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(71) Applicant: **Union Planseca, S. L.**
30700 Torre-Pacheco, Murcia (ES)

(72) Inventor: **MARTINEZ MORENO, Julio, Fernando**
28045 Madrid (ES)

(74) Representative: **Carpintero Lopez, Francisco et al**
Herrero & Asociados, S.L.
Alcalá 35
28014 Madrid (ES)

(54) CLOTHES DRYER/PRESS

(57) The invention relates to a clothes dryer-press formed from a body (1) containing the clothes, provided with a front access door (3) for accessing the inside and ending at the top in a grated dome (7) in which there is arranged a plurality of turbines (9) with their corresponding electric heating resistance elements, such that said turbines (9) send hot air into the body (1) where the clothes (6) are hanging with the aid of hangers (5) and a transverse rod (4), such that the air coming in through the gratings (8) of the dome (7) acts on the hanging clothes (6), causing them to dry, and exits to the exterior through side conduits (11), specifically through the rear grating (13). To aid with the pressing there are straightening means for the clothes formed by elastic bands which straighten different areas of the clothes from the lower area thereof, or weights are arranged, suitably distributed among the clothes.

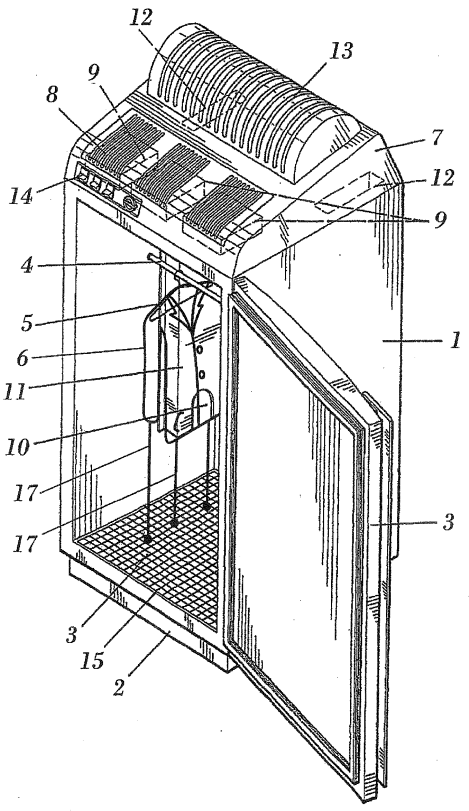

FIG. 2

EP 2 322 707 A1

Description

Object of the Invention

[0001] The present invention relates to an apparatus which has been particularly designed for drying clothes, at the same time achieving a high level of "pressing" for said clothes obviously after they are washed, and which carries out its function by providing hot air to an enclosure defined by the machine itself which is closed off and thermally insulated from the exterior, in which enclosure the clothes are placed hanging on suitable hangers in order to achieve the complementary pressing effect and in which the clothes are kept straightened by incorporating clothes tensing means.

Background of the Invention

[0002] On many occasions both on an industrial and domestic level, when garments are washed it is difficult to dry them because there is no suitable place available or desired environment so that the clothes can dry on their own in relatively short time periods and in suitable conditions.

[0003] Drying machines are known for solving this problem which, having an appearance similar to that of a conventional washing machine and also provided with tumbling means for the clothes, such as a rotating drum for example, supply the same hot air to bring about their quick drying.

[0004] Although these machines carry out their function as dryers in a fully satisfactory manner, they have the drawback and fundamental problem of the clothes being completely wrinkled after drying, which makes it necessary to perform the considerable task of pressing them later.

Description of the Invention

[0005] The clothes dryer-press proposed by the invention solves in a fully satisfactory manner the drawbacks set forth above such that by allowing a quick and effective drying of the clothes, at the end of said drying said clothes are pressed, virtually in conditions for use or, in the worst case scenario, with a need for a very light pressing in the event of the garment being 100% cotton.

[0006] To that end and more specifically, the dryer-press proposed by the invention is formed from a basically prismatic-rectangular body, without ruling out any other geometric configuration suitable, provided with a front exterior access door and thermally insulated along its entire perimeter, inside which and at a higher level there is arranged a transverse rod for hanging hangers from which the clothes to be dried will logically be suspended, said body ending at the top in grated dome under which there are arranged several turbines provided with respective electric heating resistance elements and by respective thermostats, such that in the event of possible overheating in one of said turbines due to any electromechanical failure, such turbine is automatically stopped, the rest remaining in operation.

[0007] These turbines introduce hot air into the body, duly oriented towards the clothes hanging from the hangers, and the humid air leaves the body through internal side conduits which, collecting the air from the lower area of the body, channel it towards the upper grated dome, preferably behind the area for the access of environmental air into the turbines.

[0008] A control device allows starting and stopping the dryer-press, as well as programming both the operating time and the temperature inside the body itself.

[0009] To perfectly perform the clothes pressing operation, the invention has the aid of devices for straightening the clothes, such as elastic bands which, directly or through accessories, straighten the sleeves and other parts of the garments from the lower part of the apparatus so that during the drying process the clothes are perfectly tensed and come out completely wrinkle-free.

[0010] These elastic bands or straightening means can be replaced with weights, whereby achieving the same straightening.

[0011] According to another feature of the invention, it has been provided that at the bottom of the body there is a tray for collecting the water coming off the clothes after they are hung from the support rod, that said tray is provided with an upper grating preventing direct contact with the water, and that said tray is provided with a pressure switch which cuts off the operation of the machine when the weight of said tray exceeds a pre-established value.

[0012] The mentioned tray lacks a drain so the residual water is eliminated by simple evaporation, specifically by the effect of the air which acts on the mass of water housed in the tray through the grating.

[0013] The incorporation of very powerful respective centrifugal-type fans has been provided, whereby creating a forced movement of the air inside the dryer-press which reduces the time the clothes remain inside the mentioned machine.

[0014] Finally, the invention is focused on other aspects such as:

- First, the dryer-press of the invention has a speed control device for the turbines which introduce the hot air into the body of the dryer-press, which favors a larger amount of air on the garments to be dried and pressed, whereby accelerating the process.
- Second, greater speed of the air allows eliminating the humidity from the drying and pressing enclosure, since greater speed of the air involves lower humidity inside the enclosure and therefore has a significant impact on the drying and pressing conditions.

[0015] The speed control device for the air can be a continuous and progressive control device or it can be a control device with several fixed points of pre-established

speed, according to what is desired in the application.

Description of the Drawings

[0016] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description, in which the following has been depicted with an illustrative and nonlimiting character:

Figure 1 shows a perspective view of a clothes dryer-press carried out according to the object of the present invention, which appears in the closed situation.

Figure 2 shows another perspective view of the dryer-press of the previous figure, now in the open situation and in which the upper turbines with their corresponding heating resistance elements are shown by means of "transparency".

Preferred Embodiment of the Invention

[0017] In view of the mentioned figures, it can be observed how the proposed dryer-press is formed from a prismatic-rectangular body (1), considerably elongated in the vertical direction, the base (2) of which can be provided with support legs or wheels which aid in its change in position, the mentioned body (1) in any case having in the entire front portion an opening which is closed by means of a door (3) and a rod (4) being arranged therein, centered in the front-rear direction and close to its rear end, performing the functions of holding means for the hangers (5) from which the clothes (6) are suspended during the drying process.

[0018] The body (1) ends at the top in a dome (7), most of which has abundant grating (8) which, in the practical embodiment depicted in the drawings, is carried out in three physically independent sectors, because it has been provided that three turbines (9) provided with respective electric heating resistance elements, which have been schematically depicted in Figure 2 as they are considered conventional and commercially available elements, are arranged within the mentioned dome (7), each of these functional units, i.e., each turbine (9) with its corresponding resistance element, having a thermostat making said turbines functionally independent such that in the event of a supposed overheating in one of them, said turbine is disconnected, the other two remaining operative, as previously stated.

[0019] Therefore, the turbines (9) absorb environmental air which enters the dryer-press through the gratings (8) and which is directly supplied to the clothes (6) hanging from the hangers (5), the hot air reaching the lower area of the body (1), and more specifically the lower opening (10) of a pair of vertical side passages (11), the upper opening (12) of which is in turn opposite another grating (13) operatively arranged in the rear area of the dome (7).

[0020] The described structure is functionally complemented with a control device (14), preferably located in the front area of the mentioned dome (7) and in which a programmer for establishing both the operating time and the working temperature of the dryer-press, in addition to the on-off switches of the mentioned turbines (9) with their corresponding resistance elements, are arranged.

[0021] Given that water can come off the clothes when they are taken out of the corresponding washer and are hung from the hangers (5), it has been provided that a tray (15) for collecting water provided at the level of its opening with a grating (16) at the bottom of the body (1), such that with said tray being provided on the entire base of the body (1), it collects all the water that may come off the clothes (6), which is finally eliminated by simple evaporation due to the circulation of air inside the body (1) itself.

[0022] This tray (15), housed for example in the base (2), will rest on the base thereof with the interposition of at least one pressure switch which controls the operation of the dryer-press, such that when the weight of said tray exceeds a pre-established value, such as when a person or animal enters the dryer for example, it prevents the operation thereof, said pressure switch being a safety element.

[0023] Figure 2 shows the means (17) whereby the clothes are straightened inside the machine, being depicted in this figure by means of respective elastic bands pulling down on the sleeves and on the body of the clothes, as well as on any other point thereof to keep them tensed while drying, which allows the clothes to come out perfectly pressed.

[0024] These elastic straightening bands can be replaced with duly graduated weights, whereby the same straightening effect for the garment is achieved.

[0025] On a practical level, it can also be stated that the turbines will be high-powered so that they cause considerable forced air circulation inside the machine and reduce the drying time for the clothes.

[0026] On a practical level, 2 centrifugal-type turbines of approximately 240W have been used, being able to reduce the power if more are used as in the preferred embodiment.

[0027] It can be stated that the heating resistance element uses 750W resistances, with which it is sufficient for creating the suitable heat causing the quick evaporation of the water of the washed clothes.

[0028] This machine stands out for its small dimensions because standard dimensions for such machines can be 40 cm wide by 55 cm deep and 141 cm high, because the devices causing the drying and evaporation of the water are of a rather small size.

[0029] Though not included in the drawings, it must be taken into account that the object of this invention is also centered on incorporating a speed control device which allows willfully changing the speed of the air acting on the garments to dry, whereby achieving quicker drying

when the speed of the air is greater.

[0030] This control can be done with a continuous speed control device, or a stepped control device with several positions which can simulate drying and pressing times for the clothes.

[0031] With this control of the speed of the air, the humidity of the air inside the dryer-press is also controlled and therefore the pressing and drying process is forced to be quicker.

Claims

1. Clothes dryer-press which is formed by means of a hollow body with a practicable door and **characterized in that** it comprises:

   - Means of heating the air circulating inside the apparatus.
   - Means for circulating the forced air inside the apparatus.
   - Means for keeping the clothes straightened inside the apparatus, while the hot air circulating inside dries and presses the clothes.

2. Clothes dryer-press according to claim 1, **characterized in that** the means for causing the circulation of the forced air inside the apparatus have a speed control device for the mentioned air, providing a quicker or slower pressing and drying of the clothes.

3. Dryer-press according to claim 2, **characterized in that** the control means for controlling the speed of the air are electric/electronic means controlling the speed of the air impulse turbines.

4. Dryer-press according to claims 2 and 3, **characterized in that** the control means are continuous.

5. Dryer-press according to claims 2 and 3, **characterized in that** the control means are by means of several fixed points of speed.

6. Dryer-press according to claims 1 to 5, **characterized in that** the speed of the air driven by the turbines affects the humidity prevailing in the enclosure and therefore the drying-pressing time for the clothes.

7. Clothes dryer-press according to claim 1, **characterized in that** the straightening means for the clothes inside the apparatus consist of elastic bands which hold the clothes or areas of the clothes that are being dried and pressed inside the apparatus from the lower and/or upper area.

8. Clothes dryer-press according to claim 1, **characterized in that** the straightening means for the clothes inside the apparatus consist of weights which are held to different areas of the clothes to keep the mentioned clothes tensed.

9. Clothes dryer-press according to claim 1, **characterized in that** the means for circulating the forced air inside the apparatus are formed by at least one turbine.

10. Clothes dryer-press according to claims 1 to 4, **characterized in that** it is formed from a hollow body (1), preferably with thermally insulated walls and provided with a front access door (3) for putting in/taking out clothes, said body (1) being prolonged in the upper area into an abundantly grated dome (7) which houses therein several turbines (9) for introducing air inside the body (1), provided with respective electric heating resistance elements, there being arranged beneath said dome a transverse rod (4) for hanging the recently washed clothes (6) with the aid of hangers (5) from which said clothes are duly suspended to achieve the sought pressing effect while drying.

11. Clothes dryer-press according to claims 1 to 10, **characterized in that** each turbine (9) with its corresponding heating resistance element is opposite a grating (8) of the upper dome (7), said grating (8) preferably being offset towards the front, whereas a second grating (7) is arranged in the rear portion for the exit of the humid air, which is channeled from the lower area of the body (1) through side conduits (11) provided with a lower opening (10) and an upper opening (12), the latter being opposite the mentioned grating (13).

12. Clothes dryer-press according to the previous claims, **characterized in that** each turbine (9) with its corresponding heating resistance element is provided with an independent thermostat, such that in the event of possible overheating of one of said turbines, the operation of the latter is cut off, the rest of them remaining operative.

13. Clothes dryer-press according to the previous claims, **characterized in that** it incorporates a control device (14), preferably located in the front area of the grated dome (7), in which device the on-off switches thereof and a programmer which allows controlling both the time and duration of the drying process and the heat level thereof are arranged.

14. Clothes dryer-press according to the previous claims, **characterized in that** at the bottom of the body (1) there is arranged a tray (15) for collecting the possible water coming off the clothes (6) when they are hung on the rod (4), said tray (15) being provided at the level of its opening with a grating (16).

15. Clothes dryer-press according to claim 14, **characterized in that** the tray (15) with its grating (16) rests on the bottom of the body (1) through at least one pressure switch which, in the event of possible excess weight supported by said tray (15), causes the machine to stop operating until said excess weight is eliminated.

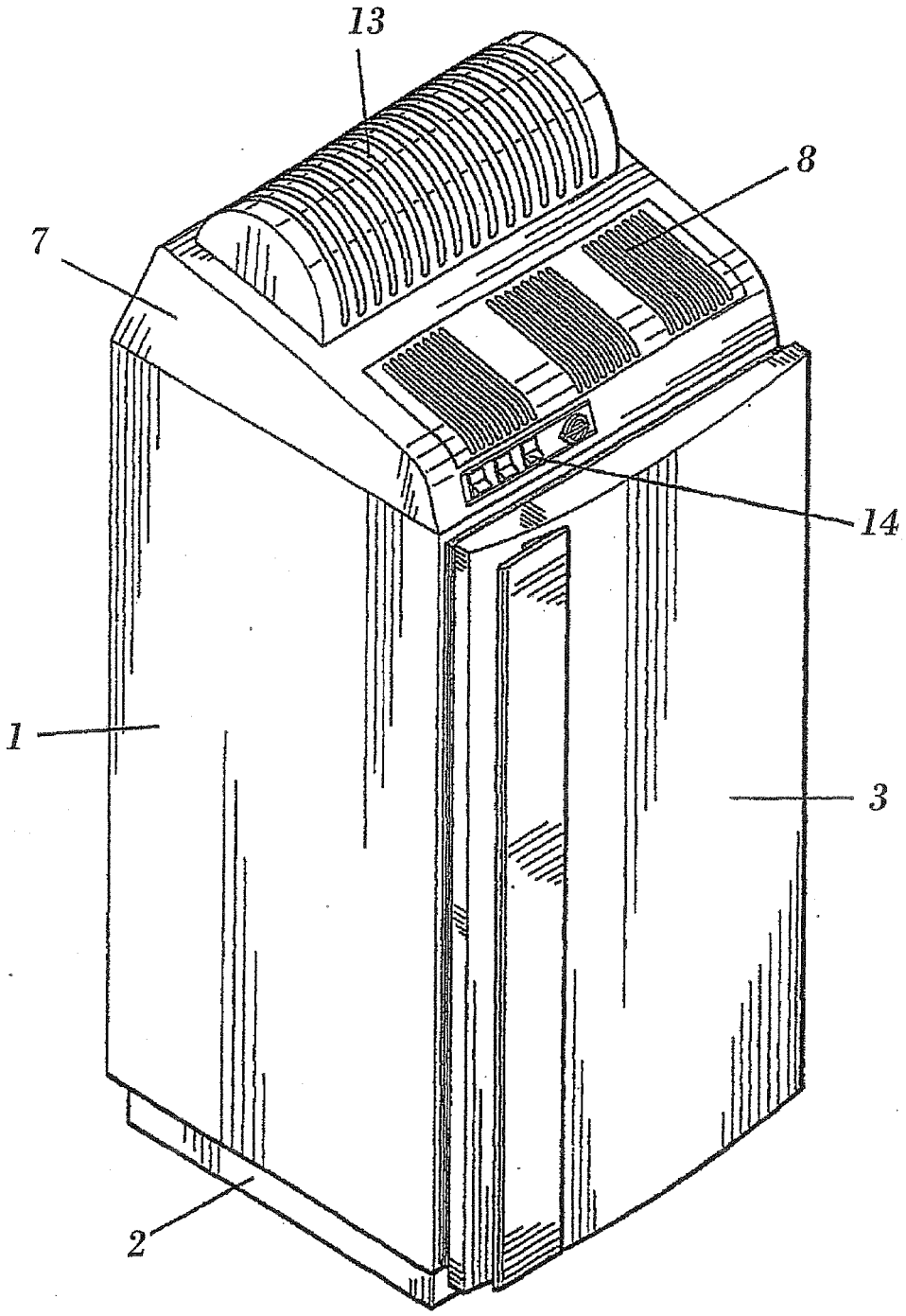

FIG. 1

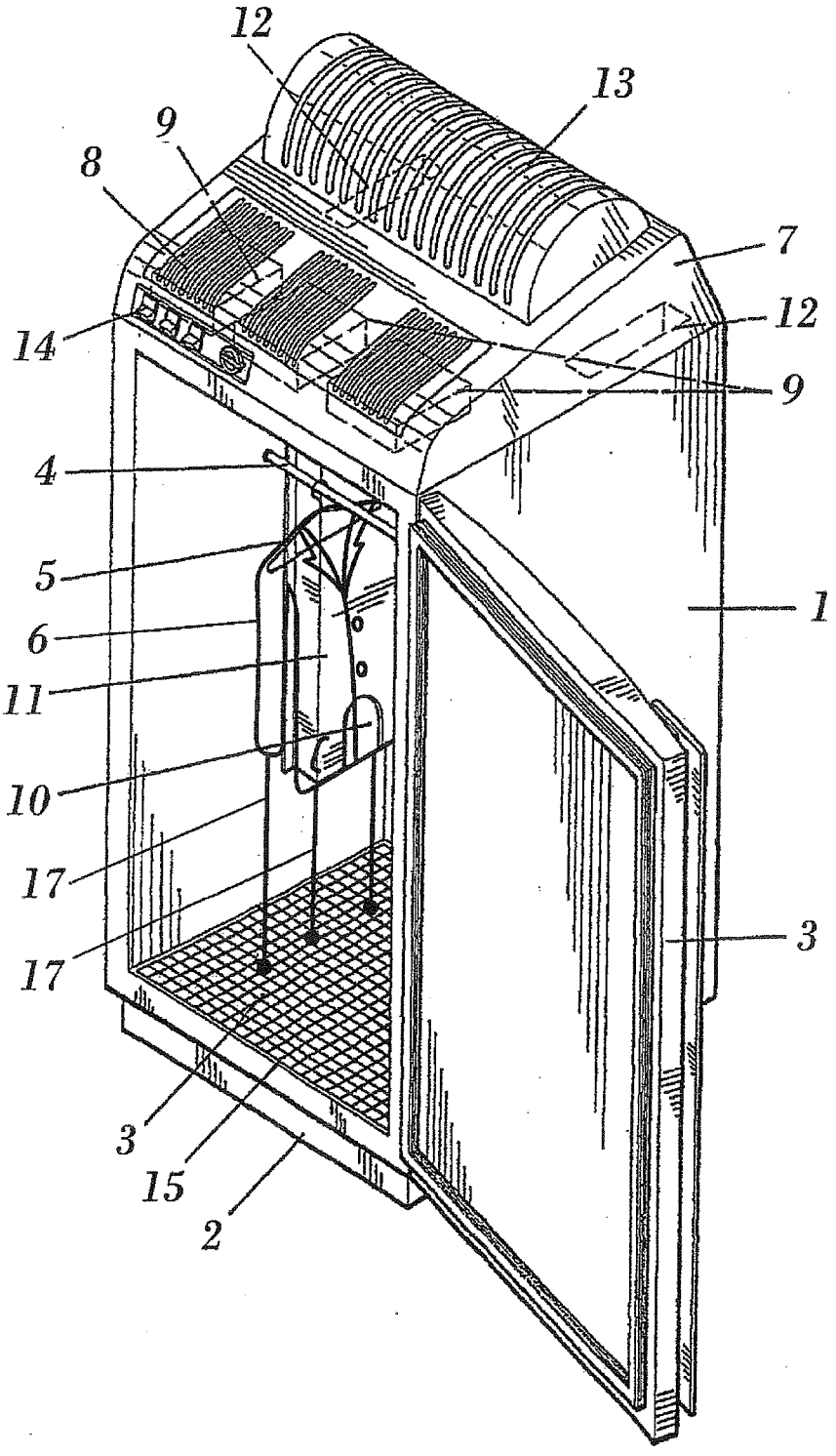

FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2008/000425

A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F58/00, D06F59/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

INVENES,EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007011903 A1 (CHANG et al.) 18.01.2007, paragraphs [12-17] and [19-21]; figures.	1-10, 12-15
X	US 2005278972 A1 (MARUCA et al.) 22.12.2005, paragraphs [13] and [33-37]; figures.	1-15
X	GB 1281927 A (DELLA ROSSA S A S) 19.07.1972, abstract; figures.	1-10, 12-15
X	GB 2394271 A (KANAVAS NIKOLAOS ; MILLS SCOTT JAMES) 21.04.2004, the whole document.	1-10, 12-15
X	JP 7059991 A (NIHEI ISAO) 07.03.1995, (abstract) [online]. Retrieved from the: EPOQUE Database; figures.	1-9, 12-15
X	ES 2281239 A1 (IBAI S COOP) 16.09.2007, abstract; column 3, lines 3-6; figure 1.	1-9,12-15
A	GB 278043 A (CARIN HEDVIG LAUREN) 28.09.1927, figures.	7-8

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/ O.E.P.M. Paseo de la Castellana, 75 28071 Madrid, España. Facsimile No. 34 91 3495304	Authorized officer E. García Lozano Telephone No. +34 913496863

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ ES 2008/000425

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US 2007011903 A	18.01.2007	US 2007011903 A	18.01.2007
US 2005278972 A	22.12.2005	US 7191546 B	20.03.2007
US 2005278972	22.12.2005	US 2005278972 A	22.12.2005
		US 7191546 B	20.03.2007
		WO 2006009774 A	26.01.2006
		US 2007144032 A	28.06.2007
		US 7377052 B	27.05.2008
		RE F	----ment
		US 2007144032	28.06.2007
		US 6845569 [	25.01.2005
		US 5152077 [	06.10.1992
		US 6005227 /R	21.12.1999
		US 5755040 /R	26.05.1998
		US 5870836 /R	16.02.1999
		JP 9101069 /R	15.04.1997
		US 5555640 /R	17.09.1996
		JP 6007597 /R	18.01.1994
		JP 4089099 /R	23.03.1992
		EP 0094356 /R	16.11.1983
		US 3866336 /R	18.02.1975
		WO 2006009774	26.01.2006
		US 5755040 [Y	26.05.1998
		US 5870836 [Y	16.02.1999
		JP 9101069 [Y	15.04.1997
		US 5555640 [Y	17.09.1996
		JP 6007597 [Y	18.01.1994
		US 5152077 [Y	06.10.1992
		JP 4089099 [Y	23.03.1992
		EP 0094356 [Y	16.11.1983
		US 2005278972	22.12.2005
		US 5755040 [	26.05.1998
		JP 9101069 [	15.04.1997
		JP 6007597 [	18.01.1994
		US 6005227 /R	21.12.1999
		US 5870836 /R	16.02.1999
		US 5555640 /R	17.09.1996
		JP 4089099 /R	23.03.1992
		EP 0094356 /R	16.11.1983
		US 3866336 /R	18.02.1975
			18.02.1975
GB 1281927 A	19.07.1972	BE 736683 A	31.12.1969
		NL 6912020 A	10.02.1970
		DE 1935892 A	19.02.1970
		GB 1281927 A	19.07.1972
			19.07.1972
			19.07.1972

Form PCT/ISA/210 (patent family annex) (July 2008)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ ES 2008/000425

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
GB 2394271 AB	21.04.2004	GB 2394271 AB	21.04.2004
GB 2394271	21.04.2004	GB 2394271 AB	21.04.2004
		US 5546678 [	20.08.1996
		GB 2172975 [	01.10.1986
		EP 0094356 [	16.11.1983
		US 4471537 [	18.09.1984
		GB 1591923 [	01.07.1981
		GB 586606 [	25.03.1947
			25.03.1947
JP 7059991 A	07.03.1995	JP 7059991 A	07.03.1995
ES 2281239 AB	16.09.2007	WO 2006100335 A	28.09.2006
ES 2281239	16.09.2007	WO 2006100335 A	28.09.2006
		ES 2281239 AB	16.09.2007
		WO 03074778 [X	12.09.2003
		US 2003056393 [A	27.03.2003
		EP 1006231 [A	07.06.2000
		ES 2072532 T	16.07.1995
		WO 2006100335	28.09.2006
		WO 03074778 [X	12.09.2003
		US 2003056393 [A	27.03.2003
		EP 1006231 [A	07.06.2000
		ES 2072532 T	16.07.1995
GB 278043 A	28.09.1927	GB 278043 A	28.09.1927

Form PCT/ISA/210 (patent family annex) (July 2008)

INTERNATIONAL SEARCH REPORT

International application No.

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CLASSIFICATION OF SUBJECT MATTER

D06F 58/10 (2006.01)
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