



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**10.12.2003 Bulletin 2003/50**

(51) Int Cl.7: **D06F 29/00**

(21) Application number: **03076666.1**

(22) Date of filing: **30.05.2003**

(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**

(72) Inventor: **Fumagalli, Silvano**  
**20052 Monza (MI) (IT)**

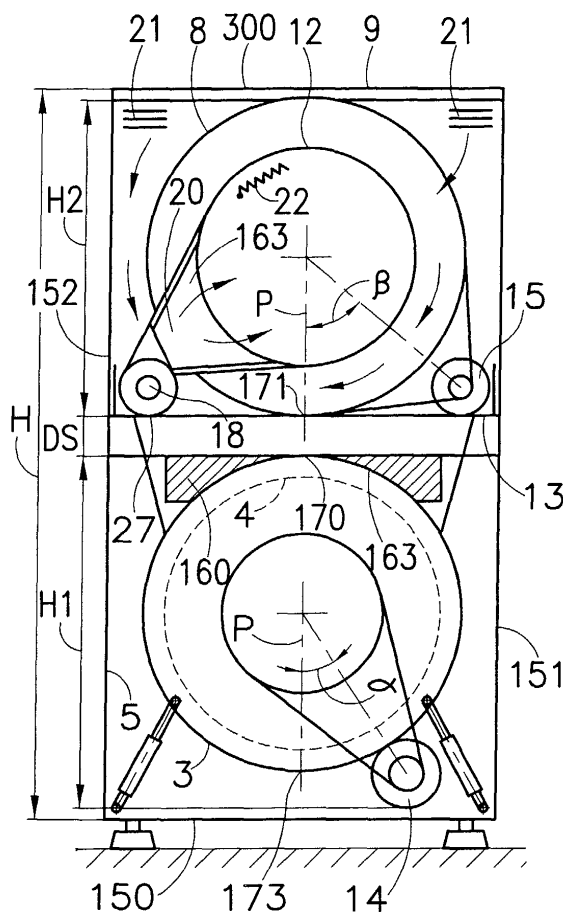
(74) Representative: **Mittler, Enrico**  
**c/o Mittler & C. s.r.l.,**  
**Viale Lombardia, 20**  
**20131 Milano (IT)**

(30) Priority: **03.06.2002 IT MI20021193**

(71) Applicant: **CANDY S.p.A.**  
**I-20052 Monza (Milano) (IT)**

(54) **Laundry washer and dryer machine**

(57) A laundry washer and dryer machine is described comprising a washing device (1) and a drying device (7) located inside a single cabinet (2) in which said drying device (7) is superimposed onto said washing device (1). The latter comprises a washing tub (3) inside which a first basket (4) is housed that is suitable to contain the laundry to be washed and said drying device (7) comprising a second basket (8) that is suitable to contain the laundry to be dried and at least one motorised fan (18; 31, 33) and resistors (22) for the circulation of warm air suitable to dry the laundry contained in basket (8). The machine comprises two motors (14, 15) for the movement of said first (4) and second baskets (8). The motor (15) for the movement of said second basket (8) and the at least one motorised fan (18; 31, 33) are arranged on respective angular supports (13, 27) of the cabinet (2) in proximity of its side walls (151, 152) and on top of the washing tub (3) in such way that the distance (DS) between the top end (170) of said washing tub (3) and the bottom end (171) of said drying basket (8) is shorter than the distance between the bottom end (173) of the washing tub (3) and the bottom (150) of the cabinet (2).



**FIG. 4**

## Description

[0001] The present invention refers to a laundry washer and dryer machine.

[0002] Generally household laundry washer and dryer machines are known that are made up of a single tub and basket unit and that allow to carry out the washing and the drying of the laundry at subsequent times.

[0003] In such machines the washing basket has a containment capacity that does not allow the drying of the previously washed laundry in a single solution; therefore it is necessary to subdivide the washed laundry into parts in order to provide the drying of the single parts thus determining an excessive duration of the drying procedure and a greater consumption of electric power.

[0004] In addition so-called washer and dryer columns are known that are made up of two completely independent and separate machines, a dryer machine that is superimposed by means of an appropriate coupling frame onto a washing machine.

[0005] Such washer and dryer machine columns allow to wash and subsequently to dry the entire load of laundry in a single solution.

[0006] However such columns take up large spaces and determine a doubling of the devices, as for instance some elements of the cabinet, the driving motors and the control panels.

[0007] In the European patent application EP 209088 a laundry washer-dryer machine is described that comprises, within a single cabinet structure, a drying device and a washing device provided with relative baskets to contain the laundry that are driven by a single motor. The machine is provided with a single-piece unit that belongs to a drying air circuit and that can oscillate, around the loading opening of the dryer machine, between a position of engagement with and one of disengagement from the motor. There are provided means for the transmission of the movement to the basket and to the drying fan, means to carry out the oscillation of the unit and means that assure the transmission of the movement between the motor and the drying device.

[0008] An evident disadvantage of such washing-drying machine resides in its size in height that determine a difficult positioning in the rooms where they are utilised.

[0009] In view of the state of the art described, scope of the present invention is to provide a washing and drying machine that takes up less space than the known machines.

[0010] According to the present invention, such scope is attained by means of a laundry washer and dryer machine comprising a washing device and a drying device arranged inside a single cabinet in which said drying device is superimposed onto said washing device, said washing device comprising a washing tub inside which a first basket that is suitable to contain the laundry to be washed is housed and said drying device comprising a

second basket that is suitable to contain the laundry to be dried and at least a motorised fan and resistors for the circulation of warm air for the drying of the laundry contained in the basket, characterised in that it comprises two motors for the movement of said first and second baskets, and in that the motor for the movement of said second basket and the at least one motorised fan are located on respective angular supports of the cabinet in proximity of its side walls and above the washing tub in such a way that the distance between the upper end of said washing tub and the bottom end of said drying basket is shorter than the distance between the bottom end of the washing tub and the bottom of the cabinet.

[0011] Thanks to the present invention it is possible to provide a laundry washing dryer machine that in virtue of the smaller height than the known machines confers larger stability to the machine especially during the centrifugal stage of the washing device.

[0012] Preferably said laundry washer and dryer machine is also provided with a control device for the management of the washing and drying devices that allows to decrease the electric power consumption.

[0013] The characteristics and the advantages of the present invention will become evident from the following detailed description of an embodiment thereof, that is illustrated as a non-limiting example in the enclosed drawings, in which:

Figure 1 is a schematic front view of the machine according to a first embodiment of the invention;  
Figure 2 is a schematic side view of the machine in Figure 1;

Figure 3 is a layout of a control device of the machine in Figure 1;

Figure 4 is a schematic back view of the machine in Figure 1;

Figure 5 is a top view of the washing device of the machine in Figure 1;

Figure 6 is a schematic back view of a washing and dryer machine according to a second embodiment of the present invention;

Figure 7 is a schematic back view of a variation of the machine in Figure 6;

Figure 8 is a schematic side view of the machine in Figure 6 or 7;

Figure 9 is a top view of the machine in Figure 6 or 7.

[0014] With reference to Figures 1-5 a laundry washer and dryer machine according to a first embodiment of the invention is shown. Such machine comprises a cabinet 2 inside which, in the bottom part 5, a washing device 1 comprising a traditional type washing tub 3 that contains a basket 4 revolving about a horizontal axis and with front loading is housed.

[0015] The basket 4 is driven by an electric motor 14 arranged in proximity of the bottom 150 and of a side wall 151 (Figure 4).

[0016] The angle  $\alpha$  created between the vertical axis

P and the straight line connecting the centres of the washing tub 3 and of the electric motor 14 is preferably of  $27^\circ$ .

**[0017]** The tub 3 is elastically supported in the cabinet 1 and is provided with counterweights 160 and 161 arranged respectively in adjacent way to the cylindrical side surface of the top part 163 of the tub 3 and in adjacent way to the cylindrical side surface of the bottom part 164 of the same tub 3 (Figure 5).

**[0018]** The washing tub 3 is provided with a detergent charging device 600 traditionally positioned on the front wall of the cabinet 2 and other devices for the discharge of detergents and of the washing liquid that are part of a traditional washing machine. As an alternative a detergent charging device 601 can be located in the door assigned to close the opening of the basket 4 of the washing device 1.

**[0019]** On the top part 6 of the cabinet 2 a device 7 for the drying of the laundry is housed that is provided with a basket 8 revolving around a horizontal axis as well. Said basket 8 is supported, in a known way, both in the back wall 9 of the cabinet 2 by means of supporting means 10 as well as in the front wall 11 of cabinet 2 where it is provided with an opening 12 for the loading of the laundry to be dried. The basket 8 can preferably have a size larger than the basket 4 since it does not have to be subject to the centrifugal action.

**[0020]** The drying device 7 is provided with a motor 15 for the operation of the basket 8 that is arranged on an angular support 13 on top of the washing tub 3 and in proximity of side wall 151 of the cabinet 2. The angle  $\beta$  thus formed between the vertical axis P and the straight line connecting the centres of the drying basket 8 and of the electric motor 15 is preferably of approximately  $45^\circ$ .

**[0021]** In Figure 4 a circuit 20 for the drying of the laundry in the basket 8 is shown; said circuit comprises air inlets 21 arranged on the back wall 9 of the cabinet 2, electric resistors 22 arranged in proximity of the basket 8 and the motorised fan 18 housed in a back zone of the cabinet 2, in proximity of the bottom part of the basket 8, and arranged on an angular support 27 in proximity of a wall 152 of the cabinet 2. The motorised fan 18 is suitable to the intake of air through the inlets 21, to the circulation of the same air heated by the resistors 22 inside the basket 8, to the outlet of the air through the fore central part 24 of the cabinet 2. Said central part 24 is preferably provided with a filter 25 that is suitable to withhold possible filaments carried by the air that must get out of the basket 8.

**[0022]** The arrangement of the motor 15 on the angular support 13 and of the motorised fan 18 on the angular support 27 allows that distance DS between the upper end 170 of the washing tub 3 and the bottom end 171 of the drying basket 8 is minimum and certainly shorter than the distance between the bottom end 173 of the washing tub 3 and the bottom 150 of the cabinet 2, equal or shorter than 14 cm. The position of the angular sup-

ports 13, 27 on the same horizontal line of the end 171 of the basket 8 allows to reduce the distance DS that is substantially equal to 4 cm. In this way the laundry washer and dryer machine has a height lower than known machines.

**[0023]** The size of the basket 8 larger than that of the basket 4 and the particular arrangement of the counterweights 160 and 161 allows the bearing of the oscillations due to the centrifugal stage to which the basket 4 is subject.

**[0024]** With size of the basket 8 of 59 cm in diameter, of the basket 4 of 45 cm in diameter, of diameter of the washing tub 3 of approximately 50 cm, and with the weight of 13 Kg of the counterweights 160 and of Kg 15 of the counterweights 161, it is possible to reach a centrifugal speed of 1600 revolutions/minute, that is the speed such as to obtain the standard classification "A".

**[0025]** The height dimension H1 of 62,5 cm of the unit made up of the washing tub 3, the motor 14 and the counterweights 160, 161 and the height dimension H2 of 59, 5 cm of the unit made up of the drying basket 8, the motor 15 and the motorised fan 18 determines a total height H of cabinet 2 of 130 cm.

**[0026]** Two power supply lines L1 and L2 of the two devices 1 and 7 are provided that are connected with a single power supply line L connected with an external power network.

**[0027]** In the cabinet 2, in the central zone between the washing device 1 and the drying device 7 a panel 16 is housed containing the controls for the starting of the aforesaid devices.

**[0028]** Inside the cabinet 2 a control device 100 is also present that is suitable to manage said washing device 1 and said drying device 7, when they are both active, in order to maintain only one of them or both in function depending on whether the electric power consumption of both said devices is lower or higher than a predefined value. The control device 100, shown in Figure 3, comprises a first sensor S1 arranged in proximity of the power supply line L1 of the washing device 1 so as to detect the consumption of energy of the same device 1, and a second sensor S2 arranged in proximity of the power supply line L2 of the drying device 7 so as to detect the consumption of energy of the same device 7. An adder S provides to sum up the signals detected by the two sensors S1 and S2 and a signal A at the output of the adder S is then sent to a comparator COMP that is capable to compare said signal A with a reference signal B that is equivalent to the predefined electric power value. The latter can preferably be set by a user by operating on an appropriate knob C present in the control panel 16. If the value of the signal A is higher than the value of the signal B a signal E in output of the comparator controls the turning off of one of the devices 1 and 7. The device 1 or 7 to be turned off can be set from the outside by means of a button T, present in the control panel 15, that drives a commutator D located downstream of the comparator COMP and capable to com-

mute the signal E either onto a switch LA or onto a switch AS. Such switches AS and LA, located in the power supply lines L1 and L2, are generally close but get opened by means of the signal E.

**[0029]** In Figures 6-9 a laundry washer and dryer machine according to a second embodiment of the invention is shown that differs from the machine of the first embodiment in the different drying system of the condensing closed circuit type. Said system avails of a circuit 30 for the flow of warm air (heated by the resistors 22) by means of a motorised fan 31, a circuit 32 for the flow of cold air by means of a motorised fan 33, a heat exchanger 34 that is part of the circuit 30 and an expansion chamber 35 that is part of the circuit 32. The warm air of the circuit 30 passes through the basket 8 and gets charged with humidity because of the presence of the humid laundry and passes through the heat exchanger 34 located inside the expansion chamber 35. The cold air present in the circuit 32 passes on the outside of the warm air of the circuit 30 thus causing its condensation. The motor fans 31 and 33 are located on the angular support 27 of the cabinet 2 whereas the motor 15 for the operation of the basket 8 is positioned on the angular support 13.

**[0030]** The water droplets produced by the condensation can be collected by means of a system for the collection of the water (Figure 6) comprising a tray 40, arranged in a way adjacent to the bottom part of the basket 8 and in which the droplets of decalcified water are collected, and a pump 41 capable to send the water present in the tray 40 through a duct 43 into a collection tank 42.

**[0031]** The system for the collection of water comprises a duct 501 between the tub 42 and the detergent charging device 600 or 601; the flow of water is adjusted by means of a valve 500 activated by an external control. The decalcified water being collected allows a decrease in the consumption of water and a reduction in the consumption of detergent more effective with the decalcified water. The system for the collection of water comprises a sensor capable to signal if the quantity of water in the tub 3 reaches a predetermined level and in this case to activate the backflow of water to the tank 42 by means of the safety duct 503. In Figure 6 the ducts 501 and 503 are indicatively arranged outside of the cabinet 2 in order to better describe the aforesaid water collection system, however they must be normally considered as located inside the cabinet 2.

**[0032]** The tank 42 for the collection of the water and the heat exchanger 34 can be easily removed from their housings for their maintenance since they are arranged in proximity of the top 300 of the cabinet 2.

**[0033]** Preferably the heat exchanger 34 has a triangular shape for the easy location in an upper angular position in the cabinet 2 between the wall 151 and the top 300 of the cabinet 2.

**[0034]** As an alternative the water produced due to the condensation can be sent by means of transport means

50 towards the washing device 1 in which it is used for the various washing stages (Figure 7).

## 5 Claims

1. Laundry washer and dryer machine comprising a washing device (1) and a drying device (7) located inside a single cabinet (2) in which said drying device (7) is superimposed onto said washing device (1), said washing device (1) comprising a washing tub (3) inside which a first basket (4) is housed that is suitable to contain the laundry to be washed and said drying device (7) comprising a second basket (8) that is suitable to contain the laundry to be dried and at least one motorised fan (18; 31, 33) and resistors (22) for the circulation of warm air suitable to the drying of the laundry contained in basket (8), **characterised in that** it comprises two motors (14, 15) for the movement of said first (4) and second baskets (8), and **in that** the motor (15) for the movement of said second basket (8) and at least one motorised fan (18; 31, 33) are arranged on respective angular supports (13, 27) of the cabinet (2) in proximity of its side walls (151, 152) and on top of the washing tub (3) in such way that the distance (DS) between the top end (170) of said washing tub (3) and the bottom end (171) of said drying basket (8) is shorter than the distance between the bottom end (173) of the washing tub (3) and the bottom (150) of the cabinet (2).
2. Machine according to claim 1, **characterised in that** said distance (DS) between the top end (170) of said washing tub (3) and the bottom end (171) of said drying basket (8) is substantially of 4 cm.
3. Machine according to claim 1, **characterised in that** the motor (14) for the movement of the first basket (4) is located in proximity of the bottom (150) and of a side wall (151) of the cabinet (2) so as to form an angle ( $\alpha$ ) between the vertical axis (P) and the straight line connecting the centres of the washing tub (3) and the motor (14) for the movement of the first basket (4) is substantially of 27°.
4. Machine according to claim 1, **characterised in that** it comprises counterweights (160, 161) arranged in a way adjacent to the top (163) and bottom (164) part of the washing tub (3).
5. Machine according to claim 1, **characterised in that** it comprises a closed circuit condensation drying system, said system comprising a first circuit (30) for the flow of air heated by electric resistors (22) by means of a first motorised fan (31) capable to send it into said basket (8) of the drying device (7), a second circuit (32) for the flow of cold air by

means of a second motorised fan (33), a heat exchanger (34) that is part of the first circuit (30), that is suitable to receive the warm air that has gone through said basket (8) and located inside an expansion chamber (35), that is part of a second circuit (32), so as to cause the condensation of the warm air of the first circuit (30), said first (31) and second (33) motorised fan both being arranged on said angular supports (27).

6. Machine according to claim 5, **characterised in that** said heat exchanger (34) is located in proximity of the top (300) of the cabinet (2).

7. Machine according to claim 6, **characterised in that** said heat exchanger (34) has a triangular shape.

8. Machine according to claim 5, **characterised in that** it comprises means (40-43) for the collection of the condensation water, said means (40-43) comprising a tray (40) for the collection of the condensation water, a pump (41) suitable to send said water present in the tray (40) into a tank (42) located in the top part of the drying device (7) in proximity of the top (300) of the cabinet (2).

9. Machine according to claim 8, **characterised in that** it comprises means (501) for the flow of the water from the tank (42) towards a device for the loading of detergent (600, 601) of said washing device (1) and means (500) suitable to adjust said flow.

10. Machine according to claim 9, **characterised in that** it comprises means (503) for the backflow of the water into the tank (42) when a prefixed level of quantity of liquid is reached in the washing tub (3).

11. Machine according to claim 5, **characterised in that** it comprises means (50) for the transport of the condensation water into said washing device (1).

12. Machine according to claim 1, **characterised in that** it comprises a control device (100) that is suitable to manage said washing device (1) and said drying device (7) when they are both active, in such a way so as to keep in function only one or both of them depending on whether the electric power consumption of both said devices (1, 7) is lower or higher than a predefined value (B).

13. Machine according to claim 12, in which two power supply lines (L1, L2) are provided for said washing device (1) and said drying device (7), **characterised in that** said control device (100) comprises means (S1, S2) suitable to detect the electric power consumption of said washing device (1) and of said

drying device (7), an adder (S) of the signal in output of said means (S1, S2), a comparator (COMP) that is suitable to compare the value of the signal ( $\alpha$ ) in output of the adder (S) with said predefined value of electric power (B) switches (LA, AS) generally closed and located in said two power supply lines (L1, L2), one of said switches (LA, AS) being capable to be opened by means of a signal (E) in output of said comparator (COMP) if the value of the signal ( $\alpha$ ) in output of the adder (S) is higher than said predefined electric power value (B).

14. Machine according to claim 13, **characterised in that** it provides means (C) for setting said predefined electric power value (B).

15. Machine according to claim 13, **characterised in that** it provides means (T, D) suitable to select said switch on which said signal (E) in output of the comparator (COMP) must operate.

16. Machine according to claim 1, **characterised in that** it comprises counterweights (160, 161) arranged in a way adjacent to the top (163) and bottom (164) part of the washing tub (3) substantially of 13Kg and 15Kg, and **in that** said second basket (8) has a diameter of substantially 59 cm and said first basket (4) has a diameter of substantially 45 cm so as to allow a centrifugal speed of 1600 revolutions/minute, that is the speed needed to obtain the standard classification "A".

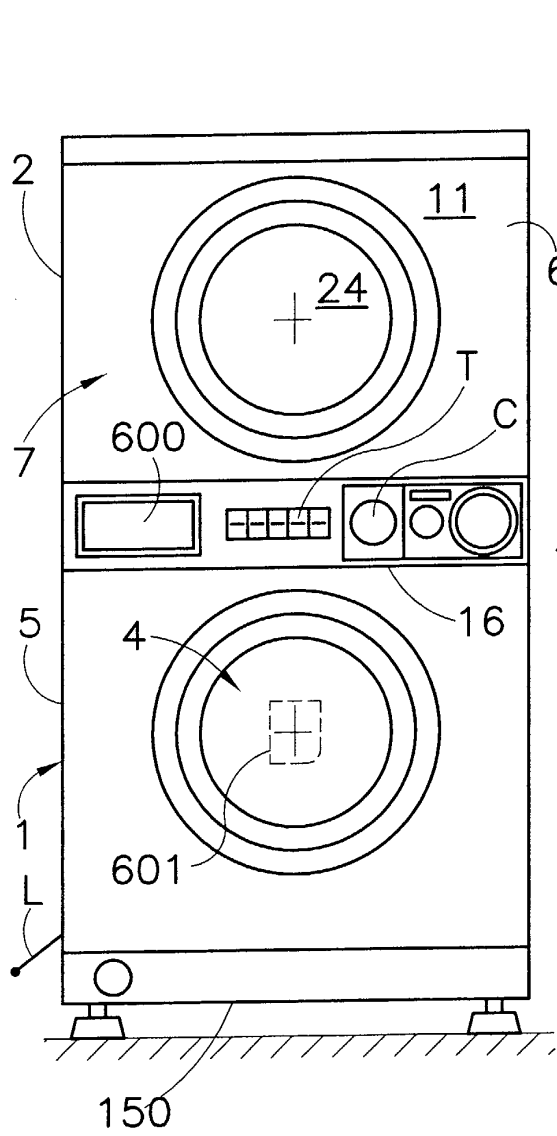


FIG. 1

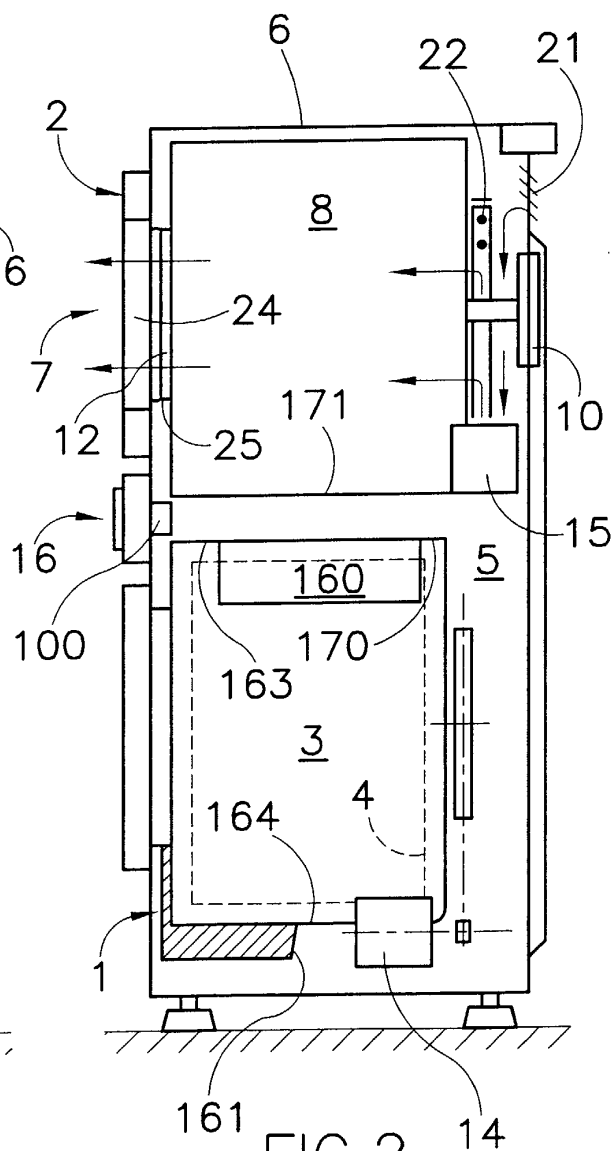


FIG. 2

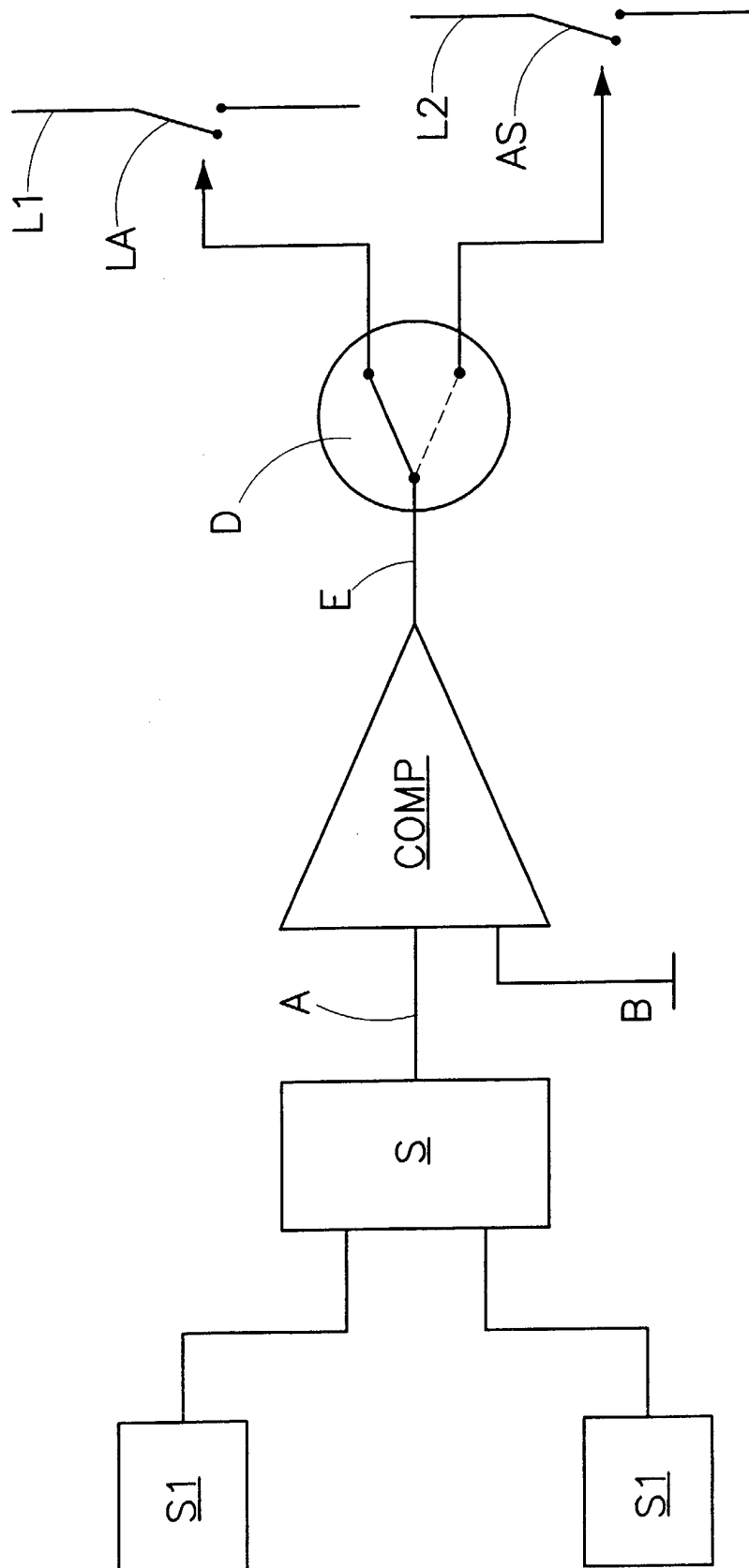


FIG. 3

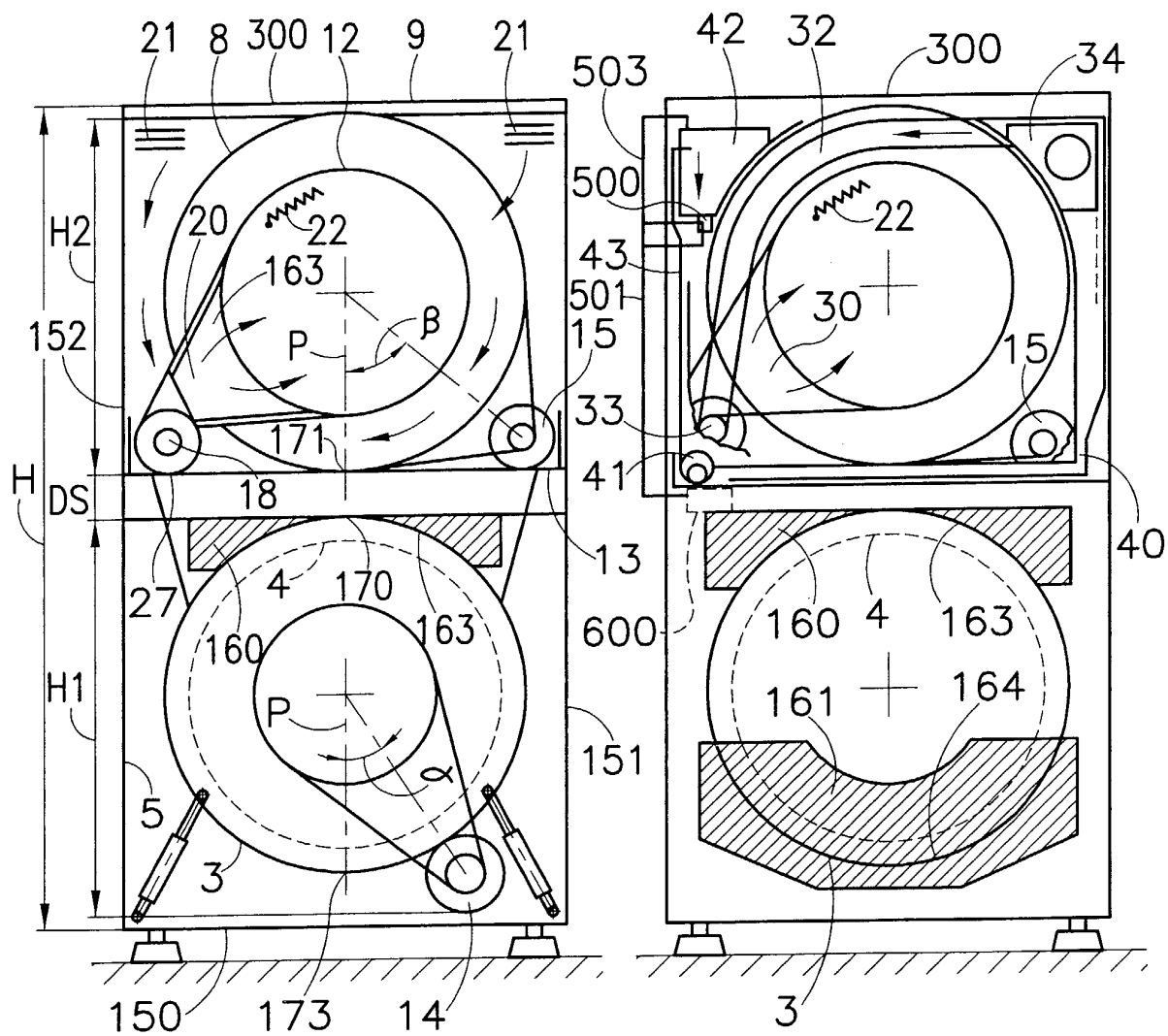
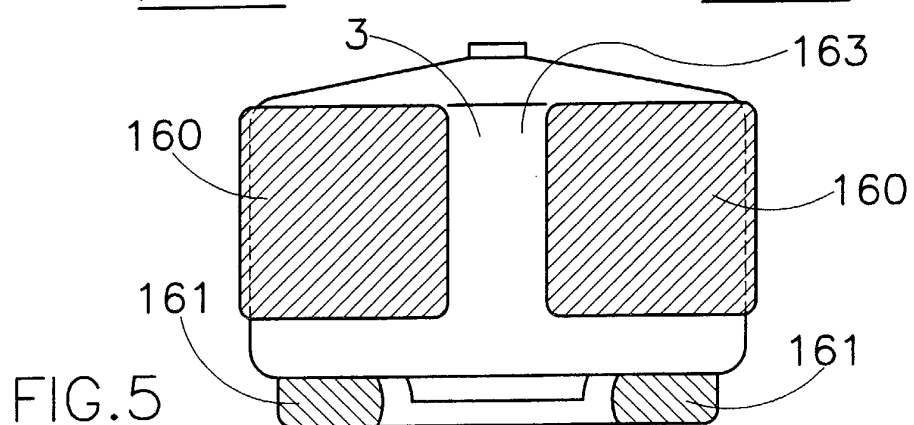


FIG. 4

FIG.6



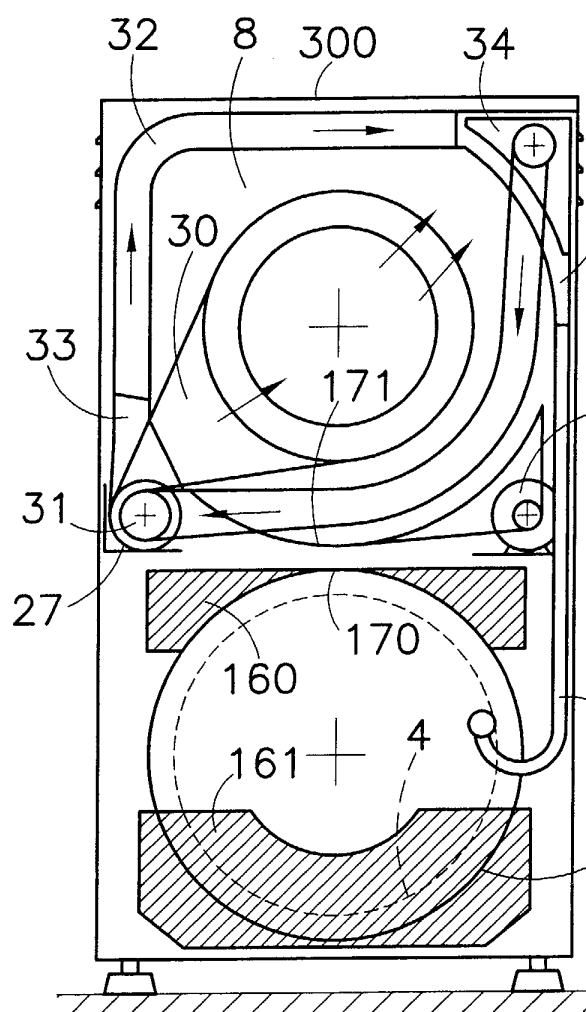


FIG. 7

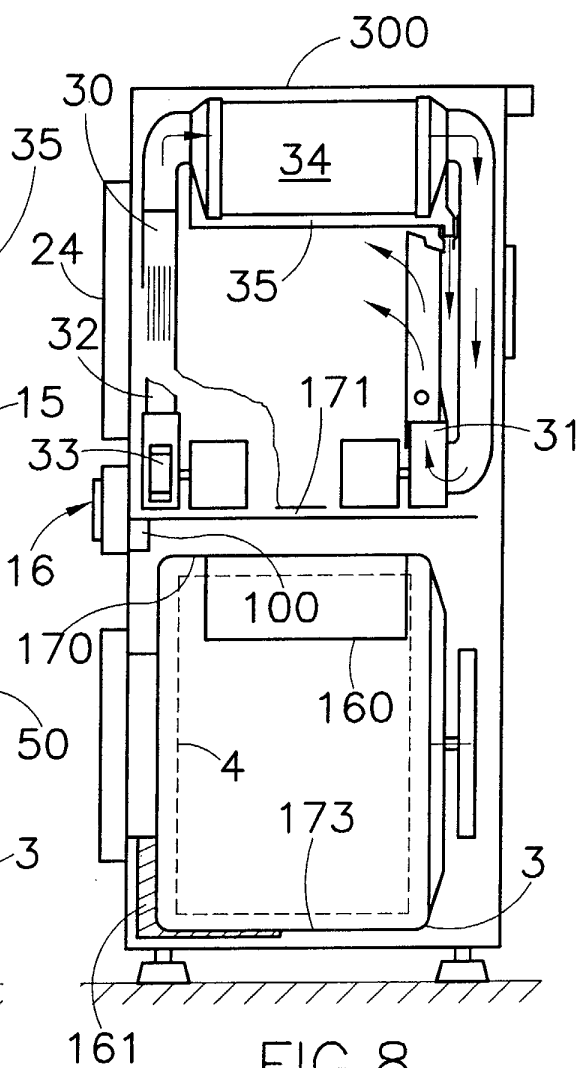


FIG. 8

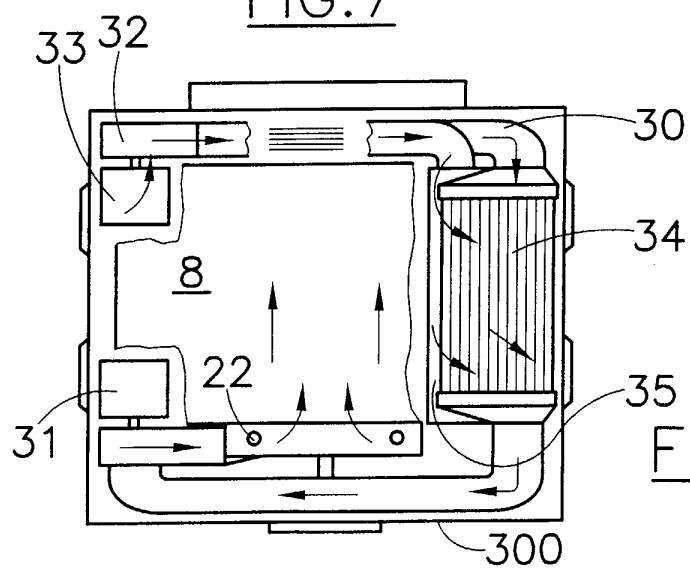


FIG. 9



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 03 07 6666

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                  |                                                   |                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document with indication, where appropriate, of relevant passages                                                                                                                                    | Relevant to claim                                 | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EP 0 747 523 A (MIELE & CIE)<br>11 December 1996 (1996-12-11)<br>* the whole document *                                                                                                                          | 1-3                                               | D06F29/00                                    |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ---                                                                                                                                                                                                              | 4-16                                              |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DE 11 86 413 B (BOSCH GMBH ROBERT)<br>28 January 1965 (1965-01-28)<br>* column 1, line 40 - column 2, line 28 *<br>* figure 1 *                                                                                  | 4,16                                              |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ---                                                                                                                                                                                                              | 5-7                                               |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EP 0 324 649 A (CREDA LTD)<br>19 July 1989 (1989-07-19)<br>* column 1, line 19 - line 37 *<br>* claims 1-3; figure 1 *                                                                                           | 8-11                                              |                                              |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ---                                                                                                                                                                                                              | 12-15                                             | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.7)      |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | DE 40 23 846 A (LICENTIA GMBH)<br>16 April 1992 (1992-04-16)<br>* column 1, line 3 - line 25 *<br>* claims 1-4 *                                                                                                 |                                                   | D06F                                         |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ---                                                                                                                                                                                                              | 1-16                                              |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GB 817 788 A (WESTINGHOUSE ELECTRIC INT<br>CO) 6 August 1959 (1959-08-06)<br>* page 1, line 39 - line 68 *<br>* page 2, line 3 - line 80 *<br>* page 3, line 72 - line 80 *<br>* claims 1,2; figure 2 *<br>----- |                                                   |                                              |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                  |                                                   |                                              |
| Place of search<br>MUNICH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                  | Date of completion of the search<br>1 August 2003 | Examiner<br>Weinberg, E                      |
| <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> |                                                                                                                                                                                                                  |                                                   |                                              |

EPO FORM 1503 03.82 (P04C01)

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

EP 03 07 6666

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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-08-2003

| Patent document<br>cited in search report |   | Publication<br>date |      | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---|---------------------|------|----------------------------|---------------------|
| EP 0747523                                | A | 11-12-1996          | DE   | 59601750 D1                | 02-06-1999          |
|                                           |   |                     | EP   | 0747523 A1                 | 11-12-1996          |
| DE 1186413                                | B | 28-01-1965          | AT   | 242652 B                   | 27-09-1965          |
| EP 0324649                                | A | 19-07-1989          | GB   | 2214279 A                  | 31-08-1989          |
|                                           |   |                     | DE   | 68902744 D1                | 15-10-1992          |
|                                           |   |                     | DE   | 68902744 T2                | 07-01-1993          |
|                                           |   |                     | EP   | 0324649 A1                 | 19-07-1989          |
| EP 1029961                                | A | 23-08-2000          | IT   | MI990304 A1                | 16-08-2000          |
|                                           |   |                     | EP   | 1029961 A2                 | 23-08-2000          |
|                                           |   |                     | TR   | 9903165 A2                 | 21-09-2000          |
| DE 4023846                                | A | 16-04-1992          | DE   | 4124650 A1                 | 28-01-1993          |
|                                           |   |                     | DE   | 4023846 A1                 | 16-04-1992          |
| GB 817788                                 | A | 06-08-1959          | NONE |                            |                     |