(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 862 575 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.12.2007 Bulletin 2007/49

(51) Int Cl.:
D06F 35/00 *(2006.01)* ***D06F 58/20*** *(2006.01)*

(21) Application number: **06011418.8**

(22) Date of filing: **01.06.2006**

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

(71) Applicant: **Electrolux Home Products Corporation N.V.**
1930 Zaventem (BE)

(72) Inventors:
- **Sartor, Luciano**
  31015 Conegliano (IT)
- **Arreghini, Luigi**
  30020 Portogruaro (VE) (IT)
- **Lampe, Hansjörg**
  90491 Nürnberg (DE)
- **Klug, Hans-Joachim**
  90610 Winkelhaid (DE)
- **Quaroni, Riccardo**
  33090 Arzene (PN) (IT)
- **Loy, Thomas**
  90427 Nürnberg (DE)

(74) Representative: **Baumgartl, Gerhard Willi**
AEG Hausgeräte GmbH,
Patente, Marken & Lizenzen
90327 Nürnberg (DE)

(54) Domestic appliance with a steam unit constructed as a module

(57) The invention relates to a domestic appliance (1), especially to a dryer or a washing machine. To facilitate the equipment of the appliance with a possibility for steam treatment the invention proposes that the appliance has a steam unit (2) for producing water steam, especially hot or superheated steam, which is fed to a treatment area (3), especially to a drum, wherein the steam unit (2) is constructed as a module.

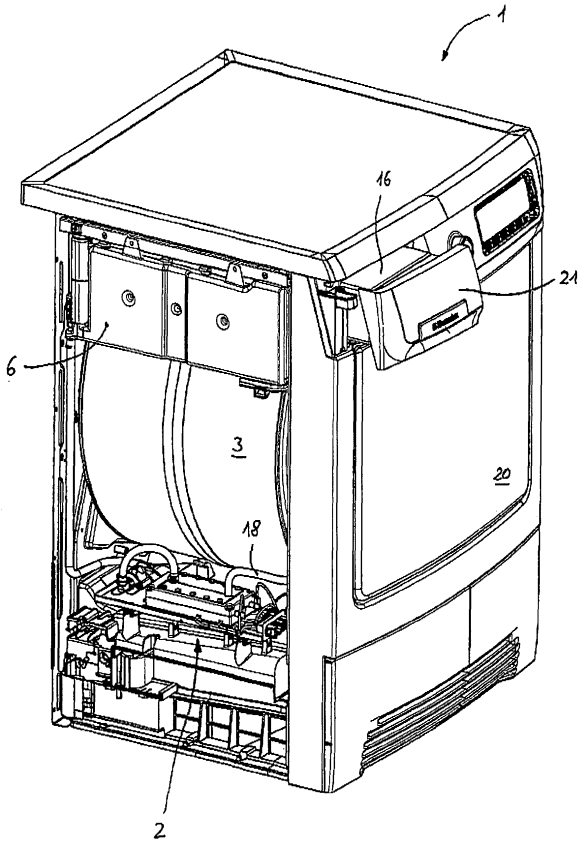

FIG 3

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Description

[0001] The invention relates to a domestic appliance, especially to a dryer for textiles or a washing machine.

[0002] Domestic appliances are well known in the state of the art. It is known to wash and to dry textiles by them. Dryers usually use a condensation process or a wet exhausting air process.

[0003] It has been found that the quality of the treatment of textiles can be improved by using steam which is applied to the textiles. This applies especially for washing machines and for dryers. By doing so unwanted odours can be removed. Also a beneficial steam treatment of the textiles can occur. For this purpose water steam, particularly hot or superheated water steam is fed into the treatment area, which is usually a drum which contains the textiles. For this the washing machine or the dryer needs to have a steam unit.

[0004] A problem is that the supply of a domestic appliance with the possibility to apply steam to the textiles is often quite complex. The system has to be supplied with the different elements so that the production of steam can take place in a controlled manner. Also the steam producing device needs different peripheral elements.

[0005] Usually, the different elements of a steam producing appliance have to be mounted into the domestic appliance. This takes not only time but demands also a certain logistic effort. Consequently, the equipment of steam producing devices in domestic appliances is very costly, especially when it comes to the assembly of the different components which are required for the steam system.

[0006] Another problem is that the place for putting the different components of the steam system must be carefully defined when a domestic appliance is designed. This also leads to high costs because it has to be done for each single type of domestic appliance.

[0007] Therefore, in addition the logistics to make sure that all relevant types of domestic appliances can be supplied with the required components become quite extensive.

[0008] Another problem is that it is quite costly to maintain or to repair domestic appliances with steam producing systems. The disassembly and the assembly of broken components takes a quite long time which leads to comparatively high costs for the assembler.

[0009] Therefore, it is an object of the present invention to propose a domestic appliance, especially a home dryer or a washing machine, which allows an improved assembly of the components which are required for equipping the appliance with the steam producing system. Also, it is desired that the service effort is decreased to save costs in connection with the maintenance of the appliance. Furthermore, the costs for logistics are aimed to be reduced. Especially a solution is sought which facilitates the supply of the required components for equipping the appliance with the steam system.

[0010] This object is achieved by a domestic appliance according to claim 1. Preferred embodiments are mentioned in the dependent claims.

[0011] According to claim 1 the invention is characterized in that the domestic appliance has a steam unit for producing water steam, especially hot or superheated steam, which is fed to a treatment area, especially to a drum, wherein the steam unit is constructed as a module.

[0012] I. e. the invention suggests to design a steam producing system as a module which contains at least the most essential elements for steam production. Preferably, the modular steam unit comprises a steam generator. Also it can comprise a pump. Furthermore, a water reservoir, a safety device and/or an electronic controlling device can be arranged in the steam module.

[0013] Beneficially, the modular steam unit comprises an electric wrap connection device. This device can be connected with a controlling device of the appliance. With this design it is very easy to mount or to dismount the steam unit in the domestic appliance by using wrap connection means.

[0014] For mechanically placement of the steam unit in the domestic appliance it can be mounted in the appliance by means of quick release fastener elements. Those quick release fastener elements can comprise snap connection means. Furthermore this connection means can comprise receiving means that fit into holes in the module. The module in this case is set on the receiving means via a vertical movement and affixed by an additional horizontal movement, whereby a horizontal groove in the receiving means slides into a corresponding recess in the module.

[0015] An easy mounting and dismounting can be reached when the components of the steam unit are arranged on a base plate. Furthermore, the domestic appliance can comprise at least one reception slot and/or receiving means for guiding and receiving the base plate. With this feature the whole steam unit can be mounted into the appliance very easily. Preferably the receiving means are made of temperature resistant materials, especially plastics. The material should be resistant to temperatures at least over 200°C.

[0016] Furthermore, the steam unit can be arranged in a side region within the appliance. Also the location for the steam unit can be in an upper or a lower region within the appliance. Also an arrangement of the steam unit in the basement region / on the basement of the domestic appliance is possible.

[0017] The domestic appliance can be a dryer for textiles, particularly a condensation type dryer.

[0018] The proposed concept is also very useful for washing machines, particularly domestic washing machines.

[0019] In case of a dryer or a washing machine the module is preferably arranged between a side panel of the dryer and the drum of the appliance.

[0020] Preferably, the steam unit is designed as a retrofit kit. So easy retrofitting of existing domestic appliances becomes possible.

[0021] According to the invention the domestic appliance, especially the dryer, has an additional steam functionality, especially a hot steam or superheated steam functionality. Due to the modular design of the steam unit which has to be integrated into the appliance assembly and disassembly becomes very easy and cheap. It can be mounted very quickly by using quick release means for carrying the steam unit. Furthermore, it is easily possible to retrofit the steam unit in an existing appliance.

[0022] Not only assembly/disassembly becomes very easy when employing the invention, also the design of the domestic appliance becomes very universal. The diversity of components which are necessary is reduced in spite of an increasing variety of types of domestic appliances.

[0023] In the drawings an embodiment of the invention is depicted.

FIG 1 shows schematically an example of a home dryer according to the invention in the front elevation,

FIG 2 shows schematically a top view of the module placed within the dryer shown in FIG 1,

FIG 3 shows another example of a home dryer according to the invention, and

FIG 4 shows in an magnification a part of FIG 3 that shows the steam unit module.

[0024] In FIG 1 a domestic appliance 1 in the form of a home dryer for drying textiles is shown wherein the drying of the textiles occurs in a well known manner. The textiles (not depicted) are placed in a drum 3, which is generally a treatment area. The drum 3 is closed by a door 20. Here, the dryer 1 is designed as a dryer of the condensation type. I. e. is has a condensate reservoir 16 in which water is collected which is extracted from the wet textiles.

[0025] To improve the quality of the treatment of the textiles a steam process is carried out in the dryer 1. Steam, i. e. hot or superheated steam, is applied to the textiles in the drum 3 of the dryer 1. For this a modular steam unit 2 for the production of the steam is arranged within the dryer 1. A water reservoir 6 to supply the steam unit is placed in a side region 13 of the dryer 1, in an upper region 14, close to a side panel 17 of the dryer 1 and between the side panel 17 and the condensate reservoir 16. The condensate reservoir 16 is arranged as part of a drawer (not depicted) that could be removed from the dryer 1 to empty it. A front panel 21 of this drawer can be seen in FIG 1. This front panel 21 additionally covers at least a part of the water reservoir 6.

[0026] The steam unit 2 is designed as a compact and modular element. Therefore, the whole steam unit 2 can be assembled or disassembled into or from the dryer 1.

[0027] As can be seen from FIG 1 the steam unit 2 is arranged in the left part, i. e. in the side region 13, of the dryer in a lower region 15, especially between the drum 3 and a side panel 17 of the dryer 1. It is also possible to locate the steam unit 2 in an upper region 14 of the appliance 1.

[0028] Details of the steam unit 2 become apparent from FIG 2. As can be seen here, the steam unit 2 comprises different components, i. e. a steam generator 4, which is supplied with water from the water reservoir 6 by means of a pump 5, which is also arranged within the steam unit 2. Steam generator 4 and pump 5 are fixed on a base plate 11 which is received in receiving means 12 arranged at the dryer 1, which are shown only schematically. It can be seen that this receiving means 12 fit into holes 22 in the base plate 11. The base plate 11 is set on the receiving means 12 via a vertical movement and affixed by an additional horizontal movement, whereby a horizontal groove (not depicted) in the receiving means 12 slides into a corresponding recess 23 in the base plate 11.

[0029] Alternatively different quick releasing means can be provided, which make sure that the base plate 11 carrying the different parts of the steam unit 2 is firmly located in the domestic appliance 1.

[0030] Furthermore, the water reservoir 6 can be arranged as additional part of the modular steam unit 2 (not depicted), e.g. by arranging it on the top of the steam generator 4 and/or the pump 5.

[0031] The steam produced by the steam generator 4 is supplied via a steam tube 18 to an outlet nozzle 19 and into the drum 3.

[0032] Furthermore, it is only depicted schematically that the steam unit 2 has also a safety device 7 and an electronic controlling device 8. Furthermore, an electric wrap connection device 9 is arranged to establish the electrical connection with the controlling device 10 of the dryer 1 (see FIG 1). One part 9' of the electric wrap connection device 9 is fixed on the base plate 11 and another part 9" of the electric wrap connection device 9 can be connected with the domestic appliance 1. When inserting the base plate 11 into the domestic device 1 by sliding it in horizontal direction, the electrical connection is achieved automatically, as the two parts 9' and 9" come into contact.

[0033] Alternatively it is possible to use plug connector and socket as electric wrap connection device. In this case the electrical connection between steam unit and controlling device of the dryer can be done by just connecting the connector with the socket.

[0034] The water reservoir 6 allows the storage and the supply of clean and decontaminated water for the steam production. As shown in FIG 1, it is designed in that way that it becomes very small to use a free space between the condensate reservoir 16 and the side panel 17.

[0035] The different components can be fixed on the base plate 11 using several bolts which are arranged on the base plate, e. g. four bolts, which are connected with

the components to arrange them firmly to the base plate 11.

[0036] FIG 3 shows another example of a home dryer 1 according to the invention. The side panel is removed, therefore the arrangement of the water reservoir 6 and the steam unit module 2 in the dryer 1 can be seen. FIG 4 shows in a magnification of FIG 3 the arrangement of the steam unit 2. The steam generator 4, the pump 5, the base plate 11 and the receiving means 12 arranged at the dryer 1 to receive the base plate 11 can be seen.

Reference Numerals

[0037]

1	Domestic appliance
2	Steam unit
3	Treatment area (drum)
4	Steam generator
5	Pump
6	Water reservoir
7	Safety device
8	Electronic controlling device
9, 9', 9"	Electric wrap connection device
10	Controlling device
11	Base plate
12	Receiving means
13	Side region
14	Upper region.
15	Lower region
16	Condensate reservoir
17	Side panel
18	Steam tube
19	Outlet nozzle
20	Door
21	Front Panel
22	Hole
23	Recess

Claims

1. Domestic appliance (1),
wherein the appliance has a steam unit (2) for producing water steam, especially superheated steam, which is fed to a treatment area (3), especially to a drum,
wherein the steam unit (2) is constructed as a module.

2. Domestic appliance according to claim 1, **characterized in that** the modular steam unit (2) comprises a steam generator (4).

3. Domestic appliance according to claim 1 or 2, **characterized in that** the modular steam unit (2) comprises a pump (5).

4. Domestic appliance according to at least one of claims 1 till 3, **characterized in that** the modular steam unit (2) comprises a water reservoir (6).

5. Domestic appliance according to at least one of claims 1 till 4, **characterized in that** the modular steam unit (2) comprises a safety device (7).

6. Domestic appliance according to at least one of claims 1 till 5, **characterized in that** the modular steam unit (2) comprises an electronic controlling device (8).

7. Domestic appliance according to at least one of claims 1 till 6, **characterized in that** the modular steam unit (2) comprises an electric wrap connection device (9, 9', 9'').

8. Domestic appliance according to claim 7, **characterized in that** the electric wrap connection device (9'') is connected with a controlling device (10) of the appliance (1).

9. Domestic appliance according to at least one of claims 1 till 8, **characterized in that** the steam unit (2) is mounted in the appliance (1) by means of quick release fastener elements.

10. Domestic appliance according to claim 9, **characterized in that** quick release fastener elements comprise snap connection means.

11. Domestic appliance according to at least one of claims 1 till 10, **characterized in that** the components of the steam unit (2) are arranged on a base plate (11).

12. Domestic appliance according to claim 11, **characterized in that** it comprises at least one reception slot and/or receiving means (12) for guiding and receiving the base plate (11).

13. Domestic appliance according to claim 12, **characterized in that** the receiving means (12) are made of temperature resistant materials, especially plastics.

14. Domestic appliance according to at least one of claims 1 till 13, **characterized in that** the steam unit (2) is arranged in a side region (13) within the appliance (1).

15. Domestic appliance according to at least one of claims 1 till 13, **characterized in that** the steam unit (2) is arranged in an upper region (14) within the appliance (1).

16. Domestic appliance according to at least one of

claims 1 till 13, **characterized in that** the steam unit (2) is arranged in a lower region (15) within the appliance (1).

17. Domestic appliance according to at least one of claims 1 till 16, **characterized in that** it is a dryer for textiles.

18. Domestic appliance according to claim 17, **characterized in that** the dryer (1) is of the condensation type.

19. Domestic appliance according to at least one of claims 1 till 16, **characterized in that** it is a washing machine.

20. Domestic appliance according to at least one of claims 1 till 18, **characterized in that** the steam unit (2) is designed as a retrofit kit.

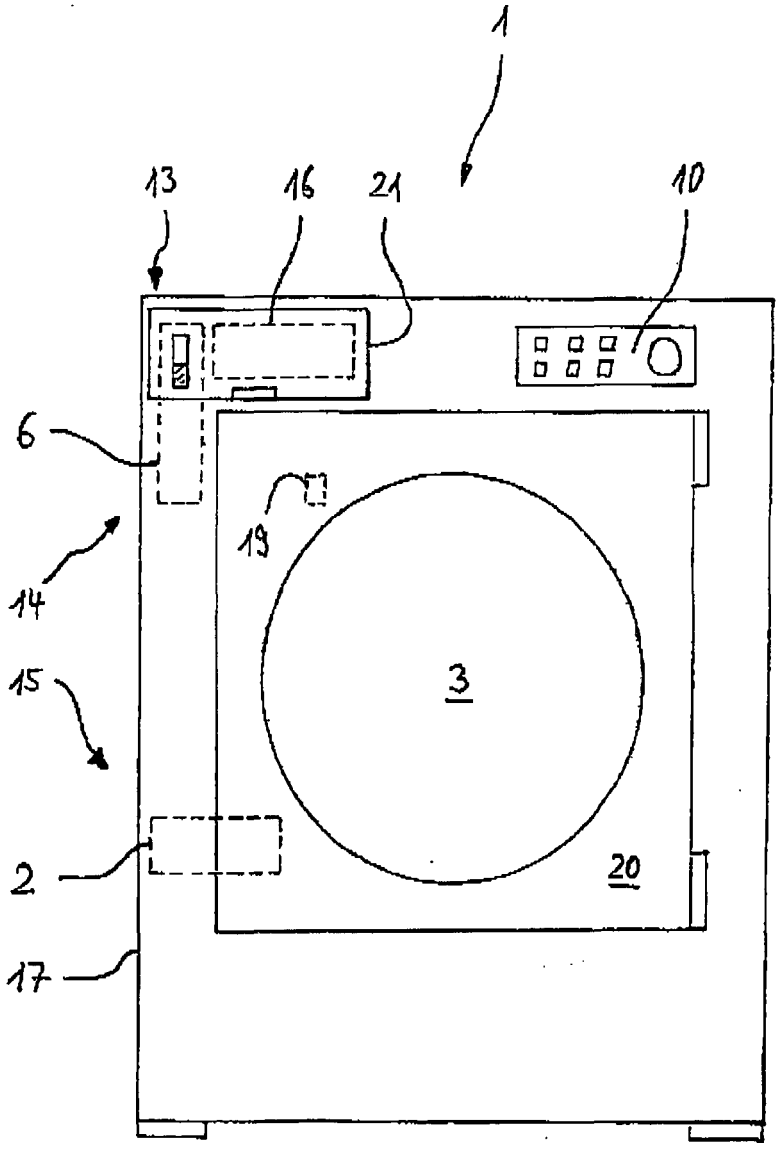

FIG 1

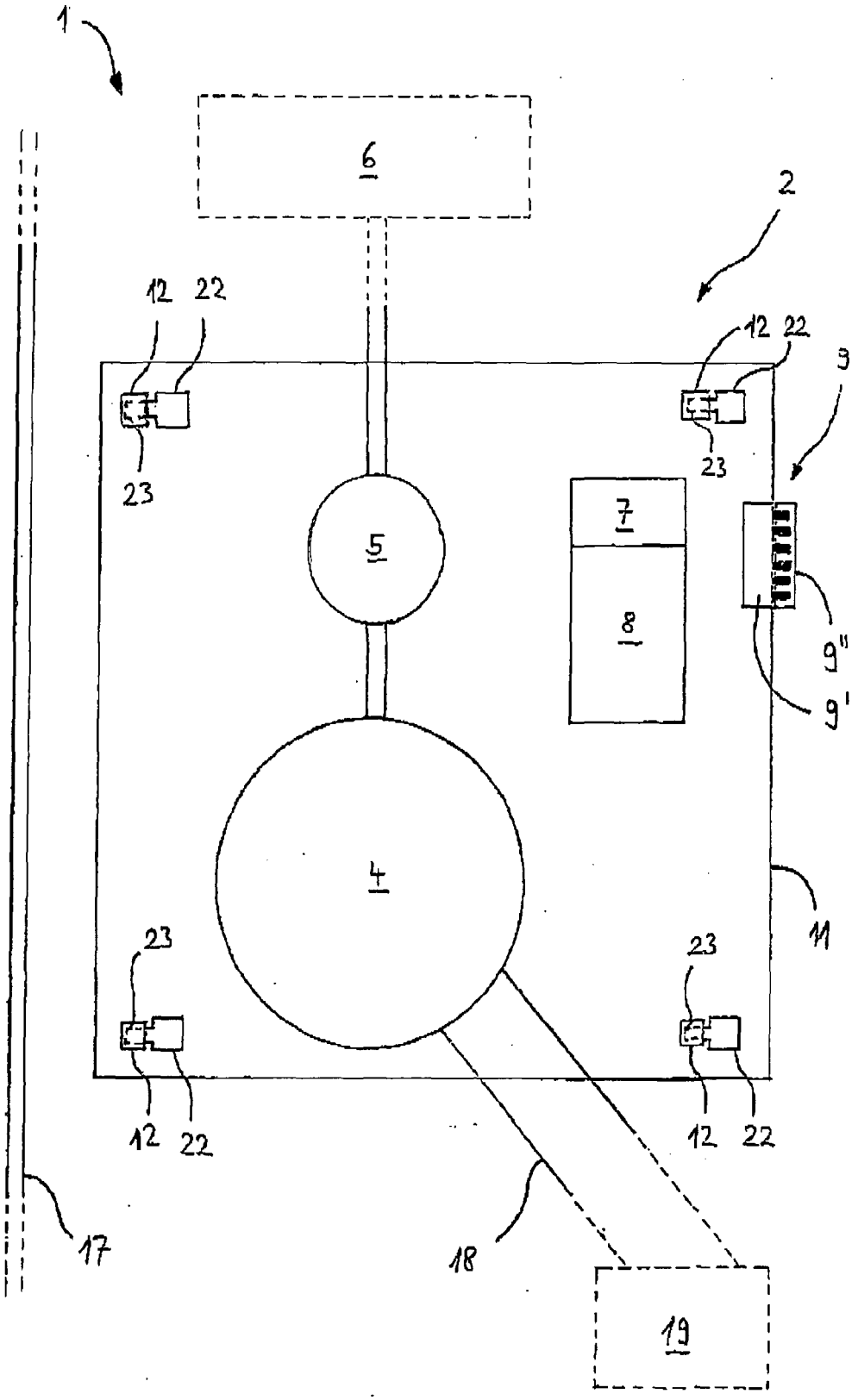

FIG 2

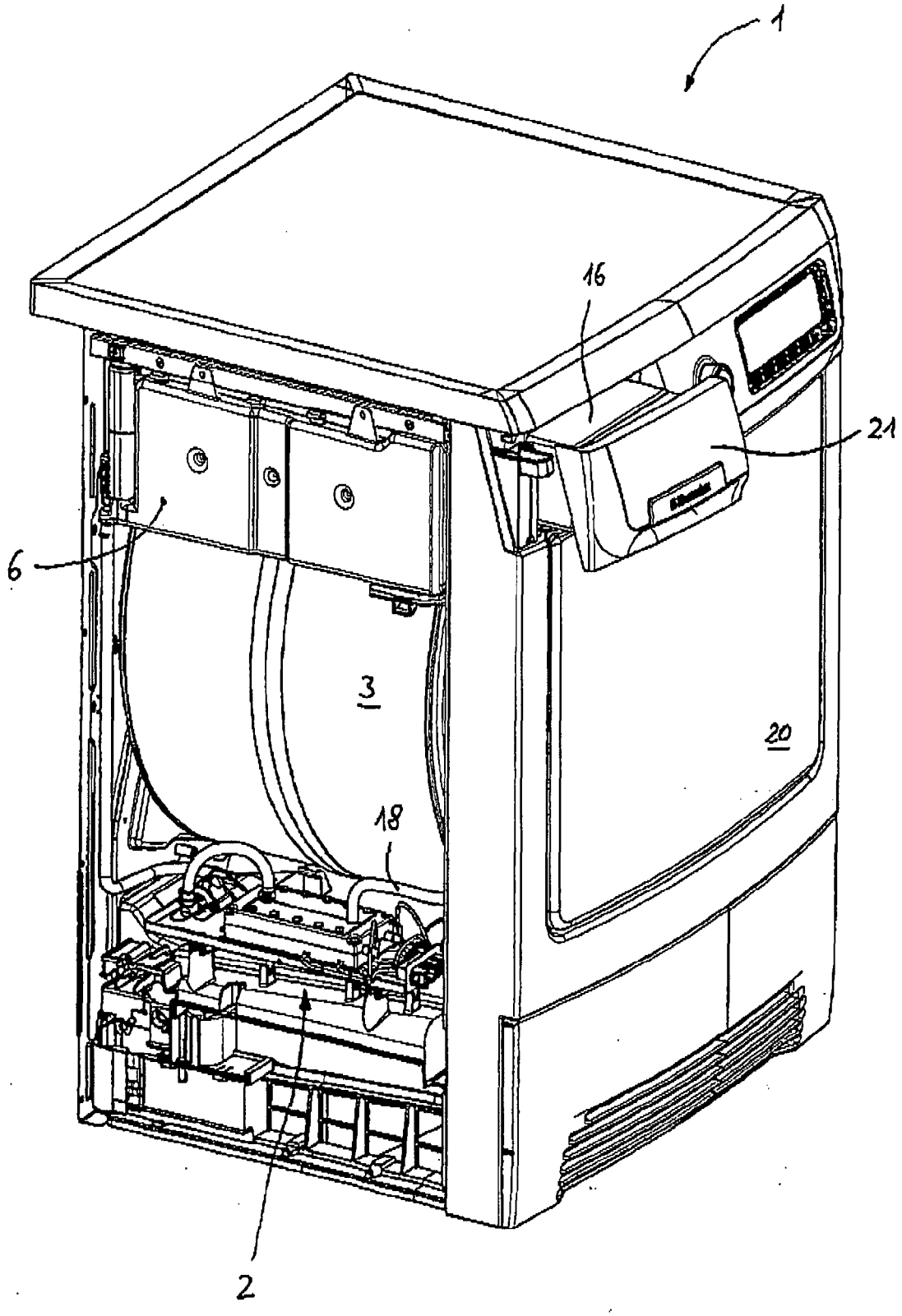

FIG 3

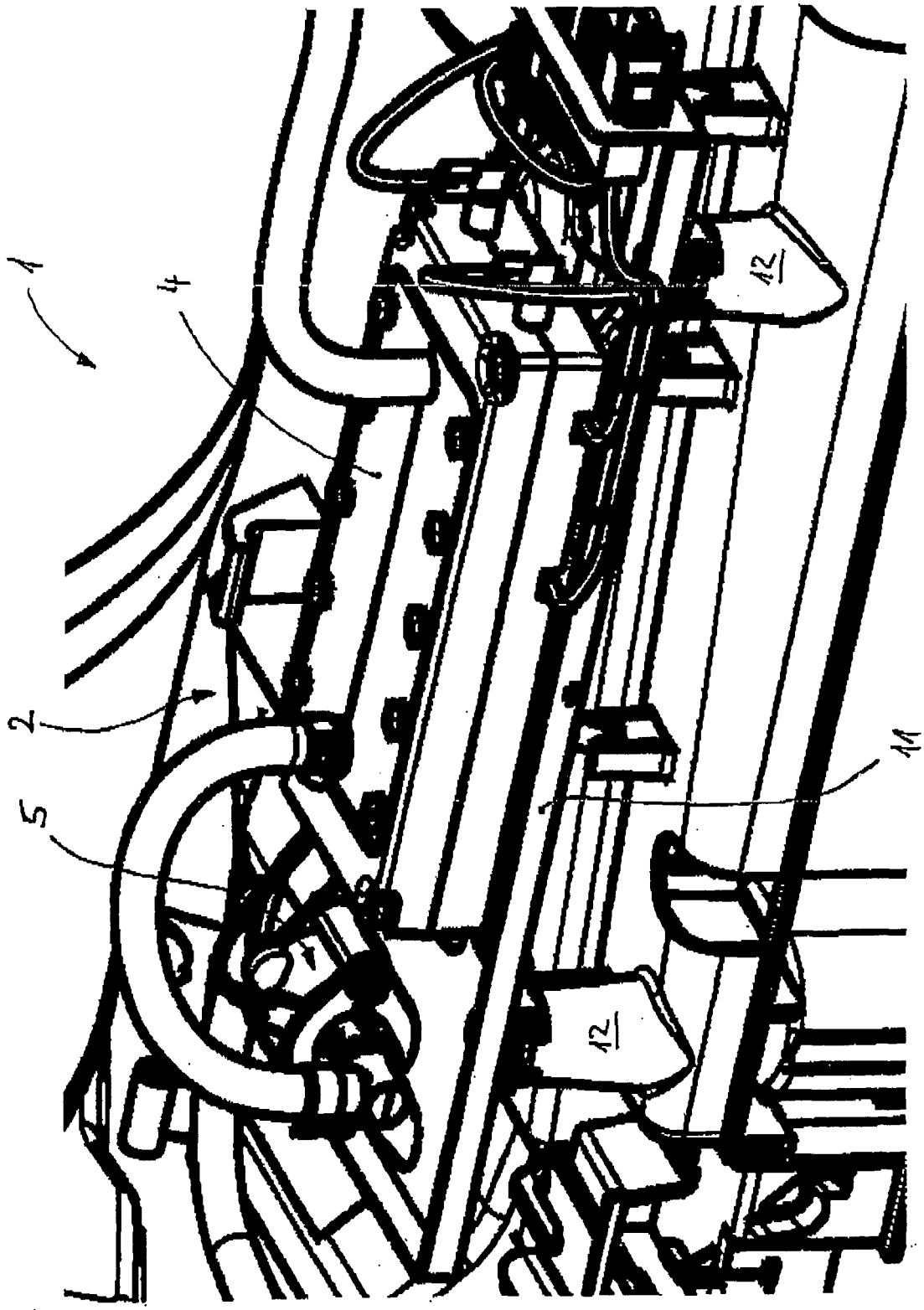

FIG 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 01 1418

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	US 2006/016020 A1 (PARK SEOK K [KR]) 26 January 2006 (2006-01-26) * abstract; figures * -----	1,2,4, 11,14, 15,19	INV. D06F35/00 D06F58/20
X	EP 1 600 545 A (SAMSUNG ELECTRONICS CO LTD [KR]) 30 November 2005 (2005-11-30) * abstract; figures * -----	1,2,4, 11,14, 15,19	
X	US 2005/034489 A1 (OH SOO YOUNG [KR] ET AL) 17 February 2005 (2005-02-17) * abstract; figures * -----	1,2,4, 14,15,19	
X	EP 1 655 408 A (SAMSUNG ELECTRONICS CO LTD [KR]) 10 May 2006 (2006-05-10) * abstract; figures * -----	1,2,4, 15,19	
X	EP 1 441 060 A (ELECTROLUX HOME PROD CORP [BE]) 28 July 2004 (2004-07-28) * paragraph [0026]; figures * -----	1,2,4, 17,18	
A	EP 1 469 120 A (LG ELECTRONICS INC [KR]) 20 October 2004 (2004-10-20) * the whole document * -----	1-20	TECHNICAL FIELDS SEARCHED (IPC) D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 November 2006	DIAZ, M

CATEGORY OF CITED DOCUMENTS

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15-11-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006016020 A1	26-01-2006	WO 2006009364 A1	26-01-2006
EP 1600545 A	30-11-2005	CN 1702225 A	30-11-2005
		JP 2005334635 A	08-12-2005
		KR 20050112232 A	30-11-2005
		US 2005262644 A1	01-12-2005
US 2005034489 A1	17-02-2005	CN 1580371 A	16-02-2005
		KR 20050018183 A	23-02-2005
EP 1655408 A	10-05-2006	JP 2006130295 A	25-05-2006
		US 2006096333 A1	11-05-2006
EP 1441060 A	28-07-2004	DE 10302866 A1	12-08-2004
EP 1469120 A	20-10-2004	CN 1537995 A	20-10-2004
		CN 1818189 A	16-08-2006
		CN 1818191 A	16-08-2006
		JP 2004313793 A	11-11-2004
		US 2004255391 A1	23-12-2004

EPO FORM P0459

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