



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.01.2012 Bulletin 2012/04

(51) Int Cl.:
D06F 35/00 ^(2006.01) **D06F 39/02** ^(2006.01)
D06F 58/24 ^(2006.01)

(21) Application number: **11186088.8**

(22) Date of filing: **16.12.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

- **Bombardieri, Giovanni**
I-24021 Albino (BG) (IT)
- **Funari, Mariano**
I-63045 Force (AP) (IT)
- **Armonaviciute, Egle**
I-61043 Cagli (PU) (IT)

(30) Priority: **23.12.2008 IT TO20080975**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
09799163.2 / 2 389 469

(74) Representative: **Dini, Roberto et al**
Metroconsult S.r.l.
Via Sestriere 100
10060 None (TO) (IT)

(71) Applicant: **Indesit Company S.p.A.**
60044 Fabriano (AN) (IT)

Remarks:

This application was filed on 21-10-2011 as a divisional application to the application mentioned under INID code 62.

(72) Inventors:
• **Dottori, Mariangiola**
I-60043 Cerreto D'Esi (AN) (IT)

(54) **Scent agent dispenser for scenting laundry in a laundry treating machine**

(57) The present invention relates to a scent agent dispenser (1) adapted to be placed into a rotary drum (11) of a machine (10,10') for treating laundry (20), in particular a washing or washing/drying machine, said dispenser comprising a casing which defines a cavity that houses at least one absorbing element (4) adapted to be imbibed with a liquid scent agent, and comprising one or more holes (5) in the casing through which the scent agent is put in contact with the outside of the cavity, thus delivering the scent agent, wherein said casing is made of polypropylene loaded with calcium carbonate in a variable percentage in weight between 30% and 50%, in particular of 40%, and wherein the absorbing element (4) is made of foam polyurethane or sponge, so that the dispenser (1) can be used in a drum of a washing or washing/drying machine (10,10') during a step of treating laundry (20) by means of steam (20).

The present invention further relates to a kit and a combination comprising such a dispenser and a washing or washing/drying machine.

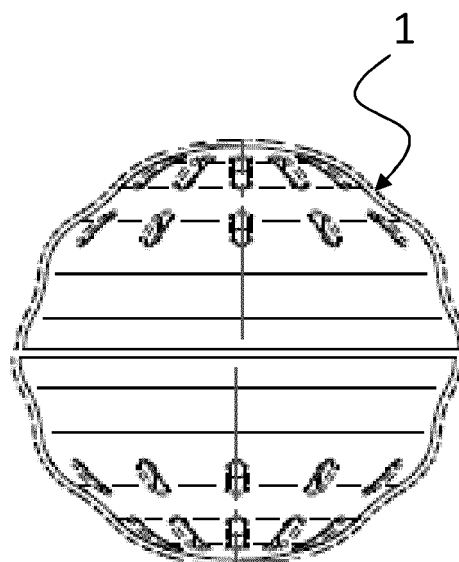


Fig.1

Description

[0001] The present invention relates to a scent agent dispenser for scenting laundry in a laundry treating machine according to the preamble of claim 1.

[0002] Laundry treating machines are, in general, washing machines, washing/drying machines or clothes dryers.

[0003] For the purposes of the present description, the term "scenting" will mean giving the laundry a certain scent or fragrance.

[0004] Several methods are known in the art for scenting articles of clothing in a clothes dryer; one of these is described in British patent application GB 2 302 553 in the name of RECKITT & COLMAN Inc., wherein the laundry is scented as follows: the laundry is placed into a bag together with a scent agent dispenser and is then loaded into the clothes dryer, where it is subjected to a stirring action by the turning drum and is blown with dry air at low temperature.

[0005] The presence of the bag in which both the laundry and the dispenser are placed is apparently due to the necessity of not dispersing the scent agent into the air circulating within the machine, thus allowing it to be fixed more easily onto the clothes, which remain in closer contact with the dispenser: in support of this thesis, in fact, according to a preferred solution the bag is impermeable, so that the scent agent is delivered onto the clothes by the air.

[0006] This method is time-consuming, since it requires the user to remove the laundry and place it into the bag, add the dispenser, close the bag and load it into the clothes dryer, which must include an operating program that blows air at low temperature.

[0007] In this respect, first of all it is not conceivable to do without the bag, since this would imply a lower degree of fixing of the perfume onto the clothes, sometimes resulting in inappropriate treatments.

[0008] Secondly, this method is not feasible when the machine in use, unlike a clothes dryer or a washing/drying machine, lacks a drying function: for example, a simple washing machine cannot blow air onto the laundry, and cannot therefore be used for implementing such a method.

[0009] The present invention aims at providing a method for scenting clothes in a laundry treating machine which overcomes the above-mentioned drawbacks.

[0010] The present invention is based on the idea of providing a method for scenting laundry placed inside a rotary drum of a laundry treating machine which comprises the step of delivering the scent agent onto the laundry by means of steam.

[0011] This object is achieved by putting into the machine drum, together with the laundry and without using any bag, a scent agent dispenser that releases scent agent to scent the clothes.

[0012] Many are the advantages deriving from delivering the scent agent onto the laundry by means of steam:

first and foremost, the scent agent penetrates more deeply into the fabrics, thereby ensuring a longer lasting and more homogeneous scenting of the latter. Furthermore, by using steam at a temperature higher than the ambient temperature, the laundry and the dispenser no longer need to be contained in a common bag; instead, they can be simply loaded into the drum, ready for treatment.

[0013] Another advantage is given by the fact that the method can be implemented on both washing and washing/drying machines, provided that they are capable of generating steam to be delivered onto the laundry.

[0014] These machines are per se known; some current models even include a "refresh cycle" wherein the laundry is placed dry into the drum and is subjected to the action of steam, so as to eliminate any bad smell from the clothes, such as cigarette smoke or the like, thus providing a real smell removal action by means of steam.

[0015] The "refresh" cycle also relaxes the fabric fibres and makes them become softer to the touch.

[0016] For the purposes of the present invention, the term "dry laundry" refers to laundry having a humidity content approximately equal to that of the environment, i.e. not imbibed with water.

[0017] During said refresh cycle, the laundry is not imbibed with water, since it is only subjected to the action of steam, and is then removed only slightly damp from the washing or washing/drying machine.

[0018] In accordance with the teachings of the present invention, a washing or washing/drying machine of the type capable of generating steam can also be used for scenting the laundry.

[0019] It is another object of the present invention to provide a scent agent dispenser according to claim 8.

[0020] The present invention also relates to a kit as per claim 9.

[0021] It is a further object of the present invention to provide a combination of a washing or washing/drying machine and a scent agent dispenser as per claim 10.

[0022] Further advantageous features of the present invention will be set out in the appended claims, which are intended as an integral part of the present description.

[0023] These features as well as further advantages will become more apparent from the following description of an embodiment thereof as shown in the annexed drawings, which are supplied by way of non-limiting example, wherein:

Fig. 1 shows a scent agent dispenser according to the present invention;

Fig. 2 is an exploded view of the dispenser of Fig. 1;

Fig. 3 is a top view of the dispenser of Fig. 1;

Fig. 4 shows a step of the method applied to a washing machine, wherein the steam is produced inside the tub;

Fig. 5 shows a step of the method applied to a different type of washing machine, wherein the steam is produced in a boiler;

Fig. 6 shows a time/temperature graph relating to a

laundry scenting cycle in accordance with the method of the present invention.

[0024] The method of the present invention requires that laundry 20 be placed dry into rotary drum 11 of a washing or washing/drying machine 10, as shown in Figs. 4 and 5.

[0025] In addition to laundry 20, a scent agent dispenser 1 is also placed into drum 11, which dispenser can move freely in drum 11 together with laundry 20.

[0026] Figs. 1, 2 and 3 show dispenser 1, which in the example provided comprises an outer casing that defines a cavity that houses an absorbing element 4 adapted to be imbibed with a liquid scent agent.

[0027] In the illustrated example, the casing consists of two half-shells 2 and 3 which can be coupled to each other through a threaded connection, i.e. male thread 30 visible on half-shell 3 engages into a matching female thread present (but not shown) on opposite half-shell 2.

[0028] It is worth mentioning that the coupling between the two half-shell 2 and 3 may alternatively be obtained through interference fit, snap-on or click engagement, or suitable geometric profiles which are per se known and will not therefore be described any further.

[0029] The material of the two half-shells 2 and 3 will be tackled later on; for now, suffice it to say that they have multiple holes 5 which put the inside of the cavity that houses absorbing element 4 in communication with the outside of dispenser 1.

[0030] Absorbing element 4 is imbibed with a scent agent such as a liquid scented fragrance, e.g. an alcohol-based or non-alcoholic human perfume.

[0031] Dispenser 1 placed inside the drum is subjected, together with laundry 20, to a stirring action caused by the rotation of drum 11.

[0032] Steam is then produced in machine 10, 10' as shown schematically in Figs. 4 and 5 by the cloudlets designated 15, which steam heats laundry 20 to a certain temperature and contributes to diffusing and fixing the scent agent onto laundry 20.

[0033] The production of steam is ensured by a steam generator, which may be provided in different ways: for example, Fig. 4 schematically shows a washing machine 10 wherein steam is produced by heating a resistor 16 arranged in tub 12 that houses drum 11, which resistor is usually used for heating the wash liquid during the wash steps, as described for example in patent application EP 1 275 767 by V-ZUG.

[0034] Fig. 5 shows a different solution, wherein the steam generator is a boiler 16' housed outside tub 12 and in communication with the latter.

[0035] In any case, independently of which steam generator 16 or 16' is chosen, it must be pointed out that laundry 20 and dispenser 1 are both subjected to both the steam action and the rotation caused by moving drum 11, which is kept turning at a speed slower than the so-called "satellization" speed, i.e. that speed at which the laundry adheres to the drum walls through the effect of

centrifugal force; in this regard, the useful drum rotation speeds range between 40 and 70 revolutions per minute, in particular 55 revolution per minute.

[0036] The use of a speed slower than the satellization speed implies that the clothes are continually stirred by rolling onto one another on the drum bottom, thus generating a condition wherein, with the help of steam and of dispenser 1, the laundry is scented and the fabrics are relaxed.

[0037] The synergic action of the low-speed rotation of the drum and of steam 15, in fact, causes the scent agent contained in dispenser 1 to be fixed to laundry 1 evenly (mainly because of rotation) and deeply in the fabric fibres (mainly because of steam), thus providing a durable and uniform scenting of the laundry without incurring in the drawbacks of the method according to the prior art.

[0038] A detailed example of a laundry scenting cycle according to the present invention is shown in Fig. 6: the axis of abscissas indicates the time expressed in minutes [min], while the axis of ordinates indicates the temperature expressed in Celsius degrees [°C]; the function shown corresponds to the temperature detected by a temperature sensor located in the proximity of the tub, typically a temperature probe comprising a negative temperature coefficient (NTC) thermistor, which measures the temperature of the water around the resistor.

[0039] The temperature probe may, for example, be secured to the resistor support.

[0040] Observing the graph of Fig. 6, it can be noticed that the time intervals on the axis of abscissas are not strictly accurate but merely exemplificative, aiming at making the graph more easily readable.

[0041] The cycle example provided has a total duration of 20 minutes and is supposed to be carried out by a machine 10 like the one described with reference to Fig. 4, the specifications of which should be taken into account.

[0042] The cycle starts with water being supplied into the tub for about 2 minutes, until it exceeds the resistor level while still remaining below the drum, so as not to wet laundry 20 previously loaded by the user together with dispenser 1; during this step, the temperature detected is approximately 15 °C.

[0043] Subsequently, when water supply is complete, i.e. at about minute two, the drum starts to rotate at a speed of about 55 revolutions per minute, which speed is kept constant throughout the cycle without reversing the direction of rotation.

[0044] At minute two electric resistor 16 is activated for about one minute, so that the detected temperature increases to a value of about 40 °C.

[0045] The electric resistor is then turned off for two minutes, which causes the temperature drop indicated in Fig. 6 between minutes three and five.

[0046] During the pause period, the temperature probe takes a reading of the temperature value. If this value is equal to or greater than a first threshold value (said

threshold value being predetermined and set to about 45 °C, for example), that will be an indication that resistor 16 is at least partially emerged.

[0047] In such a case, the method provides for supplying a predetermined quantity of water into the tub (by opening for a corresponding preset time the solenoid valve that connects the machine 10, 10' to the water mains), as necessary to submerge electric resistor 16 again without however wetting drum 11.

[0048] No water will be supplied into the tub if the temperature reading is lower than said first threshold value.

[0049] At minute five, the electric resistor is turned on again for a minute, i.e. until minute six, when the detected temperature should be about 50 °C.

[0050] Subsequently, from minute six to minute eight, i.e. for two minutes, there is a repetition of the step of turning off the resistor and measuring the temperature variation in order to verify if the resistor has remained at least partially emerged (in which case the comparison is made between the measured temperature value and a second threshold value, said second threshold value being predetermined and set to about 55 °C; again, if said second threshold value is reached or exceeded by the measured temperature value, a predetermined quantity of water will be supplied into the tub).

[0051] The resistor is then turned on again for one minute, until the temperature increases to about 60 °C at minute nine.

[0052] The resistor is then turned off again for two minutes, until minute eleven, in order to verify the operating parameters of the machine as described above for the previous deactivations (in this case, the comparison is made between the measured temperature value and a third threshold value, said third threshold value being predetermined and set to about 65 °C; again, if said third threshold value is reached or exceeded by the measured temperature value, a predetermined quantity of water will be supplied into the tub).

[0053] At minute eleven, the resistor is turned on again for two minutes, so that the water temperature increases to about 86 °C, at which point the quantity of steam produced will be sufficient for the treatment.

[0054] The treatment will then go on for about seven minutes, during which the resistor will be turned on and off several times in order to keep the temperature in the range of approximately 80 °C to 90 °C, in particular 84 °C to 86 °C.

[0055] The graph shows a total time of about twenty minutes; if the machine is not fully loaded, however, the total time may be shorter than that, e.g. 16-17 minutes.

[0056] Of course, the final temperature of about 84 °C - 86 °C may also be achieved, for example, through a different number of steps of successive resistor activations and deactivations, e.g. one, two, three, four, five or more steps as necessary, without however departing from the teachings and scope of the present invention.

[0057] When the refresh treatment is over, the scented fragrance will have been removed from absorbing ele-

ment 4, and it will be possible to choose another fragrance for the next treatment without the risk that different scents are mixed together.

[0058] Referring back to dispenser 1, it must be pointed out that it is preferably made of materials which allow it to be used at high temperatures and in a very damp environment, such as the drum of machine 10, 10' when steam is produced.

[0059] A particularly advantageous dispenser 1, for example, is made of polypropylene loaded with calcium carbonate in a percentage in weight between 30% and 50%, preferably of 40%.

[0060] As far as the absorbing element is concerned 4, it is preferably made of foam polyurethane or sponge, which offer the advantageous characteristics of leaving the fragrance of the scent agent unchanged and of withstanding the temperatures and action of steam during the above-described cycle.

[0061] It is worth mentioning that, although dispenser 1 is shown in the drawings as some sort of sphere, it may likewise have different geometrical shapes, e.g. star, triangle, polyhedron or whatever, provided that it has an inner cavity for accommodating absorbing element 4 imbibed with the selected scent agent.

[0062] In this regard, it should be pointed out that the scent agent may even be a normal human alcohol-based perfume, in which case the effects of its application by means of steam would be even stronger: the evaporation temperature of an alcohol-based perfume is normally lower than that of water, and therefore it is absolutely certain that the perfume will evaporate completely when delivered by means of steam, thus being fixed evenly and deeply to the laundry.

[0063] In this respect, assuming that machine 10, 10' is used for scenting clothes by both a man and a woman, it is conceivable to provide a kit comprising a machine 10, 10' and two different dispensers recognisable by their colour or shape, so that each user can avoid using the other user's dispenser in order not to scent the man's clothing with a typically female perfume and vice versa.

Claims

1. Scent agent dispenser (1) adapted to be placed into a rotary drum (11) of a machine (10,10') for treating laundry (20), in particular a washing or washing/drying machine, said dispenser comprising a casing which defines a cavity that houses at least one absorbing element (4) adapted to be imbibed with a liquid scent agent, and comprising one or more holes (5) in the casing through which the scent agent is put in contact with the outside of the cavity, thus delivering the scent agent,
characterized in that
said casing is made of polypropylene loaded with calcium carbonate in a variable percentage in weight between 30% and 50%, in particular of 40%, and

wherein the absorbing element (4) is made of foam polyurethane or sponge, so that the dispenser (1) can be used in a drum of a washing or washing/drying machine (10,10') during a step of treating laundry (20) by means of steam (20).

5

2. A kit comprising: a washing or washing/drying machine (10,10') of the type that comprises a drum (11) into which laundry is placed (20), which can produce steam and deliver it onto the laundry (20), **characterized in that** it also comprises at least two scent agent dispensers, each comprising a casing made of polypropylene loaded with calcium carbonate in a variable percentage in weight between 30% and 50%, in particular of 40%, wherein the casing defines a cavity that houses an absorbing element (4) made of foam polyurethane or sponge adapted to be imbibed with a liquid scent agent, and wherein the two dispensers are different from each other so as to be recognizable.
3. A combination of a washing or washing/drying machine (10,10') and a scent agent dispenser (1), said machine (10,10') being of the type equipped with a tub that houses a drum (11) into which laundry can be placed (20), said machine being adapted to produce steam and deliver it onto the laundry (20), and said scent agent dispenser (1) comprising a casing made of polypropylene loaded with calcium carbonate in a variable percentage in weight between 30% and 50%, in particular of 40%, wherein the casing defines a cavity that houses an absorbing element (4) made of foam polyurethane or sponge adapted to be imbibed with a liquid scent agent.

10

15

20

25

30

35

40

45

50

55

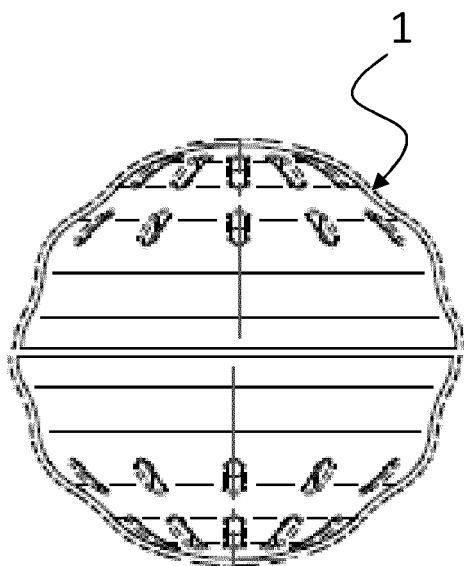


Fig.1

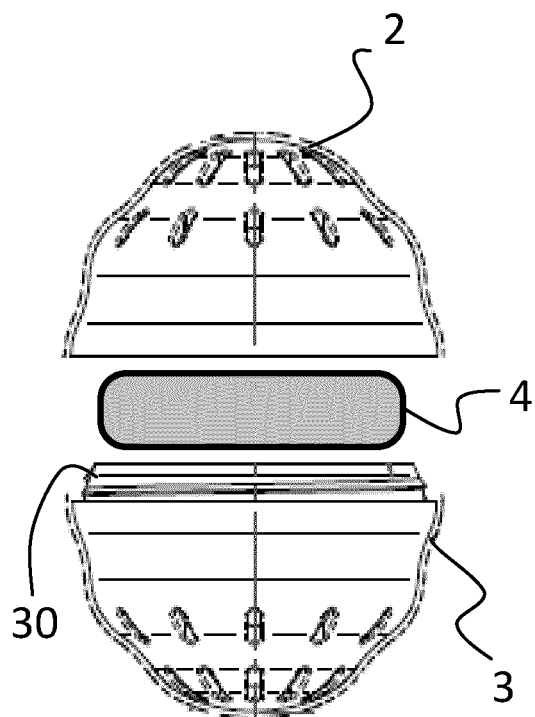


Fig.2

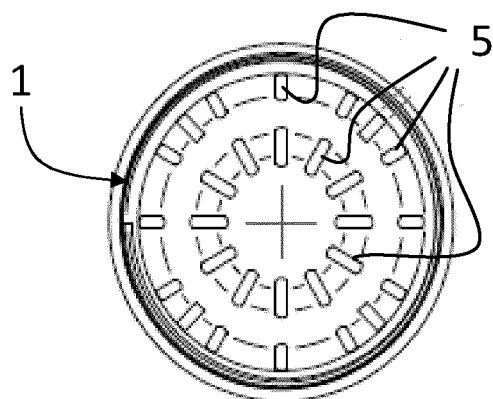


Fig.3

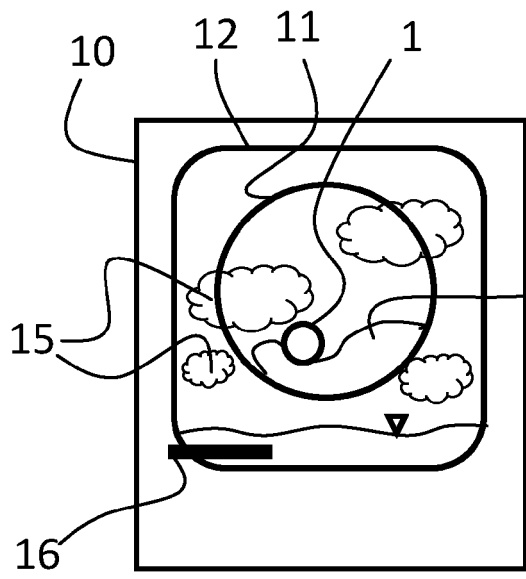


Fig. 4

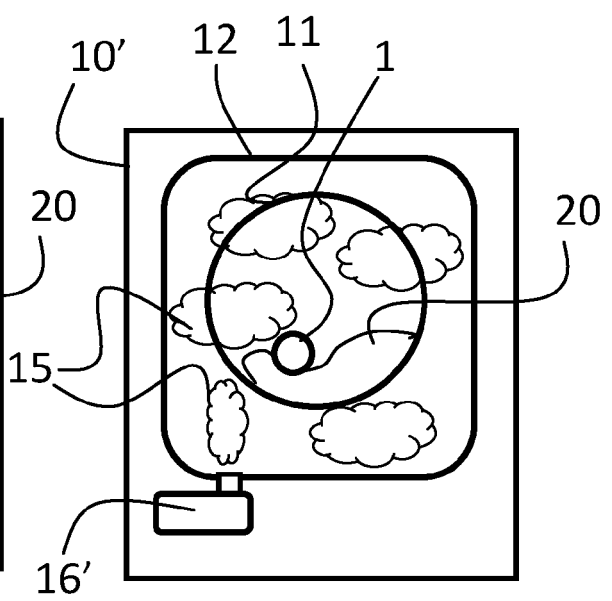


Fig. 5

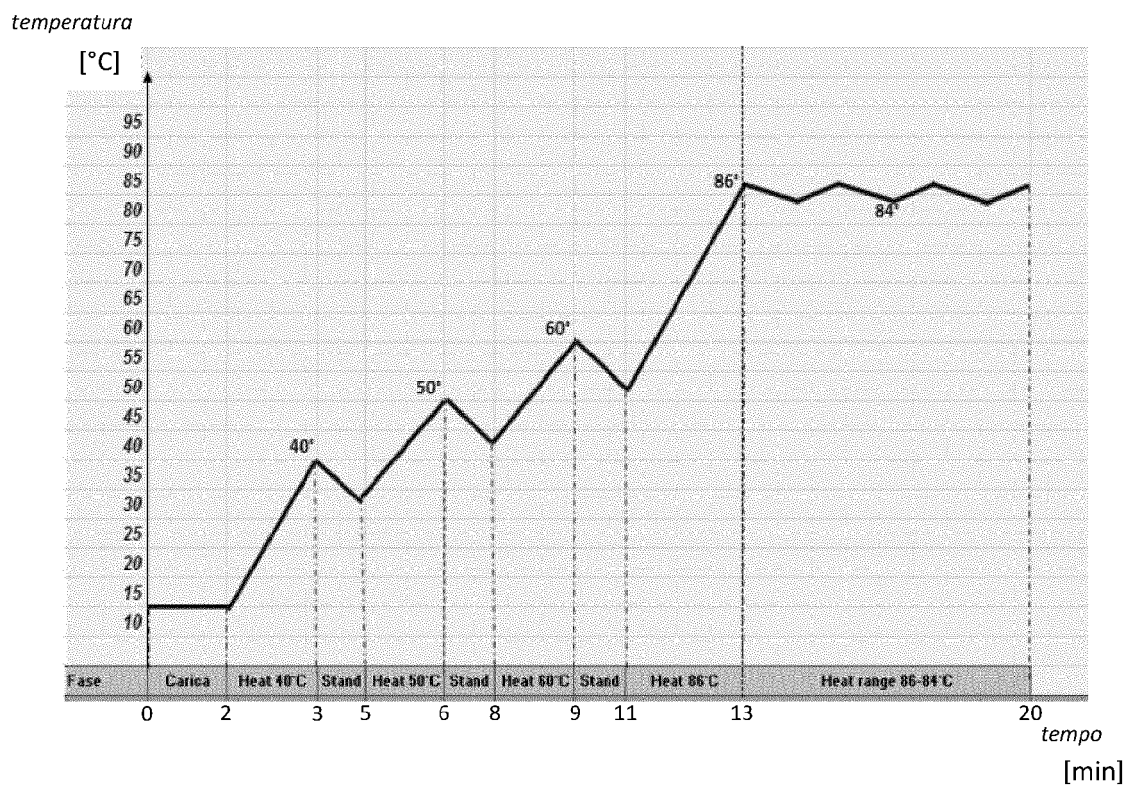


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 6088

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2005/148479 A1 (BARTHEL WOLFGANG [DE] ET AL) 7 July 2005 (2005-07-07) * paragraph [0002] * * paragraph [0126] - paragraph [0128]; figure 3 *	1-3	INV. D06F35/00 D06F39/02 D06F58/24
A	EP 0 398 478 A1 (STUART SHELDON BOWIE [US]) 22 November 1990 (1990-11-22) * page 23, line 3 - page 23, line 12; figures 1-3 *	1-3	
A	GB 2 232 422 A (SANYO ELECTRIC CO [JP]) 12 December 1990 (1990-12-12) * page 4, line 12 - page 4, line 21; figures 1,6-10 *	1-3	
A	WO 00/72741 A1 (ELECTROLUX ZANUSSI ELETTRODOME [IT]; DURAZZANI PIERO [IT]) 7 December 2000 (2000-12-07) * page 4, line 19 - page 4, line 31; figure 1 *	1-3	
A	US 2004/241195 A1 (TOLLENS FERNANDO RAY [US]) 2 December 2004 (2004-12-02) * paragraph [0002] * * paragraph [0017]; figure 3 *	1-3	D06F A47L A61K
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 November 2011	Examiner Fachin, Fabiano
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 D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

 1
EPO FORM 1503 03.82 (P04C01)

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

EP 11 18 6088

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.

17-11-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005148479 A1	07-07-2005	NONE	
EP 0398478 A1	22-11-1990	EP 0398478 A1	22-11-1990
		US 5176275 A	05-01-1993
GB 2232422 A	12-12-1990	AU 627572 B2	27-08-1992
		AU 5452990 A	03-01-1991
		CA 2015503 A1	08-12-1990
		CN 1048904 A	30-01-1991
		GB 2232422 A	12-12-1990
		US 5056341 A	15-10-1991
WO 0072741 A1	07-12-2000	AU 754860 B2	28-11-2002
		AU 4552300 A	18-12-2000
		DE 60003687 D1	07-08-2003
		DE 60003687 T2	03-06-2004
		EP 1189534 A1	27-03-2002
		ES 2202120 T3	01-04-2004
		IT PN990043 A1	01-12-2000
		JP 2003500145 A	07-01-2003
		NZ 513995 A	28-09-2001
		US 6622740 B1	23-09-2003
		WO 0072741 A1	07-12-2000
US 2004241195 A1	02-12-2004	CA 2526219 A1	09-12-2004
		CN 1798582 A	05-07-2006
		EP 1626743 A1	22-02-2006
		JP 2007526343 A	13-09-2007
		KR 20060017828 A	27-02-2006
		MX PA05012833 A	13-02-2006
		US 2004241195 A1	02-12-2004
		WO 2004105811 A1	09-12-2004

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 2302553 A [0004]
- EP 1275767 A [0033]