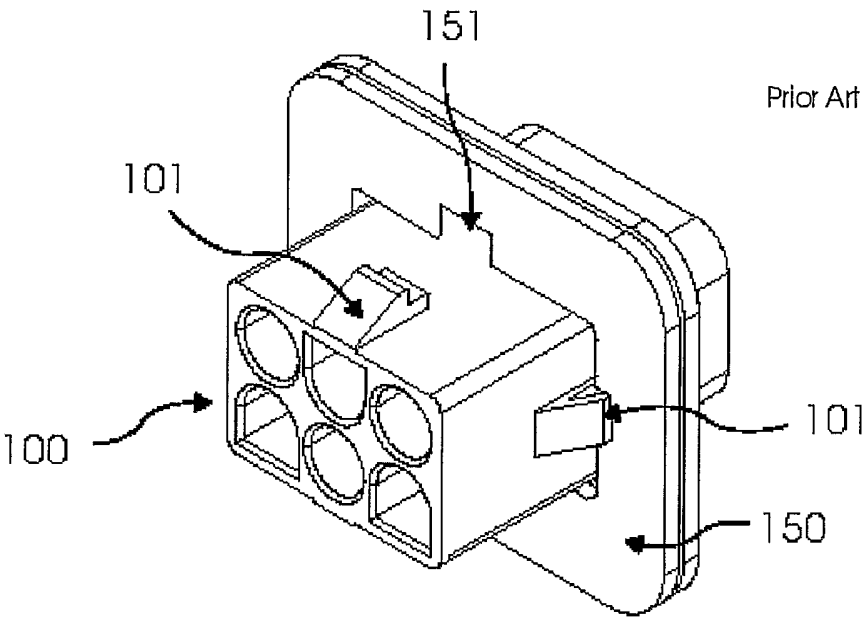
[030] In another embodiment of the present invention, the locker (12) is manufactured from an elastic material. Thereby, the locker (12) passes through the fastening hole (10) by bending and after it passes through, it ensures the fastening by returning to its original shape.

[031] In the embodiment of this present invention, insulation is achieved without using an additional plastic gasket. Since the lockers (12) in the form of a claw and bridge are positioned consecutively, the production and use of the connector (2) is streamlined. Moreover, since the lockers (12) in the form of a claw and bridge can pass through the fastening hole (10) one after another, an additional hole is not necessary and the insulation material inside the insulation volume is prevented from leaking to the outside of the inner liner (3). Thus, apertures between the connector (2) and the inner liner (3) are minimized and advantages are gained concerning the sealing of the cooling device (1).

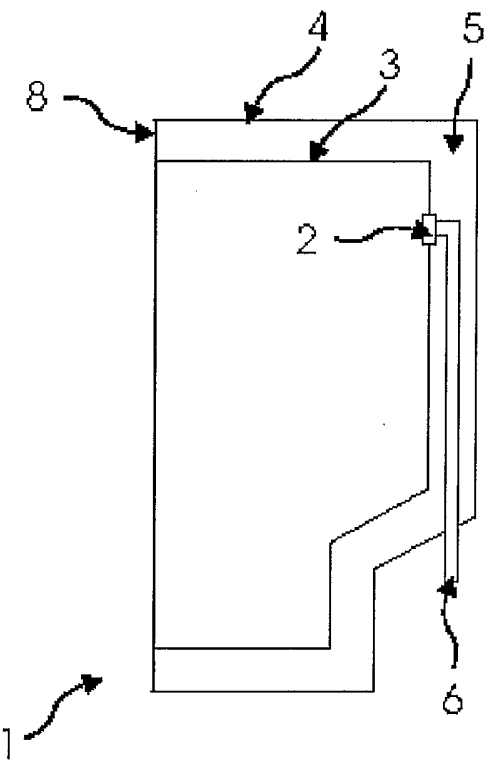
Claims

- [001] A cooling device (1) comprising a body (8) wherein a cooled volume is created, an inner liner (3) forming the inner surfaces of the body (8), an outer liner (4) forming the outer surfaces of the body (8), an insulation volume (5) between the inner liner (3) and outer liner (4), filled with insulation material, a connector (2) used to establish the electric connections, which is fastened to the inner liner (3) and/or to the outer liner (4) in such a way that they do not detach from one another while sealing of the insulation volume (5) is achieved and, a connector counterpart (13) fastened onto the connector (2); and **characterized by**; an inner liner (3) comprising a connector recess (9) where the connector (2) is to be positioned into, one or more than one fastening holes (10) on the connector recess (9), used to fix the connector (2); a connector (2) comprising at least two lockers (12) at same level with each other, positioned one after another, which can pass through the same fastening hole (10) by bending and fit to the mentioned fastening hole (10) so that sealing is ensured and, which are used to fasten the connector (2) to at least two components such as the inner liner (3) or the outer liner (4) or the connector counterpart (13).
- [002] A cooling device (1) as described in Claim 1, **characterized by** a connector (2) which comprises a locker (12) in the form of a claw.
- [003] A cooling device (1) as described in Claims 1 or 2, **characterized by** a connector (2) which comprises a locker (12) in the form of a bridge.
- [004] A cooling device (1) as described in Claims 1 to 3, **characterized by** a connector (2), which comprises a locker (12) manufactured from an elastic material.
- [005] A cooling device (1) as described in any of the above Claims, **characterized by** a connector (2), which comprises a wall (7) whereby it rests on and is attached to the inner liner (3) or outer liner (4) and, one or more than one terminal recess (11) opened to the both sides of the inner liner (3), where the cables (6) are connected.

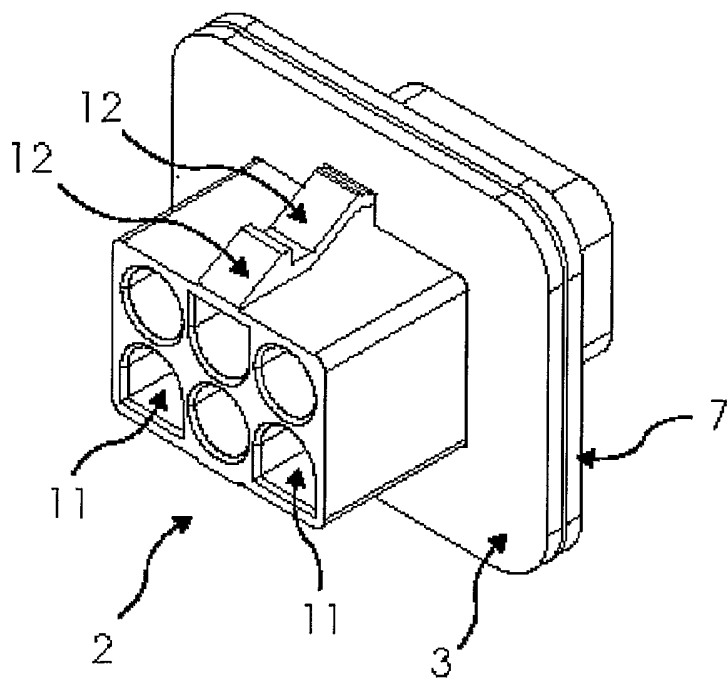
[Fig. 001]



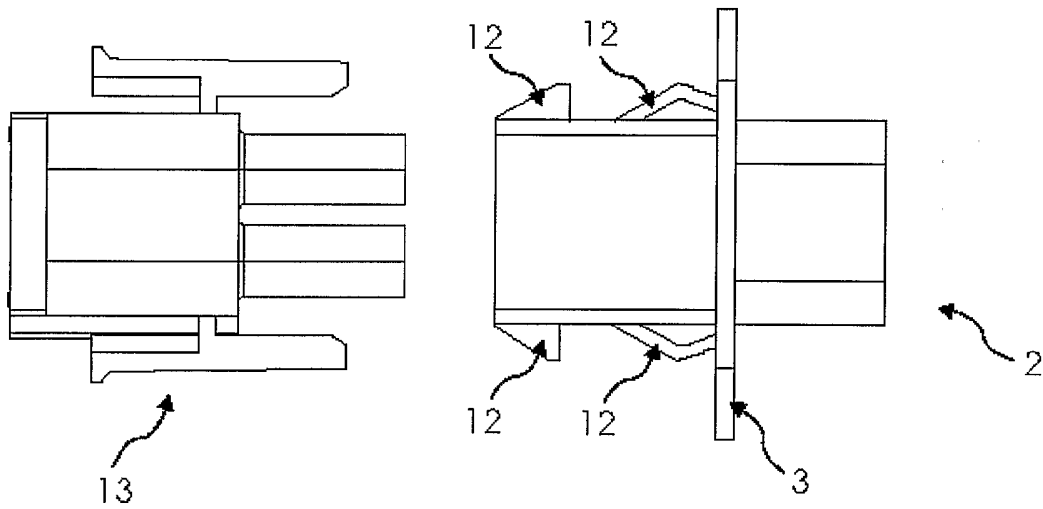
[Fig. 002]



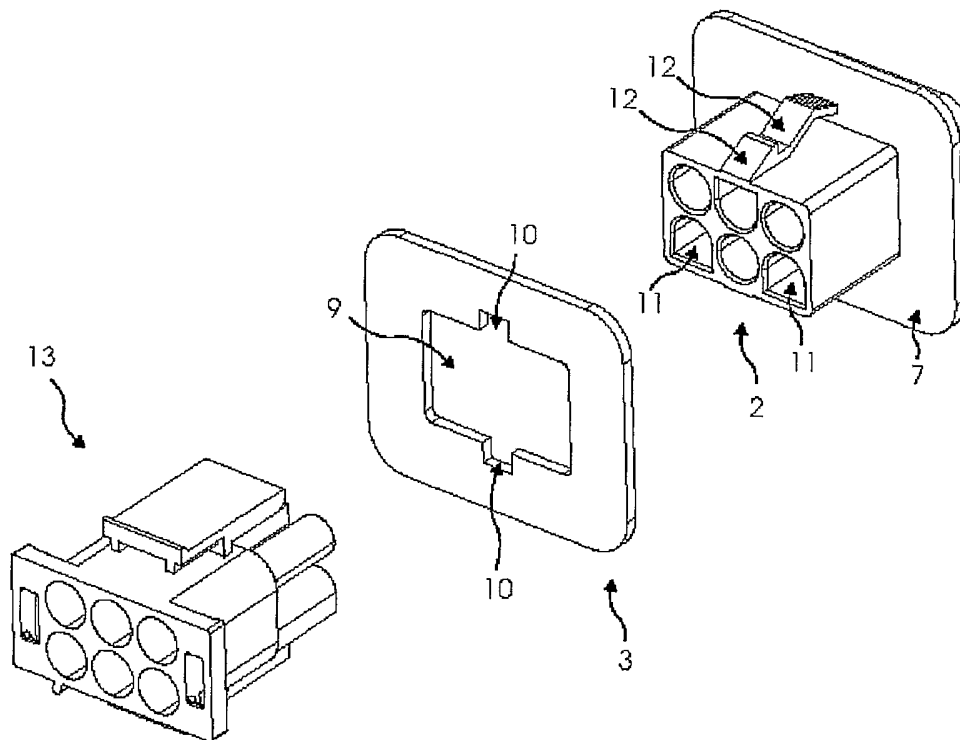
[Fig. 003]



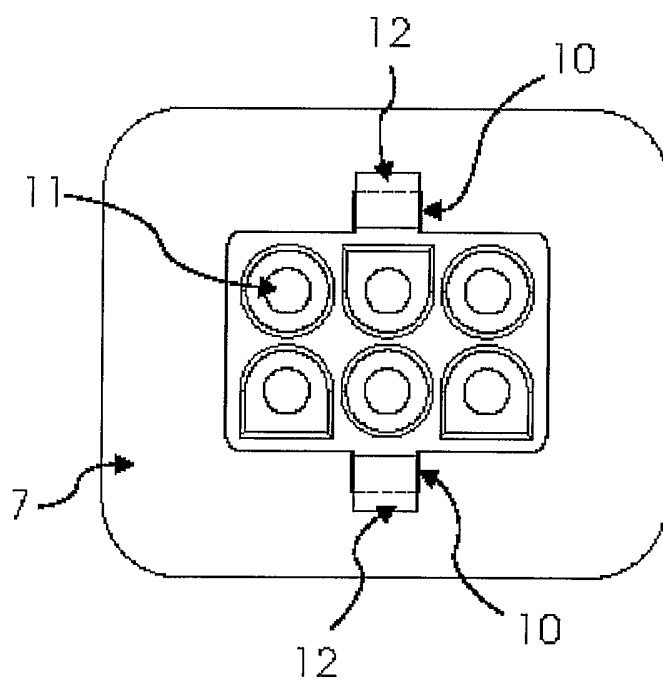
[Fig. 004]



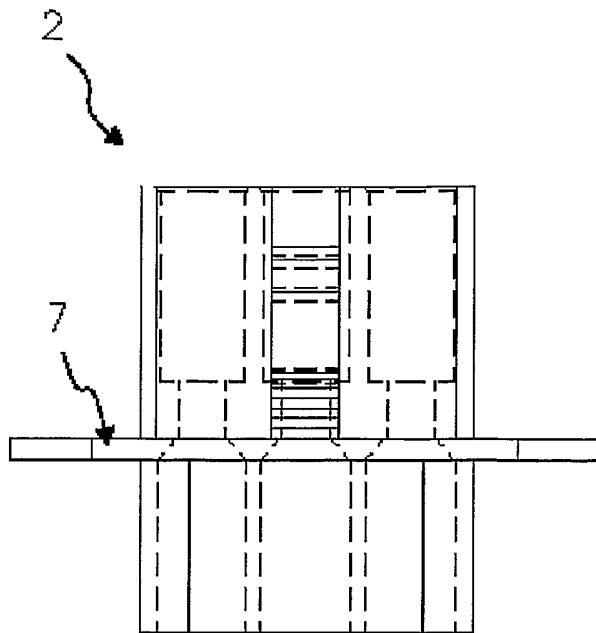
[Fig. 005]



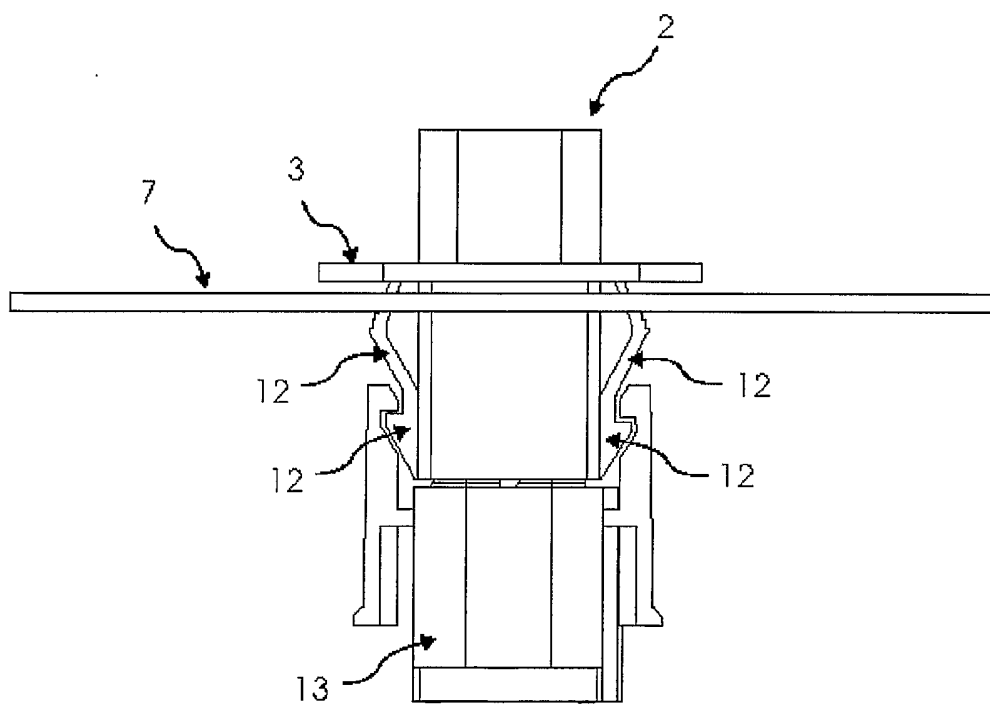
[Fig. 006]



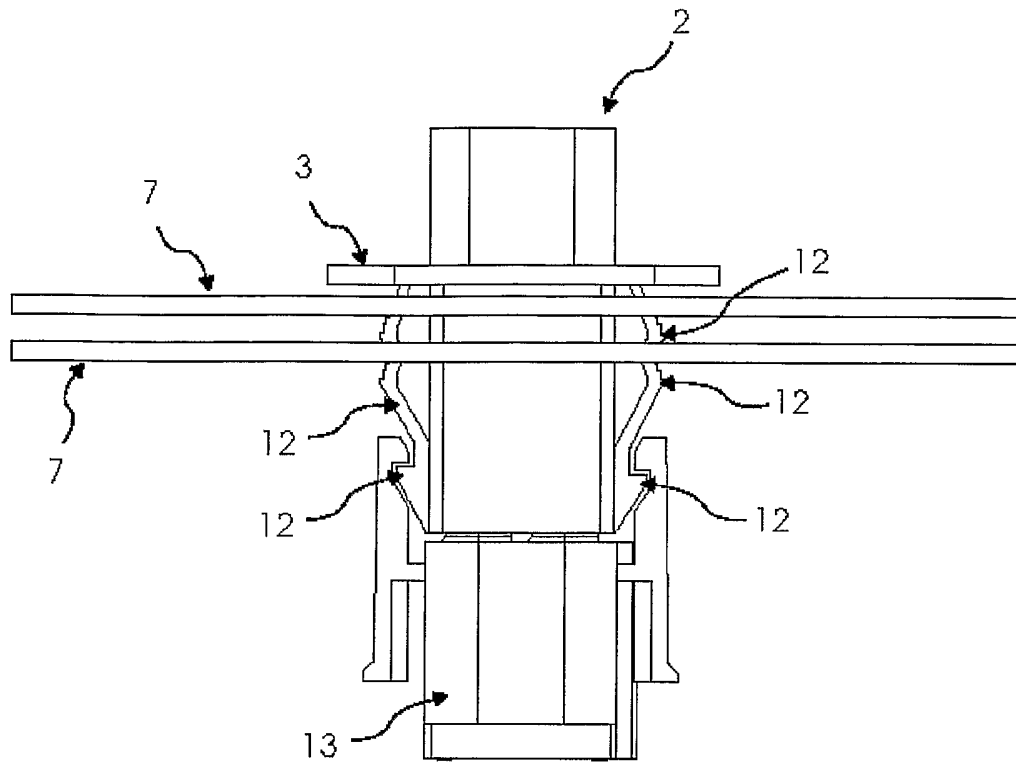
[Fig. 007]



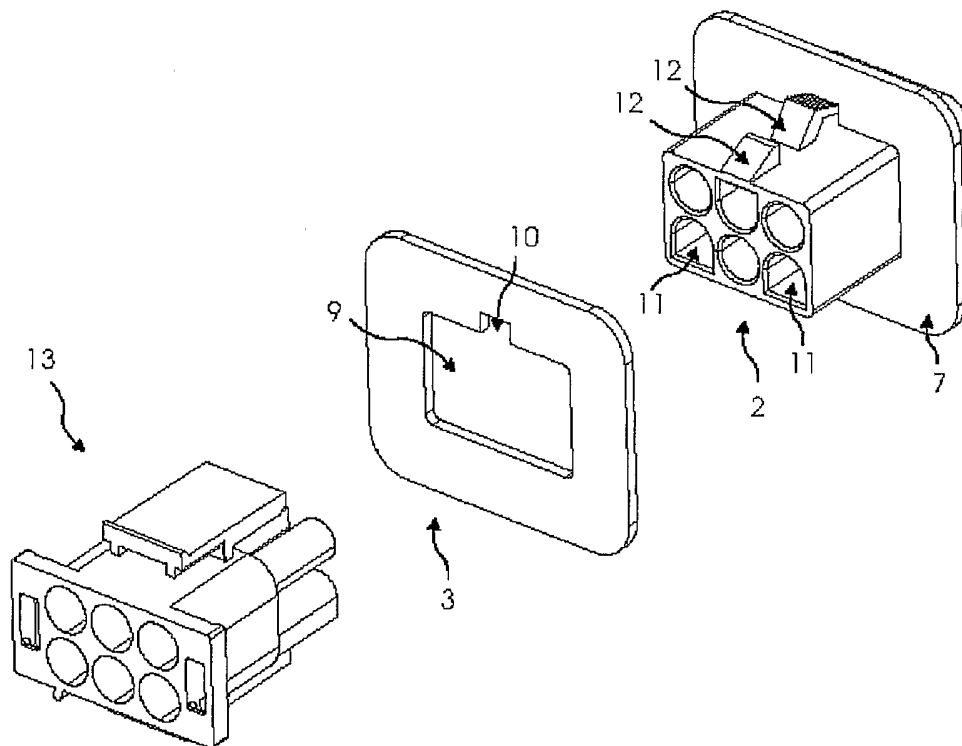
[Fig. 008]



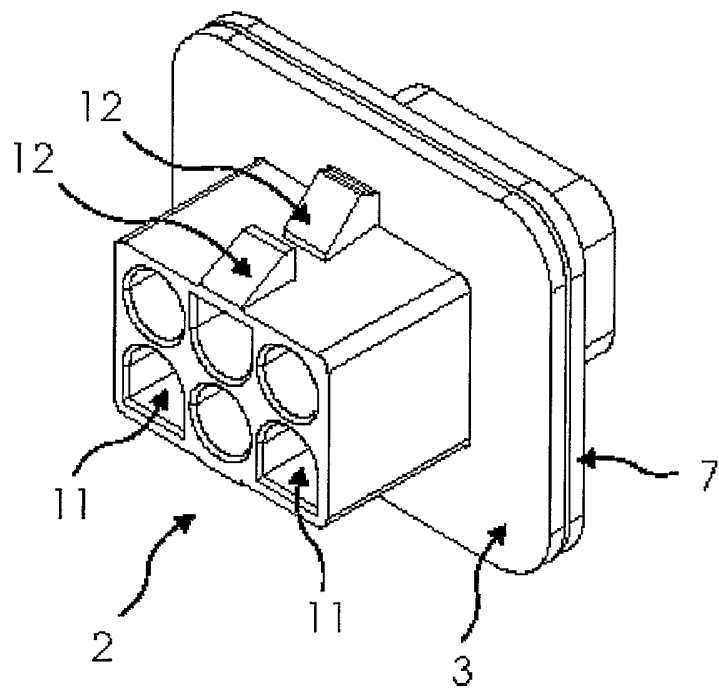
[Fig. 009]



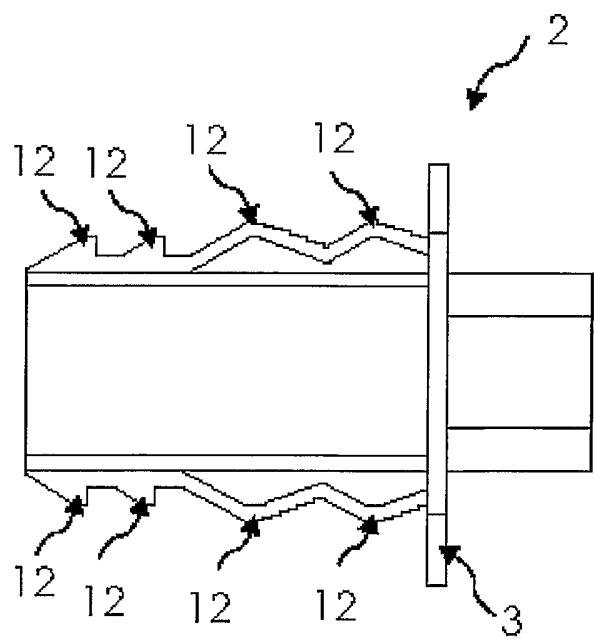
[Fig. 010]



[Fig. 011]



[Fig. 012]



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01R F25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 296 06 772 U1 (WHIRLPOOL EUROPE B.V., AMSTERDAM, NL) 14 August 1996 (1996-08-14) the whole document	1
A	DE 298 23 075 U1 (GROTE & HARTMANN GMBH & CO KG) 4 May 2000 (2000-05-04) abstract; figures 1-3	1
A	US 6 321 446 B1 (IWATA YOSHIFUMI ET AL) 27 November 2001 (2001-11-27) figures 13,14	1
A	US 5 985 189 A (LYNN ET AL) 16 November 1999 (1999-11-16) cited in the application abstract; figures 1-19	
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