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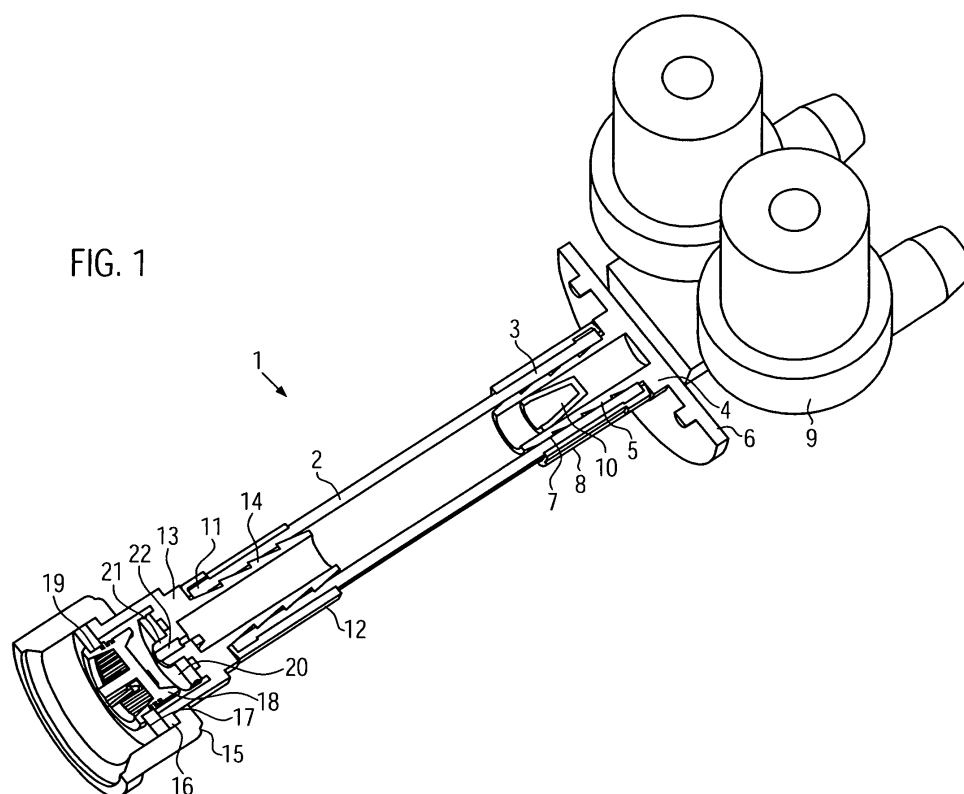
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(54) **Integrated hose-set system**

(57) The invention concerns a hose set and a kit of parts with the hose set. The hose set comprises a hose (2) and at least one first connector (4), suitable to be coupled to a washing machine or a dishwasher with an electrically manipulatable valve (9), wherein the first con-

necter comprises a partially pipe-like shaped single-piece element (5) with an attachment portion (6), with the pipe-like shaped single-piece element partially surrounded by the hose, wherein the attachment portion is configured to be directly brought into contact with the valve, to allow a fluid communication therebetween.



## Description

**[0001]** The invention concerns a hose set, with a hose and at least one first connector suitable to be coupled to a washing machine or a dishwasher with an electric manipulator valve, wherein the first connector comprises a partially pipe liked shape single-piece element with an attachment portion, with the pipe like shaped single-piece element partially surrounded by the hose.

**[0002]** Currently such hose sets are used to connect a dishwasher or a washer machine to a main supply of water and needs a multiplicity of single separate parts.

**[0003]** It is the object of the invention to provide a hose set and a kit of parts with fewer components to simplify assembly operations and make a leakage of water between the parts less probable.

**[0004]** It is further an object to provide a hose set and a kit of parts to simplify the connection of a hose to a valve through which water passes to a washing machine or a dishwasher.

**[0005]** This object is solved by a hose set according to claim 1 in which the attachment portion is configured to be directly brought in contact with the valve to allow a fluid communication therebetween.

**[0006]** Further this object is solved by a kit of parts with an electric valve coupled to such a hose.

**[0007]** By a hose set and a kit of parts according to the invention, it is possible to pre-assemble some components, such as plastic pipes in the valve body or flow regulator supports in the plastic pipes.

**[0008]** It is further possible to eliminate one of the previously needed fixing nuts and gaskets.

**[0009]** The assembly operation is simplified as no further necessity exists to assembly a fixing nut to the hose set or to assemble a gasket in the hose set on its valve side. Further it is avoided to assembly a flow regulator support in the inlet of the valve. No necessity exists to screw the fixing nut on a thread in an inlet of the valve.

**[0010]** Due to less components the costs of production are reduced and due to the minimized assembly operations, the assembly costs are minimized by additionally providing a better workability.

**[0011]** This also results in a better quality of connection between the single separate elements, which leads to less leakage.

**[0012]** Special embodiments are claimed in the dependent claims and are detailed in the following:

It is advantageously to configure the hose such that a first filter is arranged in the first connector, preferably in a pipelike formed portion which is having a serrated outer surface. By the first filter, the water quality of the water entering the valve is enhanced. The serrated outer surface simplifies the creation of a firm connection between the hose and the first connector. Such a configuration simplifies the assembly process of the respective parts.

**[0013]** If the first filter is configured as a hollow cone, wherein the tip of the cone is directed towards the attachment portion and/or the filter is in direct contact with the co-operatingly shaped inside of the first connector, the assembly can be even easier conducted.

**[0014]** To make a leakage proof water connection with a water supply possible, it is preferable that the hose comprises on an opposed end to the first connector, a second connector, which is inserted in the hose and in contact with a fixing nut to be coupled to a water supply.

**[0015]** If the fixing nut is configured as a separate element to the second connector, encompassing a radial shoulder with the second connector, differently configured spigots can be connected to the hose.

**[0016]** To enhance the leakage proofness, a gasket is positioned in sealing engagement with the fixing nut and the second connector.

**[0017]** If the gasket is positioning a second filter, which is extending within the second connector, the water quality is further enhanced and the assembly is simplified.

**[0018]** To avoid overpressure, it is preferable that a flow regulator washer is positioned in a cavity between a second filter and a second connector.

**[0019]** If the flow regulator washer is arranged coaxially to a preferably centrally arranged and circular configured shaft of the second connector, wherein the shaft comprises a stepped hole, the assembly process is simplified such that first the second connector is inserted in the fixing nut followed by the flow regulator washer being inserted in the second connector and being precisely positioned by the shaft, wherein the second filter is finally positioned by use of the gasket, whereby the gasket is pushed on the second connector and squeezed on the inside of the fixing nut when the fixing nut is screwed to a spigot. However, the shaft can be alternatively configured without any hole.

**[0020]** The stepped hole, such as a stepped through-hole itself renders the waterflow through the hose into the valve more stable. The second filter can be positioned very easily, if the second filter has a mainly cylindrical outer surface with cylindrical grooves. Again, it is stressed, that the shaft can be reconfigured without such a hole.

**[0021]** By help of the grooves, tactile feedback for the manufacturing person can be achieved.

**[0022]** The positioning for the first filter in the first connector and the fixing of the hose to the first connector can be provided in one manufacturing step if at least one of the ends of the hose of rubber or plastic material is pressed on the outer surface of the first connector of plastic material by a clamp to avoid loosening. The same applies for at least one of the ends of the hose of rubber or plastic being pressed on the outer surface of the second connector's plastic material via a clamp to avoid loosening, so as to make a undoable connection between a second connector and the hose in a very short manufacturing step possible.

**[0023]** The connection is long lasting and cost-effective.

tive producible, if the clamp is of metallic material.

**[0024]** It is even possible that the manufacturer of the washing machine or the dishwasher with their respective valves integrates the first connector to the electric valve. By such an embodiment the hose set or a kit of parts can be yet easier assembled even if the assembler is unskilled in the assembly process. Such a washing machine or dishwasher then can be quickly connected without problems by an end user to the spigot or water tap.

**[0025]** In the following the invention is specified by help of a drawing.

**[0026]** In the drawing in Figure 1 a hose set with a first connector is disclosed, wherein the first connector has been connected to a valve of a dishwasher or a washing machine.

**[0027]** The figure is only of schematical nature in which the disclosed elements are shown in a partial sectional perspective view.

**[0028]** Figure 1 discloses a hose set 1 according to the invention. The hose set 1 comprises a hose 2 of rubber or plastic material. This hose 2 surrounds at a first end 3 a first connector 4. The first connector 4 comprises a partially pipelike shaped single-piece element with an attachment portion 6. On the outside of the single piece element 5 in the section being pipelike formed, a serrated structure 7 with grooves is configured.

**[0029]** The serrated structure 7 can also be denominated as a serrated surface.

**[0030]** The hose 2 is surrounded at its first end 3 by a metallic clamp 8. The clamp 8 executes radially pressure on the compressible material of the hose 2, so that a form- and/or force-fit between the hose 2 and the single-piece element 5 is achieved.

**[0031]** The first connector 4 is fixed to an electrically manipulatable valve 9. The valve 9 can alternatively be mechanically or electromechanically manipulatable. The valve 9 is configured in the current embodiment as a so called "double" valve but can also be configured as a "single" valve or a "triple" valve. The attachment portion 6 is e.g. welded to the valve 9. Other connection types such as gluing or press-fitting are also possible.

**[0032]** Another solution is **characterized in that** the attachment portion 6 and the valve are made of one piece, so that there is no need for assembly at all.

**[0033]** In the pipelike formed section of the single-piece element 5, a first filter 10 is positioned. The first filter 10 is having a constant valve thickness. The first filter 10 has an outer conical configuration with an hollow inner chamber. The chamber is closed in direction to the valve 9. Further, the first filter 10 is positioned such that the smaller diameter is directed to the valve 9 and the radial diameter is directed to a water tap, which is positioned on the other side of the hose 2.

**[0034]** The first filter 10 can also be absent and if present, can be positioned in both directions.

**[0035]** This water tap or spigot is not shown in Figure 1.

**[0036]** In the embodiment of Figure 1 the first filter 10 is positioned in the first connector 4 due to a distortion

of the first connector 4 and the hose 2 by the clamp 8. Preferably the metal clamp 8 is made of aluminum, copper or steel. On a second end 11 on the hose 2 opposite to the first end 3, another similar metallic clamp 12 fixes the hose 2 to the second connector 13. The second connector 13 also comprises a pipelike section 14 with a serrated outer surface.

**[0037]** In contrast to the first connector 4 the second connector 13 is in contact with a fixing nut 15. The fixing nut 15 engages a shoulder 16 of the second connector 13.

**[0038]** A gasket 17, in contact with the inner surface of the fixing nut 15 and the actual outer surface of the second connector 13, is in contact with a second filter 18 and positioning the second filter 18 relative to the second connector 14 as soon as the hose set 1 is fixed to the water tap or spigot. The gasket 17 is positioned in a groove 19 of the second filter 18.

**[0039]** Between the second filter 18 and the second connector 13 a centrally arranged flow regulator washer 20 is positioned. This flow regulator washer 20 is surrounding a shaft 21 of the second connector 13.

**[0040]** The shaft 21 is having a stepped through hole 22.

**[0041]** The assembly process is simplified essentially in that the first connector 4 can be either previously fixed to the electric valve 9 or part of the valve body of the electric valve 9 and that the hose 2 can be fixed to the second connector 13 via the metallic clamp 12. Further the second connector 13 could be completed with the flow regulator 20 and the second filter 18 held in position by the gasket 17, whereby this combination is surrounded by a fixing nut 15.

**[0042]** The second end of the hose 2 has only to be pushed over the serrated structure 7 of the first connector 4 after the first filter 10 has been pushed into the last single piece element 5, whereas the metallic clamp 8 fixes all three elements in their respective position relative to each other. Finally only the fixing nut 15 has to be screwed on the spigot or the water tap.

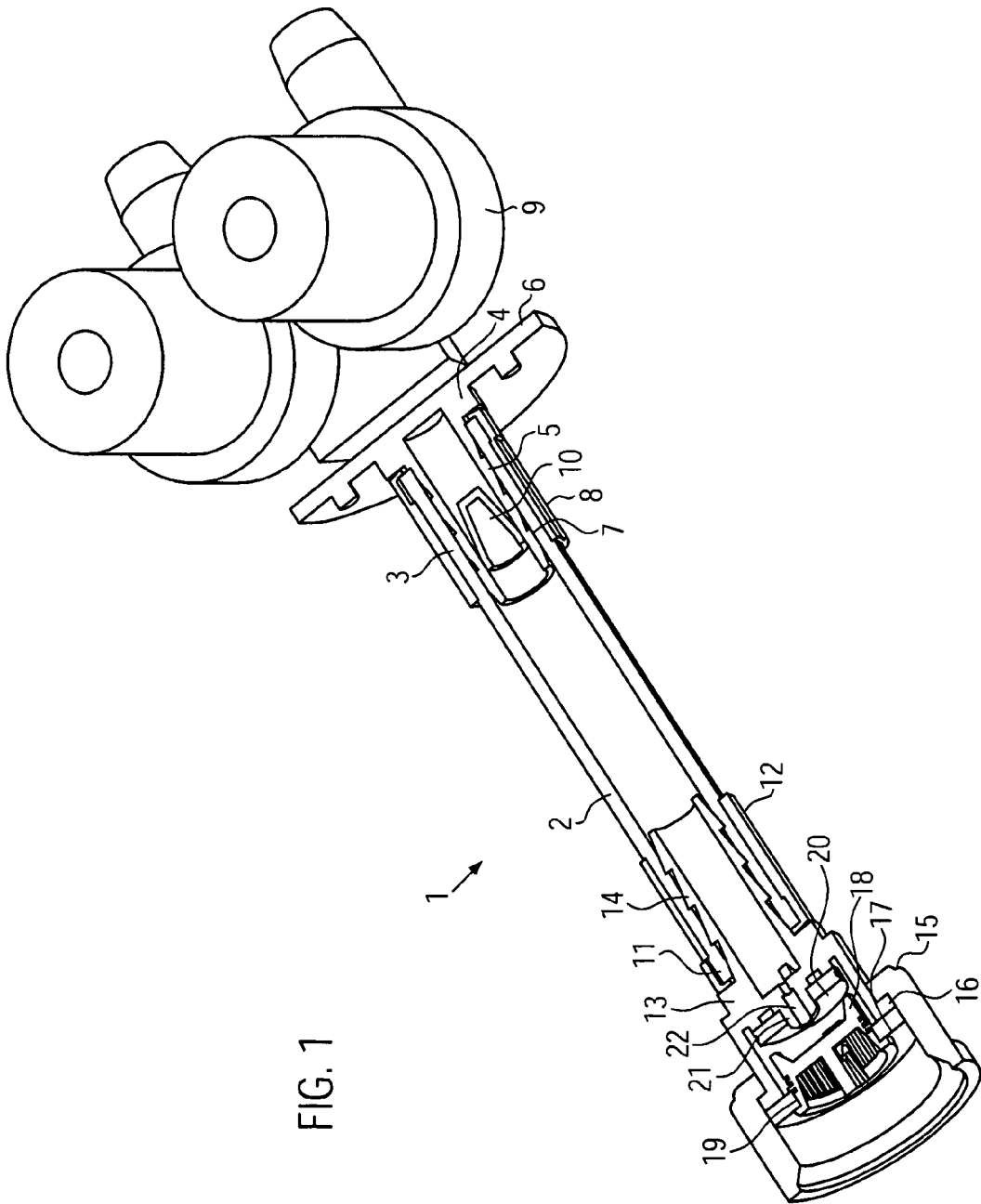
**[0043]** The assembly process of the hose set to the washing machine or dishwasher in question is already completed, except that the nut has to be screwed on the main water supply in the respective household.

## Claims

1. Hose set (1) with a hose (2) and at least one first connector (4), suitable to be coupled to a washing machine or a dishwasher with an electrically manipulatable valve (9), wherein the first connector comprises a partially pipelike shaped single-piece element (5) with an attachment portion (6), with the pipelike shaped single-piece element (5) partially surrounded by the hose (2), **characterized in that** the attachment portion (6) is

configured to be directly brought in contact with the valve (9), to allow a fluid communication therebetween.

2. Hose set (1) according to claim 1, **characterized in that** the attachment portion (6) is an integrated part of the valve body of the valve (9), to allow a fluid communication therethrough. 5
3. Hose set (1) according to claim 1 or 2, **characterized in that** a first filter (10) is arranged in the first connector (4), preferably in the pipelike formed portion which is having a serrated outer surface (7). 10
4. Hose set (1) according to claim 3, **characterized in that** a first filter (10) is configured as a hollow cone, wherein the tip of the cone is directed to the attachment portion (6) and/or the first filter (10) is in direct contact with the cooperatively shaped inside of the first connector (4). 15 20
5. Hose set (1) according to one of the claims 1-4, **characterized in that** the hose (2) comprises on an opposed end (11) to the first connector (4) a second connector (13), which is inserted in the hose (2) and in contact with a fixing nut (15) to be couple to a water supply. 25
6. Hose set (1) according to claim 5, **characterized in that** the fixing nut (15) is configured as a separate element to second connector (13), encompassing a radial shoulder (16) of the second connector (13). 30
7. Hose set (1) according to claim 5 or 6, **characterized in that** a gasket (17) is positioned in sealing engagement with the fixing nut (15) and the second connector (13). 35
8. Hose set (1) according to claim 7 **characterized in that** the gasket (17) is positioning a second filter (18) which is extending within the second connector (13). 40
9. Hose set (1) according to claim 8, **characterized in that** a flow regulator washer (20) is positioned in a cavity between the second filter (18) and the second connector (13). 45
10. Hose set (1) according to claim 9, **characterized in that** the flow regulator washer (20) is arranged coaxially to a preferably centrally arranged and circular configured shaft of the second connector (21), wherein the shaft (21) comprises a stepped hole (22). 50
11. Hose set (1) according to claim one of the claims 8-10, **characterized in that** the second filter (18) has a mainly cylindrical outer surface with circumferential grooves (19). 55
12. Hose set (1) according to one of the claims 1-11, **characterized in that** at least one of the ends of the hose (2) of rubber or plastic material is pressed on the outer surface of the first connector (4) or the second connector (13) of plastic material by a clamp (8 or 12) to avoid loosening.
13. Hose set (1) according to claim 12, **characterized in that** the clamp (8 or 12) is of metallic material.
14. According to claim 13 **characterized in that** the first filter (10) is fixed in its position due to pressure applied by the metal clamp (8).
15. Kit of parts with an electric valve (9) coupled to a hose set (1) according to one of the claims 1-14, wherein the first connector (4) is preferably integrated to the electric valve (9).





## EUROPEAN SEARCH REPORT

Application Number  
EP 09 01 0184

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                   |                                                 |                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document with indication, where appropriate, of relevant passages                                                                                                     | Relevant to claim                               | CLASSIFICATION OF THE APPLICATION (IPC)     |
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| -----<br>-/--                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                   |                                                 |                                             |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                   |                                                 |                                             |
| Place of search<br>Berlin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                   | Date of completion of the search<br>9 June 2010 | Examiner<br>Wilson, Mark                    |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                                                   |                                                 |                                             |

6

EPO FORM 1503 03/82 (P04/C01)



## EUROPEAN SEARCH REPORT

Application Number  
EP 09 01 0184

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                           |                                                 |                                         |
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| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Citation of document with indication, where appropriate, of relevant passages                             | Relevant to claim                               | CLASSIFICATION OF THE APPLICATION (IPC) |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                           |                                                 |                                         |
| Place of search<br>Berlin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                           | Date of completion of the search<br>9 June 2010 | Examiner<br>Wilson, Mark                |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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/>.....<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                           |                                                 |                                         |

6

EPO FORM 1503 03/02 (P04C01)



Application Number

EP 09 01 0184

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number

EP 09 01 0184

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 12-15(completely); 4(partially)

The positioning and fixing of the filter in the first connector

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2. claim: 4(partially)

The conical shape of the filter in the first connector

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3. claims: 5-11

The second connector being inserted into the hose and having a fixing nut.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 01 0184

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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09-06-2010

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82