US 20030140450A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2003/0140450 A1**

Pineschi (43) **Pub. Date: Jul. 31, 2003**

(54) **MULTIFUNCTIONAL TERMINAL FOR EXTERNAL SUCTION TUBES OF VACUUM-OPERATED ELECTRICAL DOMESTIC APPLIANCES**

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(21) Appl. No.: **10/347,361**

(22) Filed: **Jan. 21, 2003**

(30) **Foreign Application Priority Data**

Jan. 25, 2002 (IT) M02002A000018

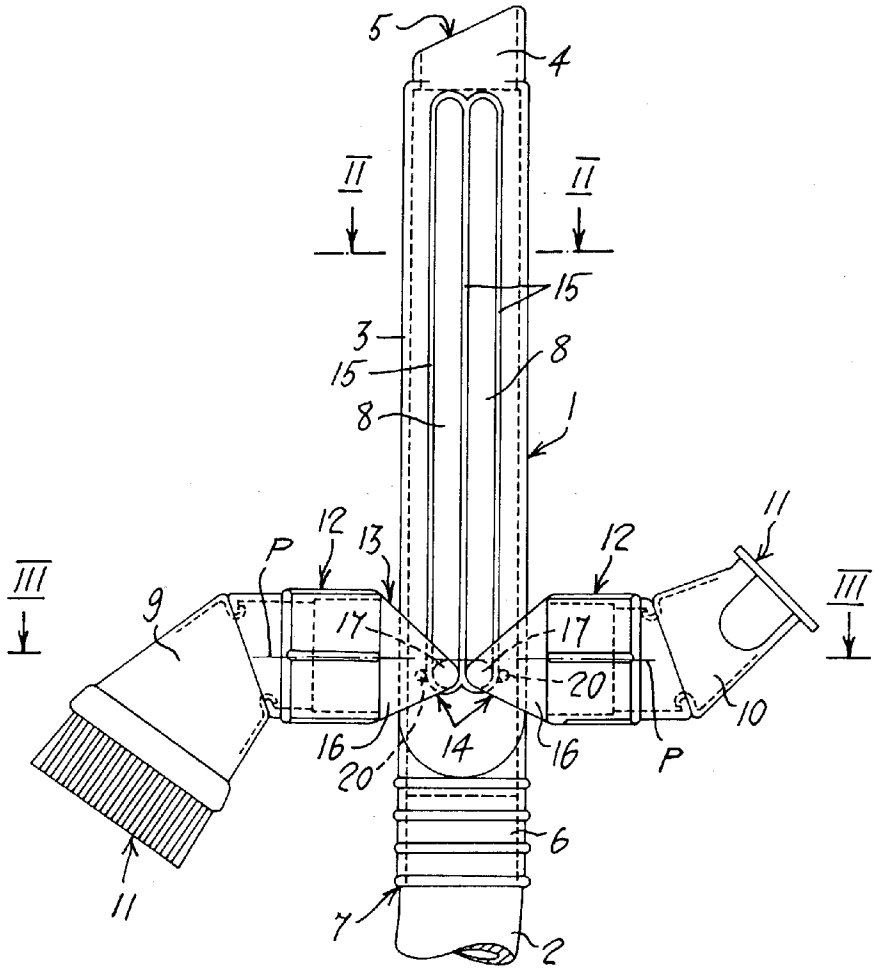
Publication Classification

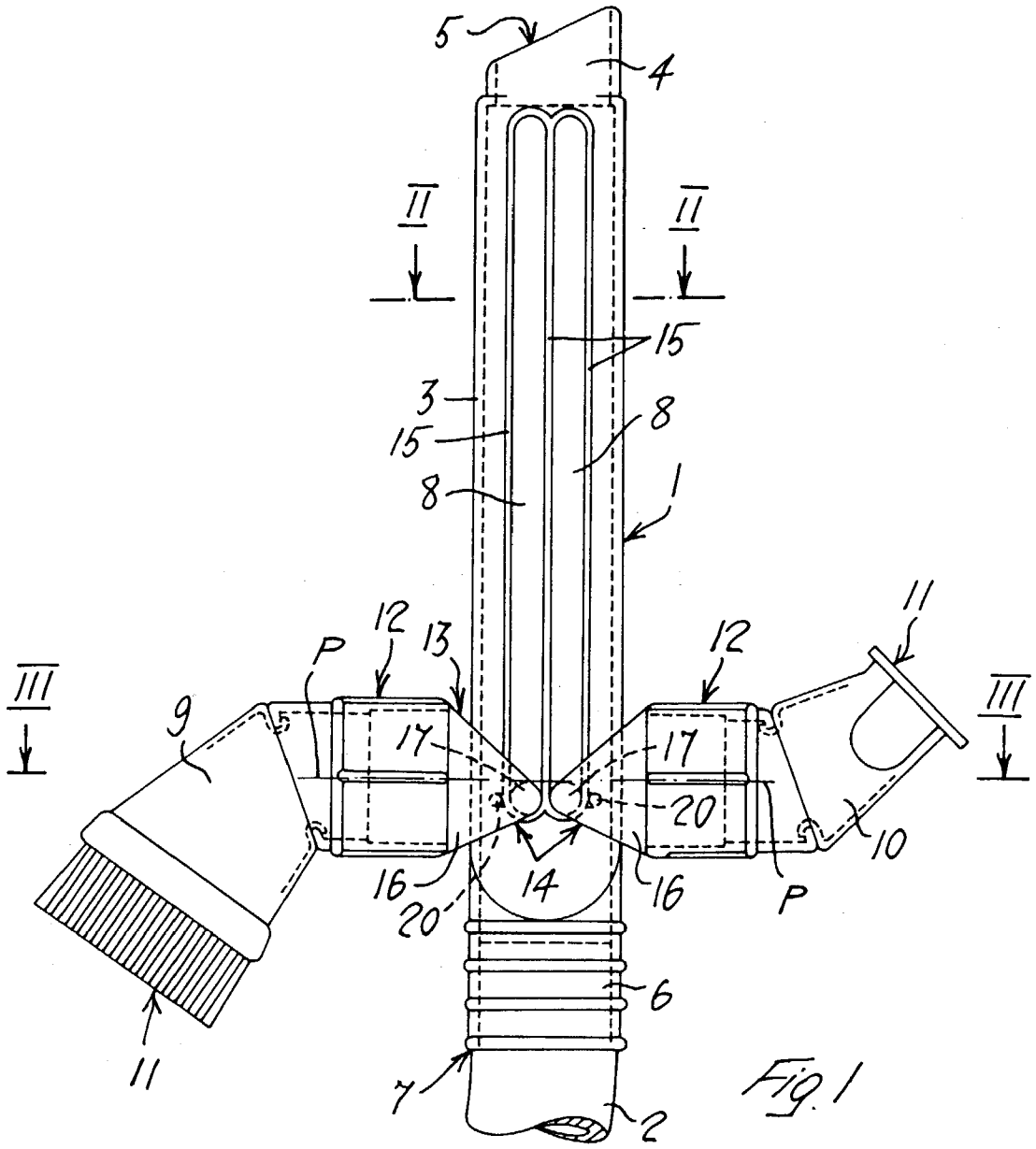
(51) **Int. Cl.**[7] **A47L 9/02**

(52) **U.S. Cl.** **15/416**

(57) **ABSTRACT**

The multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances comprises a tubular body forming a spear-shaped mouth at a distal end and a cylindrical mouth at the opposite, proximal end capable of being coupled by pressure-fitting to the head of the said external suction tube, at least one pair of parallel guides formed in diametrically opposite positions on the external surface of the said tubular body, at least one cleaning accessory comprising an active end and, opposite to the latter, a tubular base provided with means for twist-and-slide coupling to the said parallel guide for longitudinal sliding therein between the said proximal end and distal end, and vice versa, of the said tubular body and the rotation of the said accessory at the distal end for the coaxial fitting of the said base on the said distal end of the said tubular body, and means for retaining the said cleaning accessory in the substantially proximal position of non-use of the said guides.

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II
II
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12
13
P
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11
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2

Fig. 1

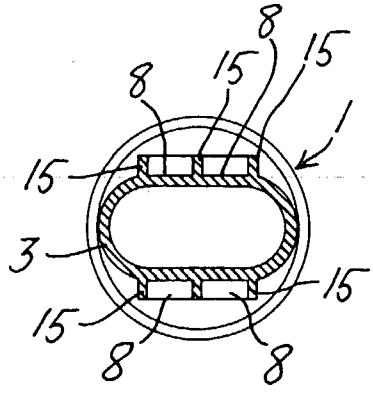
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Fig. 2

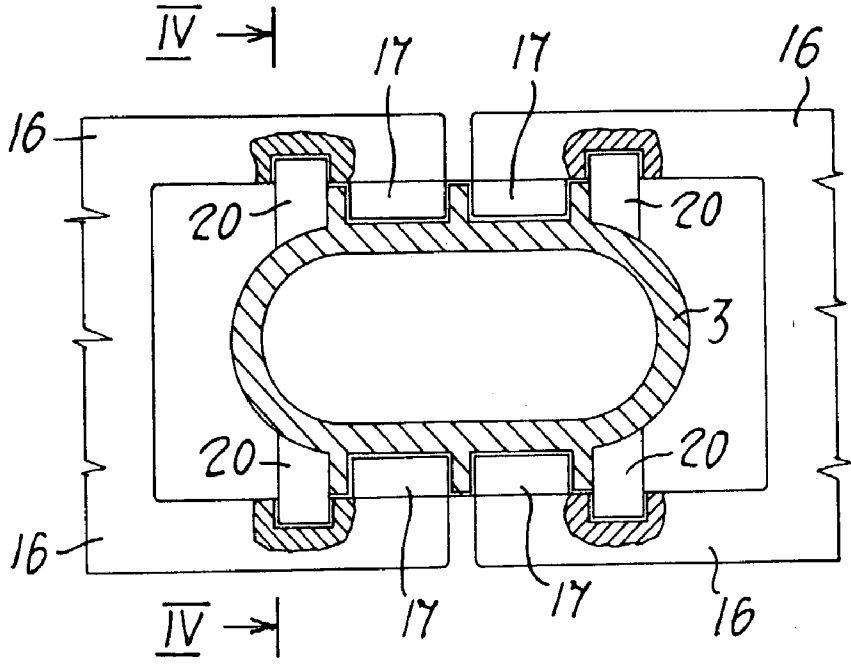
IV
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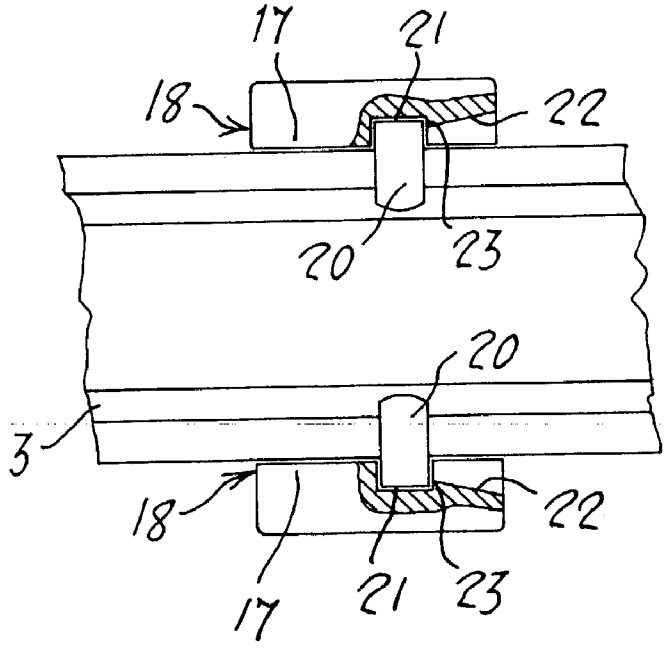
Fig. 3


17
21
18
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23
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3
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23

Fig. 4

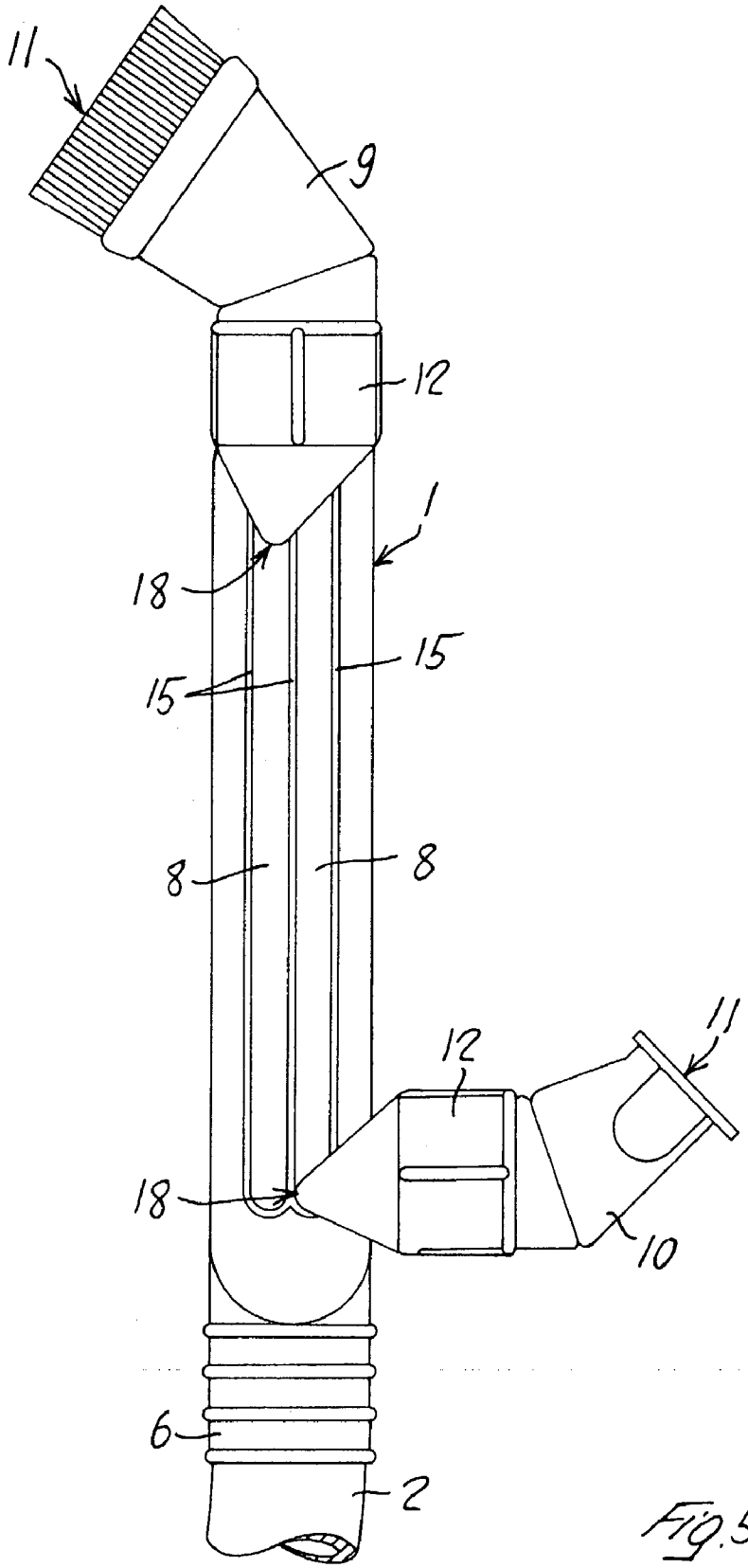

Fig. 5

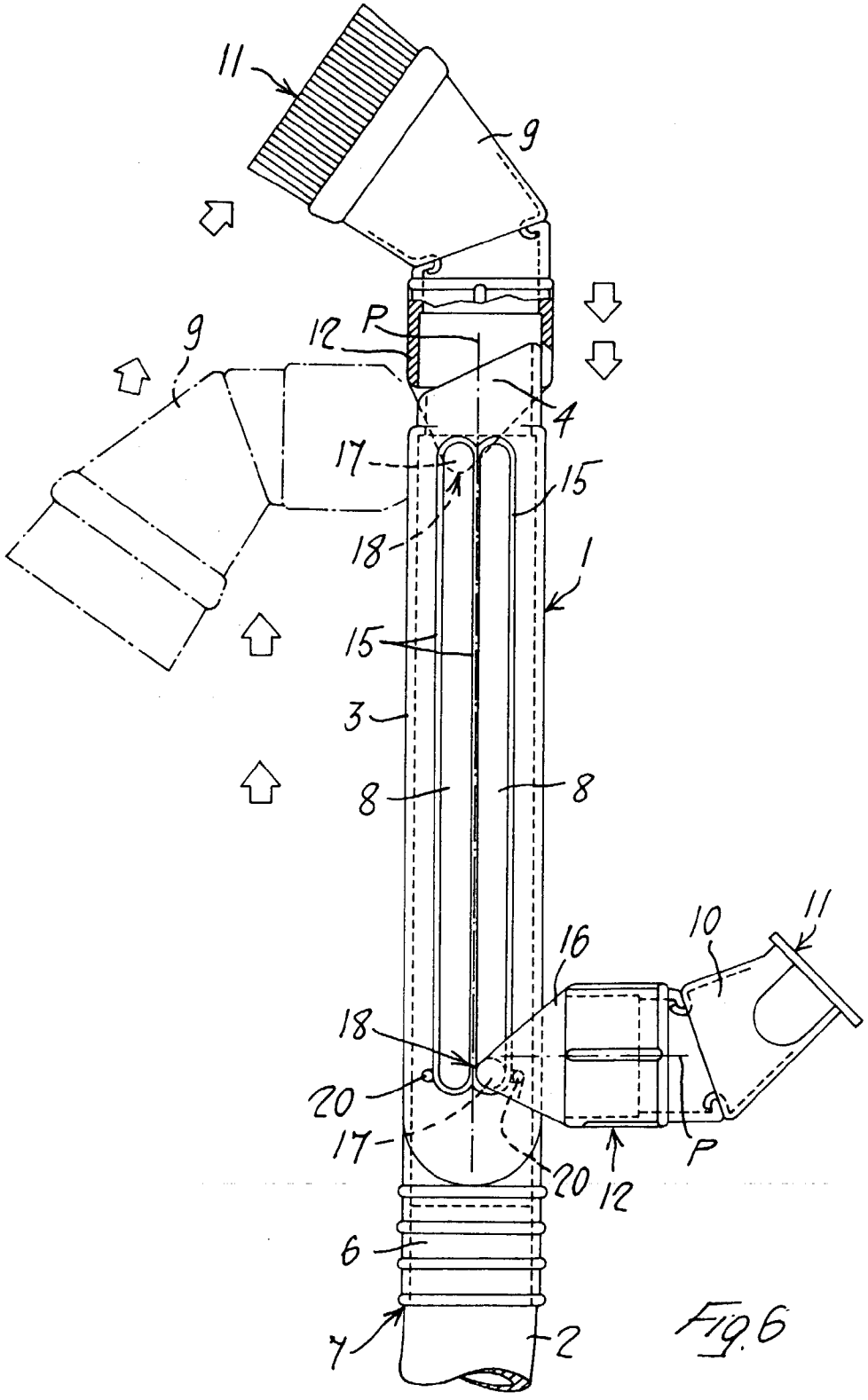

Fig. 6

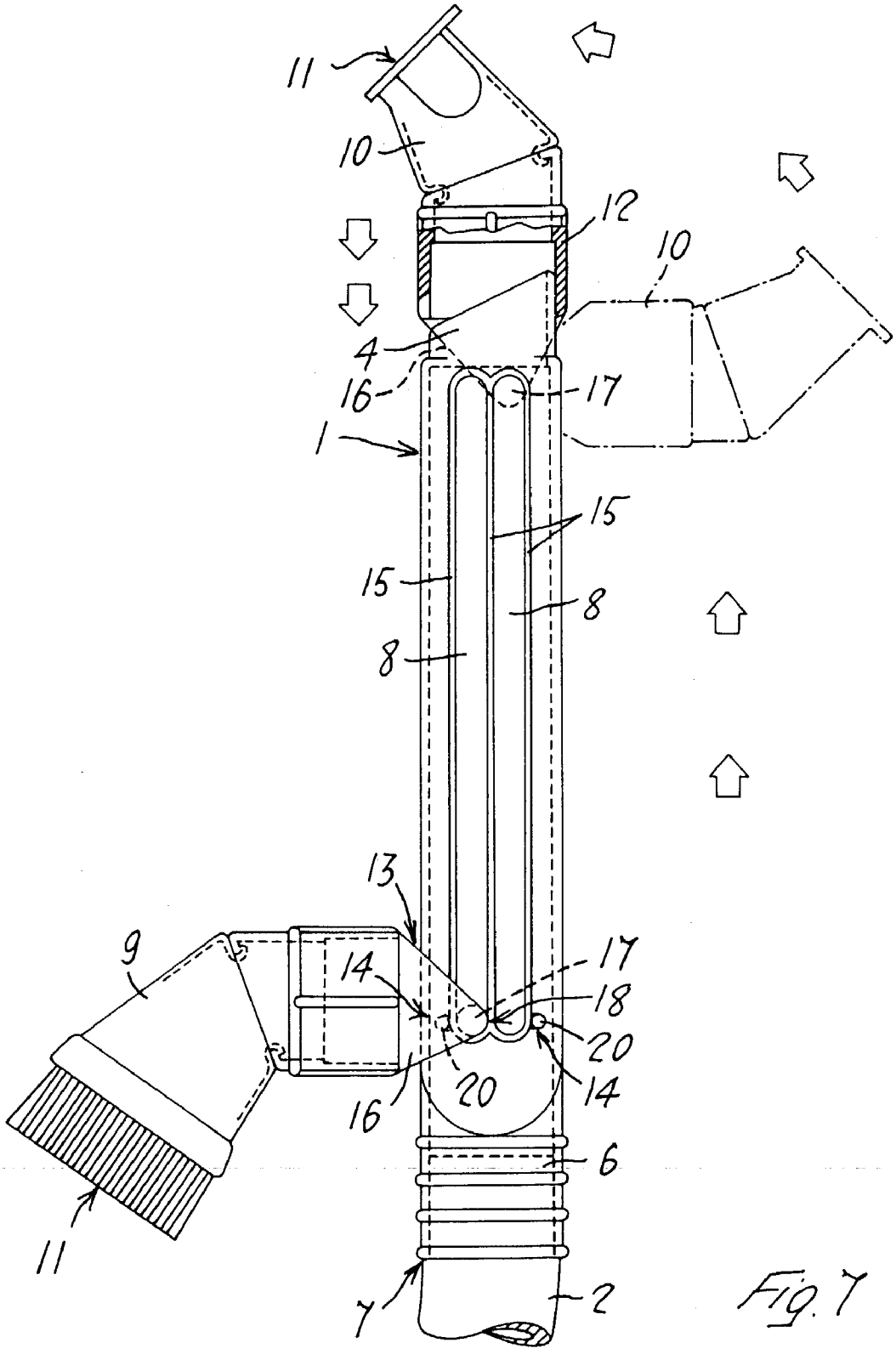

Fig. 7

MULTIFUNCTIONAL TERMINAL FOR EXTERNAL SUCTION TUBES OF VACUUM-OPERATED ELECTRICAL DOMESTIC APPLIANCES

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances.

[0002] It is known that the electrical domestic appliances used for cleaning are provided with tubes which connect the suction body to a number of accessories that have been appropriately designed and produced for various uses.

[0003] These accessories essentially comprise at least one nozzle having a narrow opening and a brush provided with a hollow central body and with a mouthpiece to be used on fabrics and "quilted" materials.

[0004] Other, even more specialized accessories may of course be provided, but the basic equipment is substantially as described above.

[0005] These accessories are used alternatively, being pressure-fitted from time to time on the free end of the external suction tube; when they are not in use, they are normally put away by the user in an appropriate compartment provided in the suction body of the electrical domestic appliance or, in the absence of such a compartment, are kept within the box constituting the packaging of the electrical domestic appliance; in other cases, they are placed on shelves or the like normally used for storage.

[0006] In all cases described above, the accessories are inconvenient to use because the user must, on each occasion, find the accessory to be used, remove the one previously used and put it away and fit the one now selected.

[0007] In the event that the accessories are put away in a place dedicated to the purpose, finding the accessory or accessories to be used is a very easy task, but, in the event that the accessories are put away in temporary and unexpected places, time is wasted on finding them and this added to the time required for the various removal and assembly manoeuvres.

[0008] Even in the event that the accessories are put away in places intended for that purpose, they are not in any event immediately available and the user has to discontinue the operation of the electrical domestic appliance on each occasion until he has been able to replace the accessory.

SUMMARY OF THE INVENTION

[0009] It is an object of the present invention to eliminate the disadvantages of the prior art complained of above by selecting a multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances which permits users to have immediate manual access to the basic accessories normally provided with the abovementioned vacuum-operated electrical domestic appliances.

[0010] These objects are all achieved by the present multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances, in which it comprises a tubular body forming a nozzle-type mouth at a distal end and a cylindrical mouth at the opposite, proximal end capable of being coupled by pressure-fitting to the head of the said external suction tube, at least one pair of parallel guides formed in diametrically opposite positions on the external surface of the said tubular body, at least one cleaning accessory comprising an active end and, opposite to the latter, a tubular base provided with means for twist-and-slide coupling to the said parallel guides for longitudinal sliding therein between the said proximal end and distal end, and vice versa, of the said tubular body and the rotation of the said accessory at the distal end of the said guides for the coaxial fitting of the said base on the said distal end of the said tubular body, and means for retaining the said cleaning accessory in the substantially proximal position of non-use of the said guides.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Further features and advantages of the present invention will be more apparent from the detailed description of a preferred, though not exclusive, form of embodiment of a multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances illustrated by way of indication, but without implying any limitation, in the attached pages of drawings, in which:

[0012] **FIG. 1** is an overall lateral view of the multifunctional terminal according to the invention, provided with two accessories shown in the position of non-use;

[0013] **FIG. 2** is a cross section through the multifunctional terminal in the plane marked II-II in **FIG. 1**;

[0014] **FIG. 3** is a cross section of the multifunctional terminal in a plane marked III-III in **FIG. 1**;

[0015] **FIG. 4** is a detail of a longitudinal section of the multifunctional terminal in a plane marked IV-IV in **FIG. 3**;

[0016] **FIG. 5** shows the multifunctional terminal with a first brush-type accessory fitted in the position of use;

[0017] **FIG. 6** shows the multifunctional terminal in partial section at the distal end, the movement for fitting the brush-type accessory according to **FIG. 5** being shown in broken lines; and

[0018] **FIG. 7** again shows the multifunctional terminal in partial section at the distal end, on which is fitted a second mouthpiece-type cleaning accessory for quilted materials and fabrics together with, in broken lines, the movement for the fitting thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0019] With particular reference to the said figures, **1** globally designates a multifunctional terminal for external suction tubes **2** with which vacuum-operated electrical domestic appliances are normally equipped, such as vacuum cleaners and electrical brooms, these not being illustrated because they are known.

[0020] The terminal **1** essentially comprises a tubular body **3** which is preferably rectilinear and forms a nozzle-type mouth **4** at one, distal end **5** and a cylindrical mouth **6** at the opposite, proximal end **7**, susceptible of allowing the coupling by pressure-fitting of the abovementioned distal end **5** to the head of the external suction tube **2**.

[0021] Along the flanks of the tubular body **3**, whilst specifically on the external surface thereof, are made two pairs of guides **8** which are parallel and diametrically opposite one another.

[0022] The terminal **1**, in the preferred form of embodiment, is provided with two cleaning accessories, a brush-type accessory **9** and a mouthpiece-type accessory **10** that can be used on "quilted" materials and fabrics.

[0023] Each of the accessories **9** and **10** comprises an active end **11** and, opposite thereto, a base **12** which is likewise tubular and provided with means **13** for twist-and-slide coupling to the two pairs of parallel guides **8**; the means **13** permit the longitudinal sliding of the accessories **9** and **10** along the abovementioned pairs of parallel guides **8** between the said proximal end **7** and distal end **5** and vice versa.

[0024] When one of the accessories **9** and **10** reaches the distal end **5** of the pairs of guides **8**, it can rotate in order to be fitted by its base **12** onto the nozzle-type distal end **5** of the tubular body **3**.

[0025] Provided at the distal end **7** of the latter are means **14** for securing both, or alternatively one, of the cleaning accessories **9** and **10** when these are not in use by the user.

[0026] The two pairs of guides **8** are formed by respective parallel ribs **15** projecting outwards from the perimetral surface of the body **3**, diametrically opposite to one another and joined at their ends by a curved closure section: the said perimetral surface forms, together with the said guides **8**, blind holes.

[0027] The twist-and-side coupling means **13** of the bases **12** of the cleaning accessories **9** and **10** comprise, for each accessory, a pair of parallel brackets **16** which project from the bases **12**, with no substantial break in continuity, and are susceptible of encompassing the diametrically opposed guides **8**.

[0028] From the internal surfaces of the brackets **16** there project, orthogonally thereto, two respective cylindrical buttons **17** coaxially facing one another and capable of engagement in the guides **8** or blind holes.

[0029] The brackets **16** exhibit, in plan view, substantially the shape of a scaling triangle with uniform vertices **18** coinciding with the respective ends opposite to the base **12**; the said vertices **18** and the cylindrical buttons are disposed eccentrically relative to a theoretical perpendicular plan of symmetry of the base **12**, designated "P".

[0030] The retention means **14** for retaining each accessory **9** and **10** in the proximal position when they are not in use comprise two pairs of pawls **20** projecting from, solidly fixed to and diametrically opposite to the external surface of the tubular body **3**, in the position of the proximal ends of the guides **8**.

[0031] The above mentioned means **14** further comprise, correspondingly, hollow seatings **21** for accommodating the pawls **30**, which are made in both the brackets **16** of each accessory **9** and **10** and form entries provided with a flare portion **22** having the function of guiding the fitting and forming, at the point of junction with the hollow seatings **21**, retention teeth **23** over which the abovementioned pawls **20** can hook by resilient latching.

[0032] In the preferred form of embodiment of the multifunctional terminal **1**, the cross section of the tubular body **3** is, with the exception of the section which defines the said proximal end **7** for pressure-fitting to the head of the external suction tube **2**, of helixoidal form with at least two rectilinear and mutually parallel sections opposite and perpendicular to the minor diameter, on which the parallel guides **8** are made.

[0033] The functioning of the multifunction cap **1** is as follows: it is fitted in a conventional manner, specifically by pressure-fitting on the end of an external tube **2** provided for an electrical domestic appliance, for example a vacuum cleaner, which is connected to the suction body thereof.

[0034] When the user has to employ the nozzle-type mouth **4** alone, he withdraws the cleaning accessories **9** and **10** towards the proximal end of the guides **8**, causing the buttons **17** with which they are provided at the ends of the brackets **16** to slide in the said guides until the hollow seatings **21** made therein engage by latching onto the pawls **20**, hooking over the retention teeth **23** with which the abovementioned hollow seatings **21** are provided.

[0035] In this configuration, the cleaning accessories **9** and **10**, although remaining at a distance from the active zone of the nozzle-type mouth **4**, are nevertheless within reach when it is necessary to make use thereof.

[0036] In this case, the user extracts, by exerting light pressure on the accessory to be used, the seatings **21** from the pawls **30**, causing the said accessory to slide along the longitudinal guides **8** until the buttons **17** come into abutment against the end closure sections of the ribs **15** which constitute the said guides **8**; in that position, the buttons **17** act as a fulcrum for the rotation of the preselected accessory, until the mouth of the tubular base **12** thereof is coaxially aligned with the said nozzle-type mouth **4**.

[0037] Once the above mentioned alignment has been completed, the accessory is again caused to move back along the guides **8** for a short distance until the tubular base **12** engages on the distal end of the multifunction cap **1**.

[0038] The eccentricity of the buttons **17** relative to the normal plane of symmetry "P" of the base **12** permits the free rotation of the accessory, before its final fitting, there being no interference between the corners of the nozzle-type mouth **4** and the perimetral edges of the base **12**.

[0039] The accessory fitted on the distal end **5** is removed by following the opposite procedure: in practice, by pulling the accessory gently outwards, in other words causing the buttons **17** to slide until they again come into abutment against the closure sections of the ribs **15**, the tubular base **12** is first disengaged from the nozzle-type mouth **4**; the accessory is then rotated outwards and is withdrawn along the guides **8** until the hollowing seatings **21** of the brackets **16** once again engage onto respective pins **20**, locking the accessory previously used in that retracted position.

[0040] By acting upon the other in the same manner as described, it is rapidly replaced in the fitted position of use.

[0041] It has been found in practice that the invention described achieves the proposed objects, in other words makes it possible to replace the accessories rapidly on the terminal **1** and have them constantly within reach.

[0042] The invention is capable of numerous modifications and variations, all of which fall within the scope of protection as defined by the wording of the claims that follow.

[0043] Moreover, any detail may be replaced by another technically equivalent detail.

[0044] In practice, the materials used, and the shapes and dimensions, may be of any type dictated by requirements, without thereby departing from the scope of protection of the present invention.

I claim:

1. Multifunctional terminal for external suction tubes of vacuum-operated electrical domestic appliances, comprising a tubular body forming a spear-shaped mouth at a distal end and a cylindrical mouth at the opposite, proximal end capable of being coupled by pressure-fitting to the head of the said external suction tube, at least one pair of parallel guides formed in diametrically opposite positions on the external surface of the said tubular body, at least one cleaning accessory comprising an active end and, opposite to the latter, a tubular base provided with means for twist-and-slide coupling to the said parallel guides for longitudinal sliding therein between the said proximal end and distal end, and vice versa, of the said tubular body and the rotation of the said accessory at the distal end of the said guides for the coaxial fitting of the said base on the said distal end of the said tubular body, and means for retaining the said cleaning accessory in the substantially proximal position of non-use of the said guides.

2. Multifunctional terminal according to claim 1, in which the said guides are formed by respective parallel projecting ribs diametrically opposite to the external surface of the said tubular body, joined at the ends by respective curved closure sections and forming, together with the said outer surface, blind holes.

3. Multifunctional terminal according to claim 1, in which the said means for the twist-and-slide coupling of the said base of the said cleaning accessory comprise a pair of parallel and mutually spaced brackets projecting from the said base and susceptible of encompassing the said diametrically opposed guides, a pair of respective cylindrical buttons projecting transversely and orthogonally from the said brackets and facing one another coaxially for clamping engagement in the said guides.

4. Multifunctional terminal according to claim 3, in which the said brackets exhibit, in plan view, substantially the shape of a scalene triangle with uniform vertices coinciding with the respective ends opposite to the said base and from within which the said cylindrical buttons project.

5. Multifunctional terminal according to claim 4, in which the said vertices and cylindrical buttons are disposed eccentrically relative to a theoretical perpendicular plan of symmetry of the said base of the said cleaning accessory.

6. Multifunctional terminal according to claim 1, in which the said retention means for retaining the said accessory in the proximal position of non-use comprise at least one pawl solidly fixed to and projecting from the external surface of the said tubular body in proximity of the said proximal end, a hollow seating for accommodating the said pawl made in at least one of the said brackets and forming an entry provided with a flared guide and a spring-latched hook-over retaining tooth.

7. Multifunctional terminal according to claim 1, in which the said pairs of guides are two in number and the said cleaning accessories are two in number, each being mounted to slide along a respective pair of the said guides.

8. Multifunctional terminal according to claim 7, in which the said cleaning accessories have, in the position of use where they are fitted onto the said distal end of the said tubular body, their respective active ends uniformly folded back relative to the respective tubular bases at an obtuse angle relative to the longitudinal axis of the said tubular body.

9. Multifunctional terminal according to claim 1, in which the cross section of the said tubular body is, apart from the said proximal end for pressure-fitting engagement with the head of the said external suction tube, of ellipsoidal form having at least two sections diametrically opposite and perpendicular to the minor diameter which are rectilinear and mutually parallel and on which the said parallel guides are made.

* * * * *