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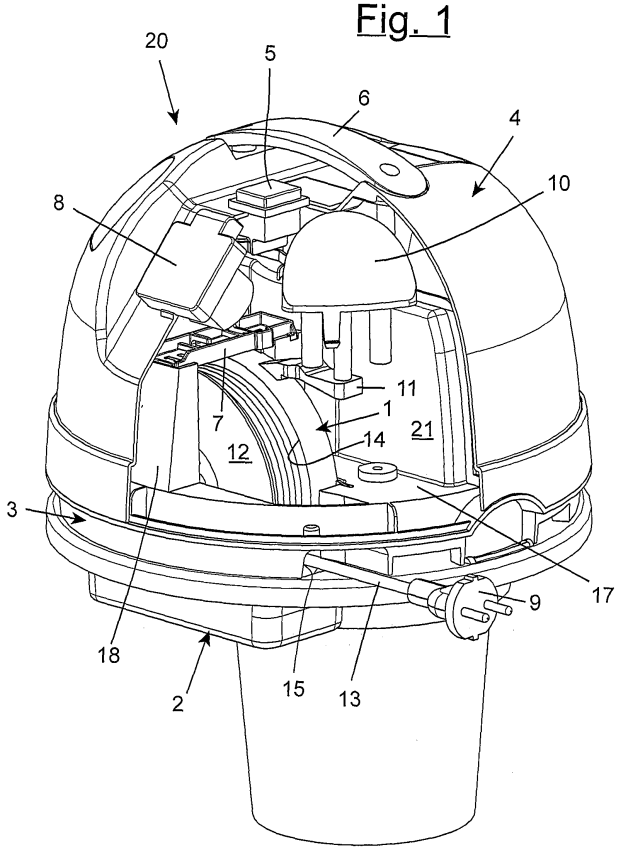
(54) Suction device with improved structure

(57) Suction device with improved structure, comprising a head (20), which includes a lower cover (2) for accommodating a filter of the suction device, an intermediate shaped cover (3) and an upper cover (4), accommodated inside which there is a cable-winding device (1), made up of a drum (12) with plates, which determines a housing (14), for positioning the power supply cable (13) of the suction device, during the automatic winding of the same; the cable-winding device (1) is mounted vertically inside the upper cover (4) of the head (20) and it is accommodated inside a shaped seat (16), made on a base (19) of the intermediate cover (3), in such a manner to accommodate the dimension of the structure.

Fig. 1



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Description

[0001] The present invention, in general, refers to a suction device with improved structure.

[0002] More in particular, the invention regards a device for winding and holding the power supply cable of a suction device, intended for suctioning both solids and liquids. The traditional type of suction devices, such as solid and/or liquid material suction devices, pond-cleaning and/or pool-cleaning devices for professional use, and also household electric sweepers, usually have one or more hooks or shaped support structures, usually made on the external shell of the suction device and or electric sweeper, for housing the electrical power supply cable, when the abovementioned suction device is not being used.

[0003] However such solutions have various drawbacks, one above all being that one is obliged to hook the cable manually each time the suction device is stored away, alongside the need to unwind the entire cable, which thus turns into an obstacle under normal conditions of use, during the operation of the suction device.

[0004] Using hooks or other support elements fixed on the external structure of the suction device, alongside the heap of the coiled cable, occupy a lot of space, which advisably requires to be reduced, in order to limit the amount of packaging material and the relative costs required.

[0005] Thus, within the scope of the requirements mentioned above, the objective of the present invention is that of manufacturing a suction device with improved structure, quick and easy to use by any user.

[0006] Another objective of the present invention is that of manufacturing a suction device with improved structure, of small dimensions both under operating and non-operating conditions.

[0007] Further objective of the invention is that of manufacturing a suction device with improved structure being extremely reliable, easy to use and of particular interest for the market, alongside being substantially economical, due to the advantages attained.

[0008] These and other objectives are attained by a suctioned device with improved structure, as described subsequently according to one of its exemplifying and non-limiting preferred embodiments and according to claim 1 attached.

[0009] The dependent claims provide for other characteristics of details of the invention.

[0010] Further objectives and advantages of the present invention shall be clear from the following description and attached drawings, provided solely for exemplifying and non-limiting purposes, wherein:

- Figure 1 is a partially exploded perspective view of the head of a suction device with improved structure, manufactured according to the present invention;
- Figure 2 is an exploded perspective view of the head of figure 1, according to the present invention.

[0011] It should be primarily observed that even though the special construction subject of the present invention is subsequently described with reference to the to a particular type of suction device, particularly used for solids, the same can be analogously applied to any type of suction device, both for solids and liquids, and also to pond-cleaning and/or pool-cleaning devices.

[0012] With reference to the abovementioned figures, the head, generally indicated by 20, of the suction device, according to the present invention, comprises a lower cover 2 for accommodating a suction filter, an intermediate shaped cover 3 and an upper cover 4, which accommodate a handle 6, useable for moving the suction device, a switch 5 for switching the suction device running motor on and off, and an electric socket 8.

[0013] Furthermore, the upper cover 4 is provided with a housing for a press-button 10, adapted to engage, according to the direction of arrow F of figure 2, a winding lever 11 of a cable-winding device 1, arranged below a fixing plate 7 and comprises a drum 12, made up of a pair of plates, within which at a suitable housing 14, the power supply cable 13 is wound, held in position during movement, by a return spring (not shown in the drawings attached).

[0014] In such manner, it is possible to unwind the cable 13, coming from the head 20 at the channel 15 made on the intermediate shaped cover 3, for one or more sections of desired length, in order to connect the plug 9 to a power supply socket and thus allow the suction operation, under normal conditions of use.

[0015] Analogously, upon conclusion of the operation, it is possible to rewind the electrical cable 13 into the head 20 of the suction device, by simply operating on button 10, which when pressed triggers the operation of the lever 11 and, consequently, the operation of the return spring of the cable-winding device 1, which, by rotating the drum 12, causes the winding of the cable 13 inside the housing 14 of the drum 12.

[0016] The special construction characteristic of the head 20 also allows keeping the encumbrance determined by mounting of the cable-winding device 1 inside the cover 4 within reasonable limits.

[0017] This, as a matter of fact, is basically obtained by mounting the cable-winding device 1 in a vertical position inside the cover 4 and, hence, creating a shaped seat 16 on the surface 17 of the base 19 of the intermediate cover 3, inside which the drum 12 of the cable-winding device 1 is housed vertically.

[0018] The abovementioned drum 12 of the cable-winding device 1 is also held in position by means of the fixing plate 7, which connects the appendices 18, arranged to accommodate the plates of the drum 12 on the sides.

[0019] Further mechanical and electrical insulation of the cable-winding device 1 from the rest of the electromechanical components of the head 20 is provided, in such a manner to avoid inconveniences deriving from electromagnetic phenomena, mechanical vibrations

and/or electrical shocks, prevented by the interposition of the shaped wall 21, which extends vertically substantially at the diameter of the base 19 of the intermediate cover 3.

[0020] In such manner, easy and quick use of the suction device by the user is ensured and, thus extremely reducing at the same time the overall dimension of the head 20, which, instead of a slight increase of volume, with respect to the traditional structures, provides for the possibility to mount an automatic power supply cable winding device, hence avoiding use of hooks or other general support elements for the cable sections, which, in such manner, would overly increase complications in use and the overall dimensions of the suction device, with the relative risks the user would be exposed to.

[0021] The description above clearly outlines the characteristics and the advantages of the suction device with improved structure, which is the subject of the present invention.

[0022] In particular, the advantages of the suction device of the invention are:

- Practical in use, both under operating and non-operating conditions;
- Reliable in use and does not expose the user to hazards;
- Occupies little space;
- Low costs of production, considering the advantages attained.

[0023] Lastly, it is clear that other several adjustments can be performed on the suction device in question, without for this reason departing from the novelty principles inherent to the inventive idea. Likewise, it is clear that, the materials, shapes and dimensions of the details illustrated may vary depending on the requirements and the same can be replaced by others technically equivalent.

Claims

1. Suction device with improved structure, of the type comprising a head (20), which includes at least a first cover (2), for accommodating at least one filtering element of said suction device, and at least a second cover (4), arranged over the first cover (2) for closing the head (20), **characterised in that** accommodated inside said head (20) there is at least one cable-winding device (1) made up of at least one rotating drum (12) with plates, adapted to determine at least one housing (14) for positioning at least one power supply cable (13) of the suction device, during automatic winding of said cable (13) by means of said cable-winding device (1).

2. Suction device according to claim 1, **characterised in that** said first cover (2) is connected to said second cover (4), through at least a third intermediate cover (3).

3. Suction device according to claim 2, **characterised in that** said cable-winding device (1) is mounted vertically inside said second cover (4) of the head (20) and it is accommodated inside at least one shaped seat (16), made on a base (19) of said intermediate cover (3), in such a manner to accommodate the dimension of the structure.

4. Suction device according to claim 1, **characterised in that** accommodated on said second cover (4) of the head (20) there are at least a handle element (6), for moving and transferring the suction device, and at least a switch (5) for switching the suction device running motor on and off.

5. Suction device according to claim 1, **characterised in that** from said second cover (4) of the head (20) projects at least one press button (10) adapted to trigger at least one lever (11) of said cable-winding device (1) for automatic winding of the power supply cable (13) of the suction device, said cable (13) being held in position by at least a return spring element.

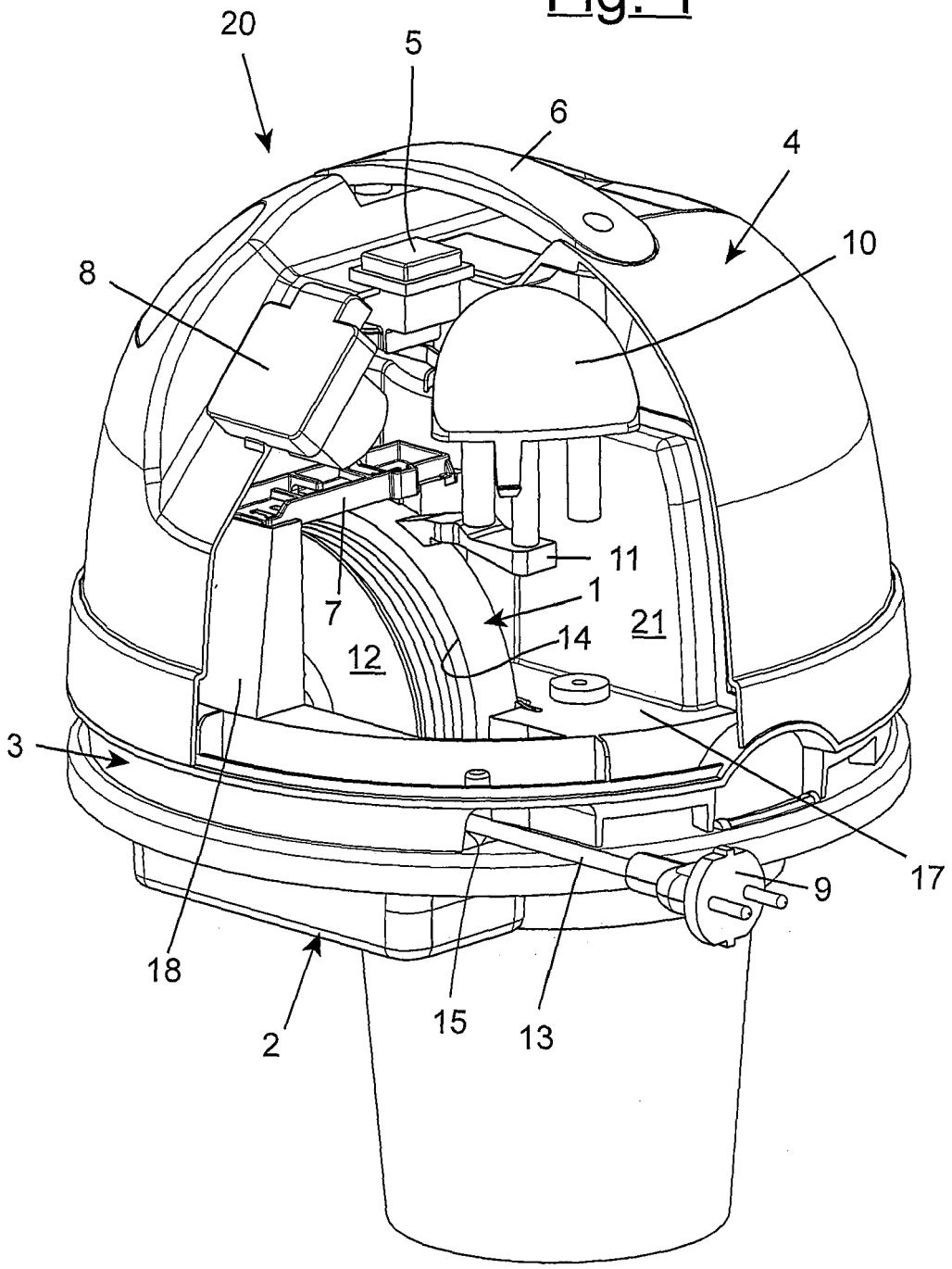
6. Suction device according to claim 2, **characterised in that** said power supply cable (13) projects from the head (20) of the suction device at at least one channel (15) made on said intermediate cover (3).

7. Suction device according to claim 1 **characterised in that** said rotating drum (12) is vertically mounted inside the head (20) and is held in position through at least one fixing plate (7), which connects respective appendices (18), arranged on the sides of the plates of the rotating drum (12).

8. Suction device according to claim 3, **characterised in that** mounted on said base (19) of the intermediate cover (3) is at least a vertical wall (21), which substantially extends at the diameter of said base (19), in order to attain a mechanical and electrical insulation of said cable-winding device (1) from other electromechanical components mounted inside the head (20) of the suction device.

9. Suction device according to claim 1, **characterised in that** it can be used as a suction device both for solid and/or liquid substances and/or as a pond-cleaning and/or pool-cleaning suction device.

Fig. 1



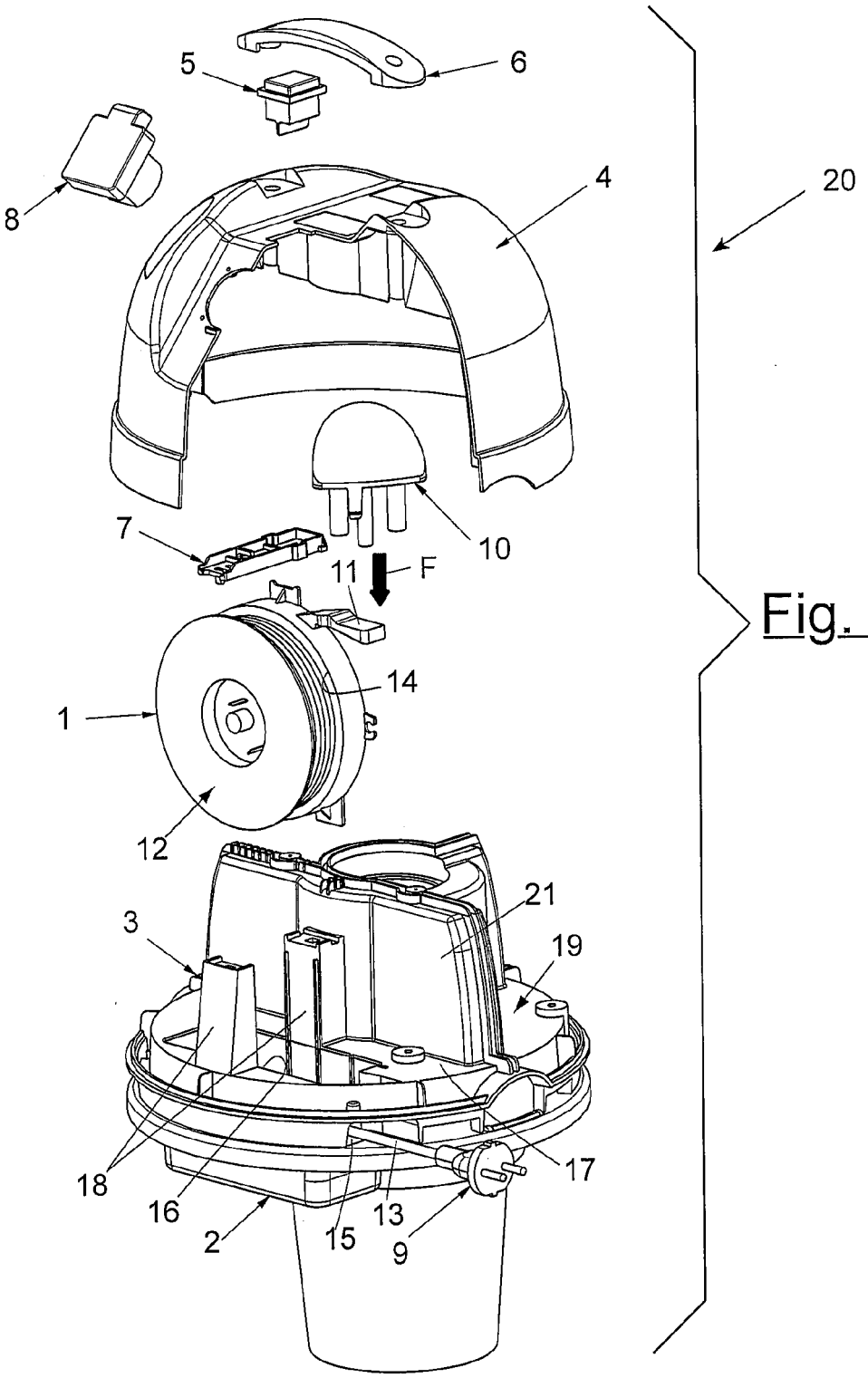


Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 07 12 4128

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	GB 2 341 539 A (BEARD MICHAEL ANDREW [GB]) 22 March 2000 (2000-03-22) * page 4, line 12 - page 8, line 20 *	1-9 8,9	INV. A47L5/36 A47L9/26
Y	US 6 052 862 A (LOWERY VERNON [US]) 25 April 2000 (2000-04-25) * column 1, line 64 - column 3, line 12 *	8,9	
A	FR 2 784 281 A (SEB SA [FR]) 14 April 2000 (2000-04-14) * page 3, line 7 - page 9, line 10 *	1-9	
A	DE 198 05 557 A1 (BOSCH SIEMENS HAUSGERAETE [DE] BSH BOSCH SIEMENS HAUSGERAETE [DE]) 12 August 1999 (1999-08-12) * column 1, line 8 - column 2, line 30 *	1-9	
A	US 5 255 768 A (KASPER GARY A [US] ET AL) 26 October 1993 (1993-10-26) * column 2, line 45 - column 3, line 14 *	1-9	

TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	27 May 2009	Martin Gonzalez, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 12 4128

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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27-05-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2341539 A	22-03-2000	NONE	
US 6052862 A	25-04-2000	AU 3492000 A	04-09-2000
		CA 2362138 A1	24-08-2000
		EP 1161172 A1	12-12-2001
		MX PA01008232 A	23-10-2002
		WO 0048503 A1	24-08-2000
FR 2784281 A	14-04-2000	DE 69930097 T2	26-10-2006
		EP 0995392 A1	26-04-2000
DE 19805557 A1	12-08-1999	NONE	
US 5255768 A	26-10-1993	NONE	

EPO FORM P0459

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