



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**07.01.2004 Bulletin 2004/02**

(51) Int Cl.7: **A47L 9/24**

(21) Application number: **03015095.7**

(22) Date of filing: **03.07.2003**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PT RO SE SI SK TR**  
Designated Extension States:  
**AL LT LV MK**

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(30) Priority: **04.07.2002 IT UD20020150**

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(54) **Connector for a domestic appliance such as a vacuum cleaner, a steam generator, an electric broom or suchlike**

(57) Connector (10) for a domestic appliance that comprises a first part (11) associated with the domestic appliance, and a mating second part (20) associated with corresponding current and/or steam generator/feeder members. The first part (11) has a first electric connector (16) and a possible first steam connector (18), while the second part (20) comprises a second electric connector (17) and a possible second steam connector (19). The connector (10) comprises a protection element (30) cooperating with the first electric con-

connector (16) and with the first steam connector (18). The protection elements (30) can be selectively positioned, at the moment when the two parts (11, 20) are coupled, between a first protection position, wherein they cover the first electric connector (16) and the first steam connector (18), and a second connection position, wherein they allow the first electric connector (16) and the first steam connector (18) to be associated with the second electric connector (17) and with the second steam connector (19).

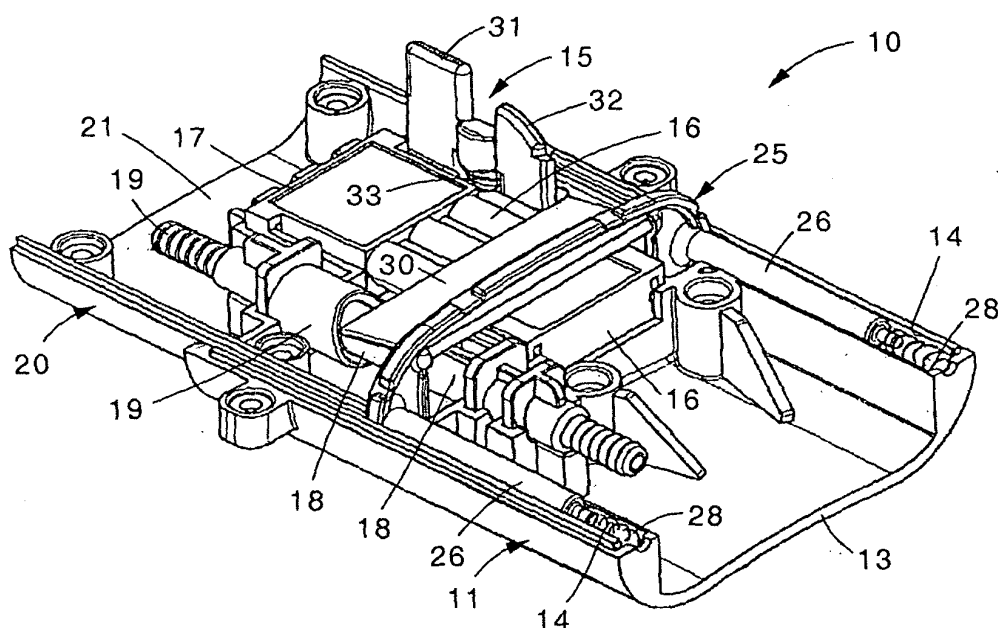


fig. 1

## Description

### FIELD OF THE INVENTION

**[0001]** The present invention concerns a connector for a domestic appliance of the type able to allow the connection of the domestic appliance to electric feed means, by means of electric connection means, which supply energy to activate the domestic appliance, and/or to steam generation means, by means of steam connection means. To be more exact, the connector according to the present invention comprises protection means able to be selectively positioned in order to protect the electric connection means and/or the steam connection means when they are not being used.

### BACKGROUND OF THE INVENTION

**[0002]** Connectors for domestic appliances are known, such as vacuum cleaners, electric brooms, steam suction devices, irons or suchlike, able to allow the connection between the domestic appliance, or part of it, and members to generate steam, if provided, or to feed electric energy.

**[0003]** Such connectors usually have a first part, for example male, associated with the domestic appliance, and a second part, for example female, associated with the generator/feeder members. These two parts are selectively coupled together to determine the passage of the steam and/or the electric current from the respective generator/feeder means to the corresponding pipes, or to the contacts, of the domestic appliance.

**[0004]** When they are not being used, the contacts of the connectors are uncovered and therefore particularly subject to dust, humidity, or other external agents which compromise or at least condition the correct functioning thereof.

**[0005]** Moreover, since they are normally uncovered, the connectors are more easily and quickly subject to oxidation and wear, thus increasing the maintenance costs of the domestic appliance.

**[0006]** Another disadvantage is that such contacts, especially electric contacts, if accidentally touched, can cause physical injury to the user.

**[0007]** The present Applicant has devised and embodied the present invention to overcome the shortcomings of the state of the art, and to obtain other advantages.

### SUMMARY OF THE INVENTION

**[0008]** The present invention is set forth and characterized essentially in the main claim, while the dependent claims describe other innovative characteristics of the invention.

**[0009]** One purpose of the present invention is to achieve a connector to connect a domestic appliance to members to generate electricity and/or steam, suitable

to constantly protect, also during non-use, the electric and steam connection means from the dust, the humidity or other external agents which can compromise the correct functioning of the domestic appliance and partly put at risk the safety of the user.

**[0010]** In accordance with this purpose, the device according to the present invention comprises a first part, for example female, associated with the domestic appliance, and provided with first electric connection means and possible first steam connection means, and a mating second part, for example male, associated with the members which generate/feed the current and possibly steam, equipped with second electric connection means and possible second steam connection means. The first part can be selectively associated with the second part and attachment means of a conventional type, for example trigger, bayonet or otherwise, are provided to keep the first part temporarily associated with the second part.

**[0011]** According to a characteristic feature of the present invention, the connector also comprises protection means cooperating with the first electric connection means and with the first steam connection means. The protection means can be selectively positioned when the two parts are coupled together, between a first protection position, wherein they cover the first electric connection means and the first steam connection means associated with the domestic appliance, and a second connection position, wherein they allow the first electric connection means and the first steam connection means to be associated with the respective and mating second electric connection means and second steam connection means.

**[0012]** According to a preferential form of embodiment, the protection means are of the pivoting type and are associated with opening/closing means. The opening/closing means are provided with trolley means mounted able to slide on the first part, and contrasting means associated with the second part, to make the trolley means slide longitudinally with respect to the first part, so that the protection means, by pivoting with respect to an axis, are taken to the position wherein they allow the connection. Elastic means are also provided, arranged in cooperation with the trolley means, so as to return the latter to their initial position, wherein the protection means are in their protection position.

**[0013]** Thanks to the protection means, and their relative positioning, the connector according to the present invention provides protection to the first electric connection means and the first steam connection means when the two parts are not associated with each other, thus preventing dust or other impurities from infiltrating and compromising the functioning of the domestic appliance.

**[0014]** The protection means also prevent possible and risky accidental contacts on the part of a user with the first electric connection means and possible first steam connection means.

**[0015]** Moreover, the connector according to the present invention is simple to use, since the protection means are automatically positioned at the moment when the two parts are connected, so that no intervention is necessary on the part of the operator on said means, before and after using the domestic appliance.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0016]** These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example, with reference to the attached drawings wherein:

- fig. 1 is a three-dimensional view, partly in section, of a connector for domestic appliances in an associated condition;
- fig. 2 is a lateral section of the connector in fig. 1 in a dis-associated condition;
- fig. 3 is a lateral section of the connector in fig. 1 in a first intermediate condition;
- fig. 4 is a lateral section of the connector in fig. 1 in a second intermediate condition;
- fig. 5 is a lateral section of the connector in fig. 1 in an associated condition.

#### DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT OF THE INVENTION

**[0017]** With reference to fig. 1, a connector 10 according to the present invention is of the type able to be applied to a domestic appliance, of a conventional type and not shown in the drawings, for example a steam vacuum cleaner, and comprises a first female part 11 and mating second male part 20, able to be selectively coupled together, and an attachment element 15 which keeps the first 11 and second 20 parts temporarily coupled together.

**[0018]** The first part 11 is associated with the operating part of the domestic appliance, and comprises a rigid structure 13 with a substantially annular transverse section, inside which a first electric connector 16, male, and a first steam connector 18, also male, are arranged.

**[0019]** A trolley 25 is associated in sliding manner to the inner part of the rigid structure 13, and is provided at the sides with two rods 26, able to slide inside mating guides 14 made inside the rigid structure 13, and with an annular frame 27 mating in shape with the rigid structure 13 and normally arranged near the entrance to the first part 11.

**[0020]** A protection tongue 30 is also mounted pivoting on the annular frame 27; it is normally arranged at the front of the first electric connector 16 and the first steam connector 18, and so as to close the entrance to the first part 11.

**[0021]** On the opposite side with respect to the annular frame 27, and at the ends of the rods 26, helical

springs 28 are arranged, able to keep the trolley 25 normally in a position such that it thrusts against the protection tongue 30 and keeps it in a position wherein it closes the entrance to the first part 11.

**[0022]** A torsion spring, not shown in the drawings, is associated with the protection tongue 30, and is able to keep the tongue 30 normally in the position wherein it closes the entrance to the first part 11.

**[0023]** The second part 20 is associated with the external means to generate/feed current and steam, of a conventional type and not shown in the drawings, such as for example the electric network and a boiler of the domestic appliance. The second part 20 comprises a rigid structure 21 having a transverse section substantially mating with that of the rigid structure 13 of the first part 11. Inside, a second electric connector 17, female, and a second steam connector 19, also female, are arranged.

**[0024]** In correspondence with the entrance to the second part 20 there is a contrasting surface 22 able, during use, to contrast the action of the helical springs 28 in order to make the trolley 25 slide.

**[0025]** The attachment element 15 is also associated with the second part 20, and is provided with a manually driven push button 31, a coupling tooth 32 able to be positioned in a mating seating 34 made in the first rigid structure 13, and a spring 33 able to keep the push button 31 and the coupling tooth 32 normally in an outside position with respect to the second rigid structure 20.

**[0026]** The connector 10 as described heretofore functions as follows.

**[0027]** As shown in figs. 2 to 5, when it is necessary to actuate the functioning of the domestic appliance, the first part 11 and the second part 20 are reciprocally brought near each other until (fig. 3) the contrasting surface 22 of the second part 20 comes into contact with the annular frame 27 of the trolley 25.

**[0028]** By bringing the two parts 11 and 20 even closer together (fig. 4), by means of the action exerted by the surface 22, the force of the helical springs 28 is overcome and the trolley 25 is made to slide backwards inside the first rigid structure 13.

**[0029]** This movement of the trolley 25 causes the protection tongue 30 to rotate above the first connections 16 and 18, since the protection tongue 30 is drawn by the trolley 25 and knocks against the front parts of the first electric connector 16 and the first steam connector 18, until it is taken (fig. 5) to a position wherein it does not in the least interfere with the connection between the first connectors 16 and 18 and the corresponding second connectors 17 and 19.

**[0030]** When this condition has been reached, the coupling tooth 32 is inside the corresponding seating 34.

**[0031]** The separation of the two parts 11 and 20 is achieved simply by exerting a slight pressure on the push button 31, so as to dis-associate the tooth 32 from the seating 34, and simultaneously drawing the two parts 11 and 20 in opposite directions. In this way the

helical springs 28 and the torsion spring associated with the tongue 30 return the trolley 25 and the tongue 30 to their initial positions so as to protect the first electric connector 16 and steam connector 18 when they are not connected to the corresponding second connectors 17 and 19.

**[0032]** It is clear, however, that modifications and/or additions of parts may be made to the connector 10 as described heretofore without departing from the field and scope of the present invention.

**[0033]** It is also clear that, although the present invention has been described with reference to specific examples, the person of skill in the art shall certainly be able to embody many other equivalent forms of connector for a domestic appliance such as a vacuum cleaner or electric broom or suchlike, all of which shall come within the field and scope of the present invention.

## Claims

1. Connector for a domestic appliance comprising a first part (11) associated with said domestic appliance and including first electric connection means (16) and possible first steam connection means (18), and a mating second part (20) associated with corresponding current and/or steam generator/feeder members, and comprising second electric connection means (17) and possible second steam connection means (19), said first part (11) being able to be selectively associated with said second part (20) by means of attachment means (15), **characterized in that** it comprises protection means (30) cooperating with said first electric connection means (16) and said first steam connection means (18), said protection means (30) being able to be selectively positioned, at the moment when the two parts (11, 20) are coupled, between a first protection position, wherein they cover said first electric connection means (16) and said first steam connection means (18), and a second connection position, wherein they allow said first electric connection means (16) and said first steam connection means (18) to be associated with said second electric connection means (17) and with said second steam connection means (19).
2. Connector as in claim 1, **characterized in that** said protection means (30) are of the pivoting type and are associated with opening/closing means comprising trolley means (25) mounted able to slide on said first part (11), and contrasting means (22) associated with said second part (20) able to make said trolley means (25) slide longitudinally with respect to said first part (11), so that said protection means (30) are taken to said second connection position.
3. Connector as in claim 2, **characterized in that** elastic means (28) are provided to return said trolley means (25) to their initial position, wherein said protection means (30) are in said first protection position.
4. Connector as in claim 2 or 3, **characterized in that** said trolley means (25) comprise at the sides rod means (26) able to slide in mating guides (14) made in said first part (11), and a frame (27) able to support said protection means (30).
5. Connector as in claim 1, **characterized in that** said first part (11) is substantially tubular in shape and has an annular transverse section.
6. Connector as in claim 1, **characterized in that** said attachment means (15) are associated with said second part (20) and comprise push button means (31), coupling tooth means (32) able to be inserted into a corresponding seating (34) made in said first part (11), and elastic means (33) able to keep said push button means (31) and said coupling tooth means (32) normally in a position outside said second part (20).
7. Connector as in any claim hereinbefore, **characterized in that** said first part (11) is female and is able to partly accommodate said second part (20) inside itself.
8. Connector as in any claim hereinbefore, **characterized in that** said second part (20) is female and is able to partly accommodate said first part (11) inside itself.
9. Connector as in any claim hereinbefore, **characterized in that** said first electric connection means (16) and said first steam connection means (18) are of the male type, and **in that** said second electric connection means (17) and said second steam connection means (19) are of the female type.
10. Connector as in any claim hereinbefore, **characterized in that** said first electric connection means (16) and said first steam connection means (18) are of the female type, and **in that** said second electric connection means (17) and said second steam connection means (19) are of the male type.

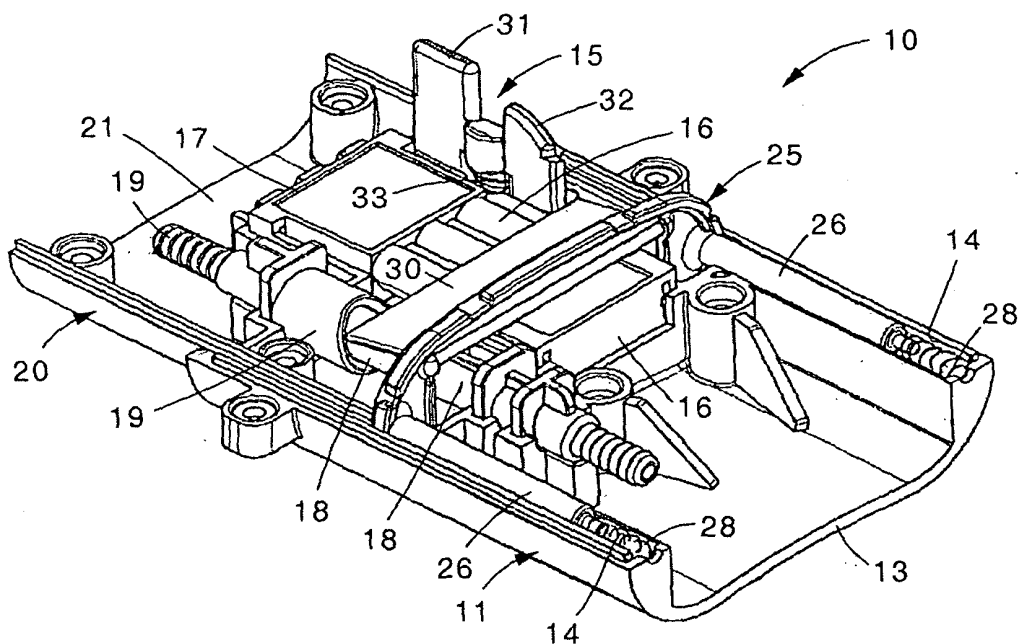


fig. 1

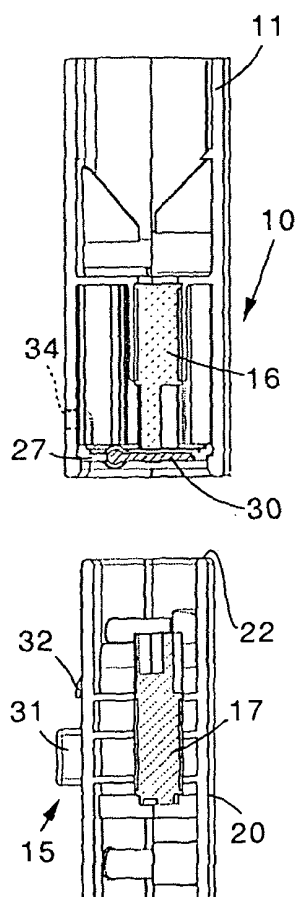


fig. 2

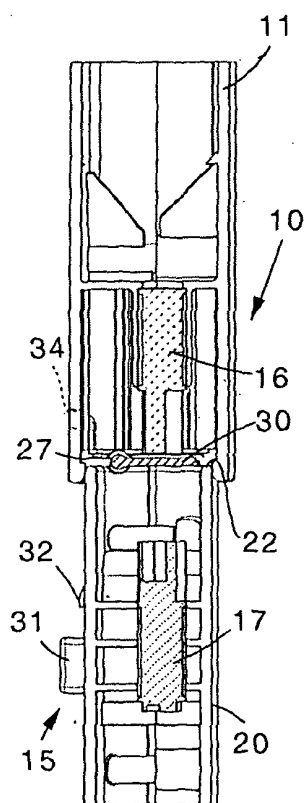


fig. 3

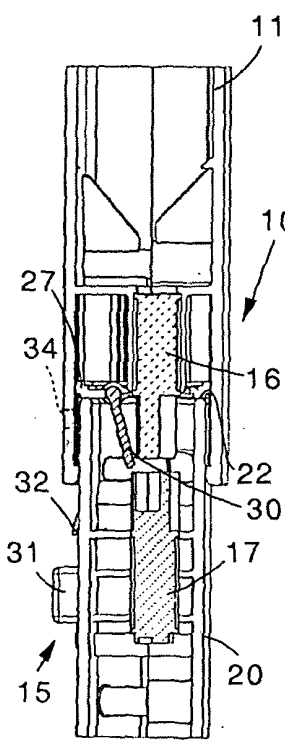


fig. 4

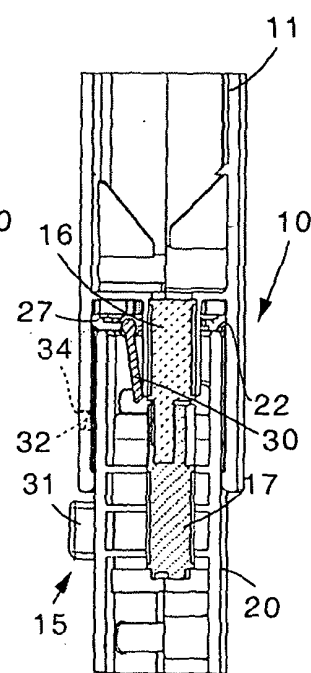


fig. 5



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 03 01 5095

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                             |                                                            |                                                                 |
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| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                             | Date of completion of the search<br><b>20 October 2003</b> | Examiner<br><b>Bourseau, A-M</b>                                |
| <b>CATEGORY OF CITED DOCUMENTS</b><br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                             |                                                            |                                                                 |

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