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(54) Door for laundry dryer machine and relative laundry dryer machine

(57) A door for laundry dryer machine is described which is provided with a cabinet (1) having a wall (3) having an opening (2) for the loading of the laundry to be dried and with a drum (5) mounted inside said cabinet (1) and which has an opening (8) lined up with the opening (2) of the cabinet (1). The door (4) is suitable to close the opening (2) of the wall (3) of the cabinet (1) and it comprises a rack (10) that is suitable to house shoes and means (11, 125, 109, 122) for the coupling of the rack (10) to the door (4). (Figure 1)

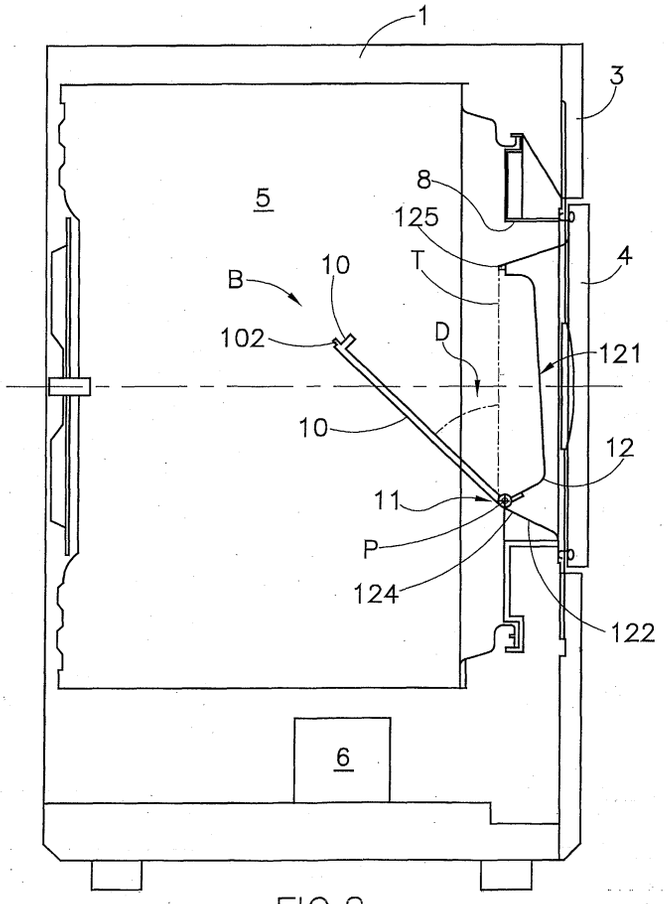

FIG.2

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Description

[0001] The present invention refers to a door for laundry dryer machine and to the relative laundry dryer machine.

[0002] Laundry dryer machines are known in the state of the art which are provided with removable devices for the arrangement of shoes inside the drum of the machine so as to prevent possible strokes of the shoes against the walls of the drum during the drying.

[0003] A laundry dryer machine of this type is shown in the US patent 6374509. The device to fasten the shoes inside the drum of the laundry dryer machine comprises a piece of a material suitable to be stuck to the sole of the shoes, elements for the fastening of said piece around the sole of the shoes and additional elements that allow the fastening of said piece to the drum of the laundry dryer machine.

[0004] A device to fasten the shoes to a drum of a laundry dryer machine as the one previously described presupposes an arrangement of the shoes and their fastening inside the drum on behalf of the user. Such operation is complicated since it determines continuous bendings of the user and interventions of the user inside the drum of the laundry dryer machine.

[0005] In view of the state of the art described, scope of the present invention is to provide a door for laundry dryer machine provided with a rack for shoes in which it is easier to arrange the shoes for the drying.

[0006] According to the present invention, such scope is attained by means of a door for laundry dryer machine, said machine being provided with a cabinet which has a wall provided with an opening for the loading of the laundry to be dried and with a drum mounted inside said cabinet and which has an opening lined up with the opening of the cabinet, said door being suitable to close said opening of the wall of the cabinet, characterised in that it comprises a rack suitable to house shoes and means for the coupling of the rack to the door.

[0007] Always according to the present invention it is possible to provide a laundry dryer machine as defined in claim 8.

[0008] 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 shows a schematic side view of a laundry dryer machine according to the present invention with a door provided with a rack to dry shoes in rest position;

Figure 2 shows the machine in Figure 1 with rack in working position;

Figure 3 is a top view of the machine in Figure 2 with open door;

Figure 4 shows a detail of the door of the machine in Figure 2.

[0009] With reference to Figures 1-3 a laundry dryer machine according to the present invention is schematically shown. Said machine is provided with a cabinet 1 having an opening 2 for the loading of the laundry on the front wall 3 of the cabinet 1. The laundry dryer machine comprises a door 4 suitable to close the opening 2 of the cabinet 1 and a drum 5 suitable to contain the laundry to be dried; the door 4 is hinged in 7 to the front wall 3 of the cabinet 1. The drum 5 can be fixed or it can be rotated by an electric motor and suitable kinematic means. The drum 5 comprises an opening 8 lined up with the opening 2 of the cabinet 1 for the loading of the laundry to be dried. The laundry dryer machine comprises a device 6 for the heating of the air that must be directed towards the drum in order to dry the laundry.

[0010] A rack 10 suitable to support shoes is hinged to said door 4; in particular said rack 10 is coupled by hinge means 11 to the internal part 12, or counter-door 12, of said door 4, that is to the part that with the door 4 closed faces the drum 5.

[0011] Said hinge means 11 for instance comprise extensions 111 of a first end 101 of the rack that extend in perpendicular way to the rack but in parallel way to the door 4 and cavities 112 of the internal part 12 that are suitable to house said extensions 111, as shown in Figure 4; the extensions 111 are coupled in revolving way to said cavities 112 so that the rack 10 can be rotated around an axis P passing through said extensions 111 and said cavity 112.

[0012] The internal part 12 of the door 4 has a cavity 121 that is suitable to house said rack 10 and has a bottom edge 122 and a top edge 123. On the extensions 124 of the bottom edge 122 said cavities 112 are arranged that belong to the hinge means 11.

[0013] The rack 10 can assume a rest position A in which said rack 10 is adjacent and parallel to the door 4, as shown in Figure 1; the rack 10 is arranged inside the cavity 121 of the internal part 12 and it gets locked there by an opportune retainer 125 that operates on a second end 102 of the rack 10 opposite to first end 101. Preferably the retainer 125 is connected with the top edge 123 of the internal part 12 and it can assume a locking position in which it is in engagement with the second end 102 of the rack 10 and a position of release in which it is not any more in engagement with the rack 10. In the position A the rack 10, with the door 4 closed and the laundry dryer machine in function, does not hinder the loading of the laundry and, in case of revolving drum 5, does not hinder the tumbling of the pieces of laundry to be dried.

[0014] In said rest position A the rack 10 must be integrated within the structure of counter-door 12 so as to not offer some roughness that it causes wear of the laundry during the drying of the same one. Therefore the rack 10 must be shaped so as to be integrated within the surface of the structure of counter-door 12 thus forming a single flat surface; the retainer 125 must have such a shape that, when it is in engagement with the end 102

of the rack 10, it forms with the entire rack 10 a flat surface. The structure of the counter-door 12, with the rack 10 in rest position, must have an external structure similar to the doors of the known laundry dryer machines.

[0015] The rack 10 can assume a working position B in which it forms with the door 4, more precisely with a vertical axis T parallel to the door 4 and intersecting the axis P, an angle D smaller than a right angle, preferably of 45°, as shown in Figures 2 and 3. Said position B is assumed by the rack after it has operated on the retainer 125 in order to bring the rack to the position of release and it is determined by an additional retainer 109 belonging to the rack 10 that goes in abutment with the internal part 12 of the door 4. More in detail the retainer 109 is an extension of the first end 101 of the rack 10. Said retainer 109, after the rack 10 is rotated around the axis P of an angle D with respect to the vertical axis T, goes in abutment with a part of the bottom edge 122 of the cavity 121 thus determining the working position B of the rack 10. In said position B the rack can house shoes to be dried inside the laundry dryer machine.

[0016] Therefore if a user wishes to dry shoes, for instance tennis shoes, with the door 4 open the user operates on the retainer 125 so that the rack 10 assumes the working position B. The user can arrange a pair of shoes on the rack 10 and close the door 4; with the door 4 closed the rack 10 will be inside the drying drum 5 and it will be possible to provide to the drying of the shoes.

[0017] The rack 10 has dimensions smaller than the door 4 and in addition it must have sizes such as to allow the easy closing of the door 4 with the rack 10 in working position B. For this reason the rack 10 has preferably a bevelled angle in order to favour its input into the drum 5.

[0018] With the rack 10 a device for the drying of the shoes in a laundry dryer machine is obtained in which it is easier to arrange the shoes.

[0019] The rack 10 presupposes for its installation not any intervention on the laundry dryer machine but only on the door whose internal part is modified in order to house the rack 10. Therefore in a known laundry dryer machine it is sufficient to change to the type of door closing the opening for the loading of the laundry using door like the door 4 previously described in order to obtain with the rack 10 a device for the drying of the shoes.

Claims

1. Door for laundry dryer machine, said machine being provided with a cabinet which has a wall (3) provided with an opening (2) for the loading of the laundry to be dried and with a drum (5) mounted into said cabinet (1) and which has an opening (8) lined up with the opening (2) of the cabinet (1), said door (4) being suitable to close said opening (2) of the wall (3) of the cabinet (1), **characterised in that** it comprises a rack (10) suitable to house shoes and means (11, 125, 109, 122) for the coupling of the rack (10) with the door (4).

2. Door according to claim 1, **characterised in that** said coupling means (11, 125, 109, 122) couple said rack (10) to the part (12) of the door (4) that faces towards the opening (8) of the drum (5).

3. Door according to claim 2, **characterised in that** said coupling means (11, 125, 109, 122) are suitable to determine a rest position (A) of said rack (10) where the rack (10) is adjacent to said door (4) and a working position (B) of said rack (10) where the rack (10) is arranged so as to form an angle (D) smaller than a right angle with said door (4).

4. Door according to claim 3, **characterised in that** said coupling means (11, 125, 109, 122) comprise a hinge (11) for the revolving engagement of a first end (101) of the rack (10) with said door (4), a first retainer (125) integral with said door (4) and which operates on a second end (102) of the rack (10), opposite to the first end (101), in said rest position (A) in order to fasten said rack (10) and a second retainer (109) operating on the rack (10) to fasten it in said working position (B).

5. Door according to claim 4, **characterised in that** said second retainer (109) comprises an appendix (109) of the first end (101) of the rack (10) that is suitable to engage with a portion (122) of the door (4) in said working position (B).

6. Door according to claim 3, **characterised in that** said part (12) of the door (4) that faces towards the opening (8) of the drum (5) comprises a cavity (121) that is suitable to house the rack (10) in said rest position (A).

7. Door according to claim 1, **characterised in that** said rack (10) in said rest position (A) is integrated within the structure of the part (12) of the door (4) that faces towards the opening (8) of the drum (5) in such way so as to form with it a flat surface opposite the opening (8) of the drum (5).

8. Laundry dryer machine comprising a cabinet (1) provided with a wall (3) provided with an opening (2) for the loading of the laundry to be dried and with a door (4) suitable to close said opening (2), with a drum (5) mounted inside the cabinet (1) which has an opening (8) lined up with the opening (2) of the cabinet (1), **characterised in that** said door (4) comprises a rack (10) suitable to house shoes and means (11, 125, 109, 122) for the coupling of the rack (10) to the door (4).

9. Machine according to claim 8, **characterised in that** said coupling means (11, 125, 109, 122) couple

said rack (10) to the part (12) of the door (4) that faces towards the opening (8) of the drum (5).

10. Machine according to claim 9, **characterised in that** said coupling means (11, 125, 109, 122) are suitable to determine a rest position (A) of said rack (10) where the rack (10) is adjacent to said door (4) and a working position (B) of said rack (10) where the rack (10) it is arranged so as to form an angle (D) smaller than a right angle with said door (4).

11. Machine according to claim 10, **characterised in that** said coupling means (11, 125, 109, 122) comprises a hinge (11) for the revolving engagement of a first end (101) of the rack (10) with said door (4), a first retainer (125) integral with said door (4) and which operates on a second end (102) of the rack (10), opposite to the first end (101), in said rest position (A) in order to fasten said rack (10) and a second retainer (109) operating on the rack (10) so as to fasten it in said working position (B).

12. Machine according to claim 11, **characterised in that** said second retainer (109) comprises an appendix (109) of the first end (101) of the rack (10) that is suitable to engage with a portion (122) of the door (4) in said working position (B).

13. Machine according to claim 10, **characterised in that** said part (12) of the door (4) that faces towards the opening (8) of the drum (5) comprises a cavity (121) that is suitable to house the rack (10) in said rest position (A).

14. Machine according to claim 8, **characterised in that** said opening (2) of the cabinet (1) is arranged in the front wall of the cabinet (1).

15. Machine according to claim 8, **characterised in that** said rack (10) in said rest position (A) is integrated within the structure of the part (12) of the door (4) that faces towards the opening (8) of the drum (5) in such way so as to form with it a flat surface opposite the opening (8) of the drum (5).

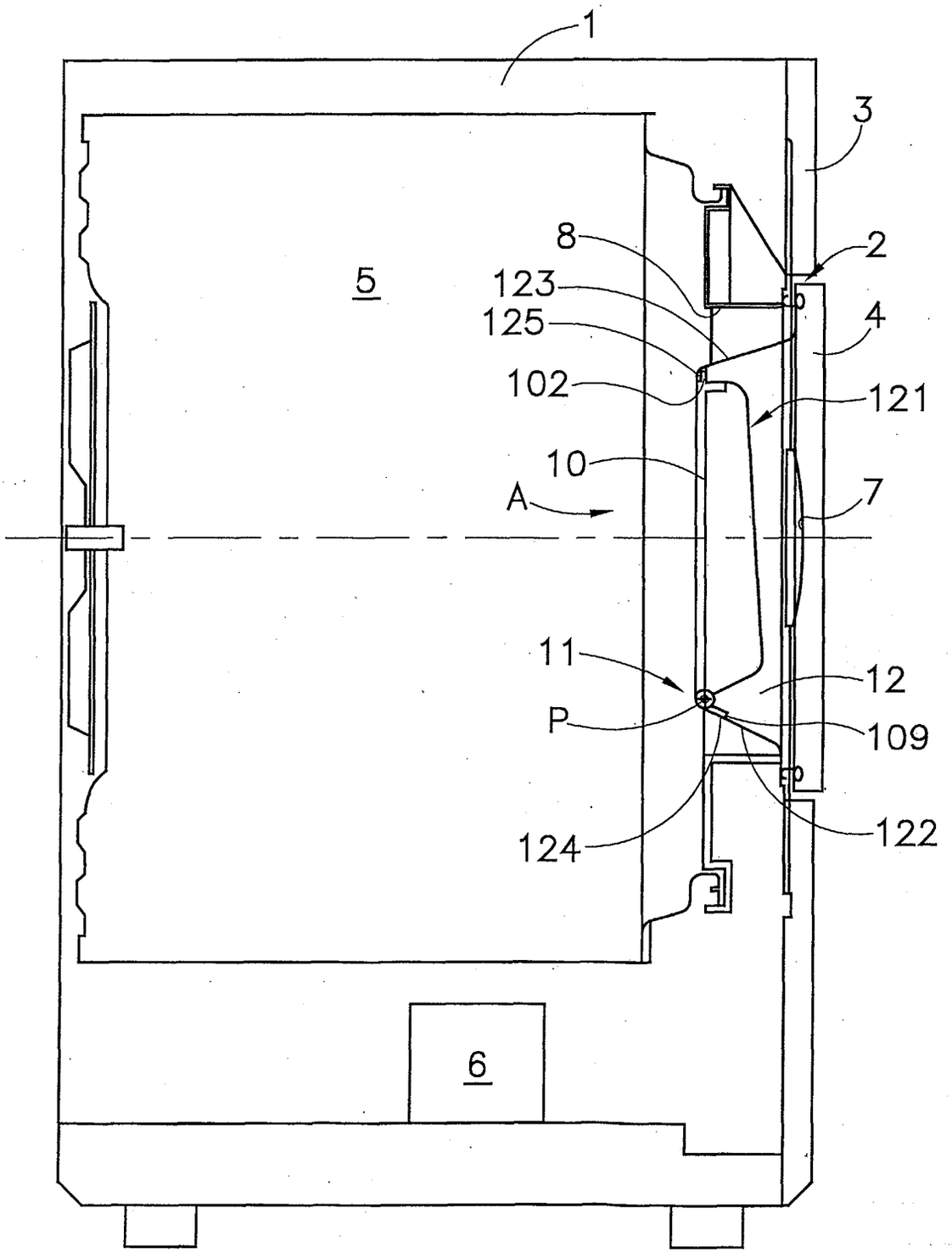

FIG.1

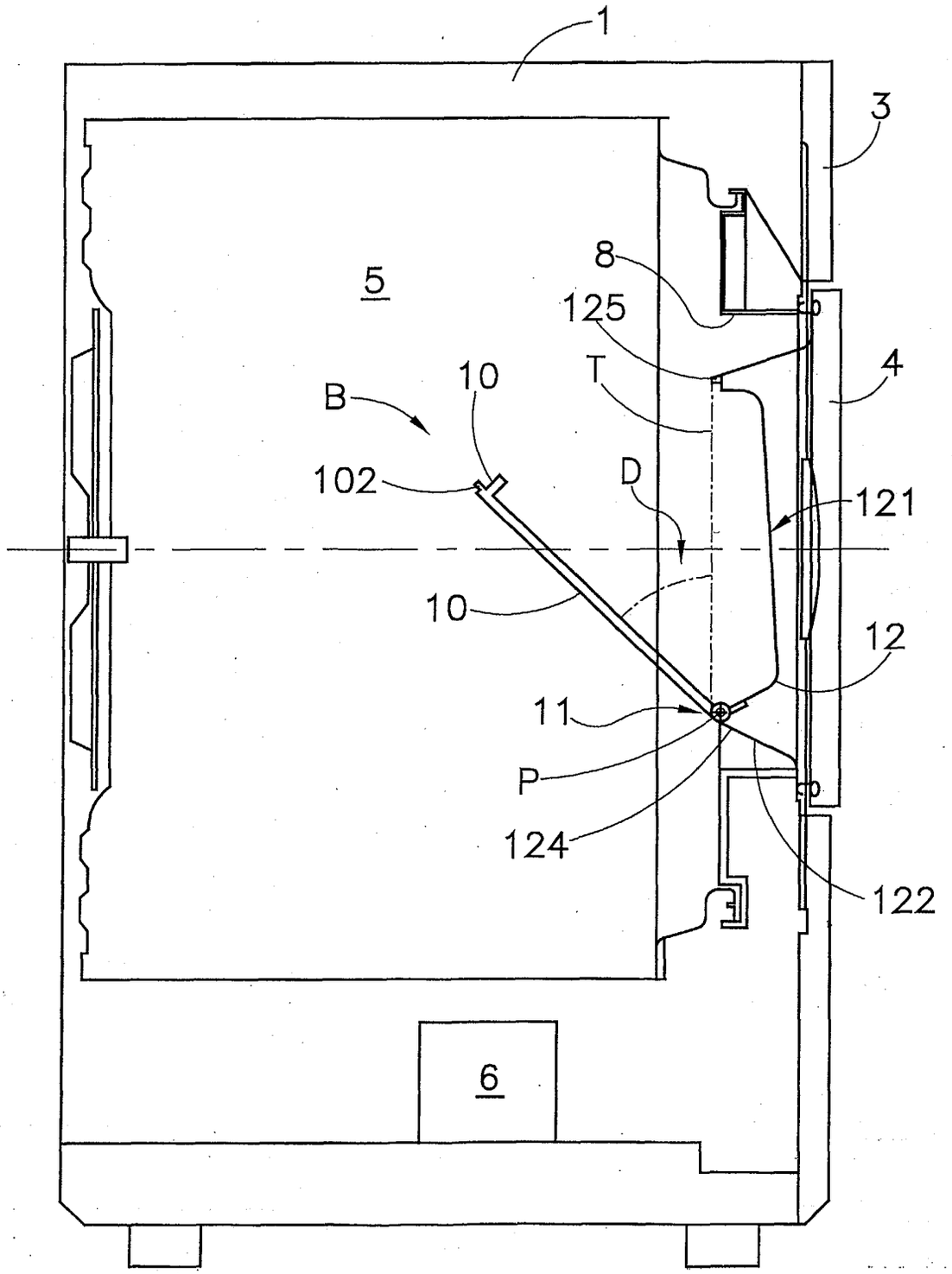

FIG.2

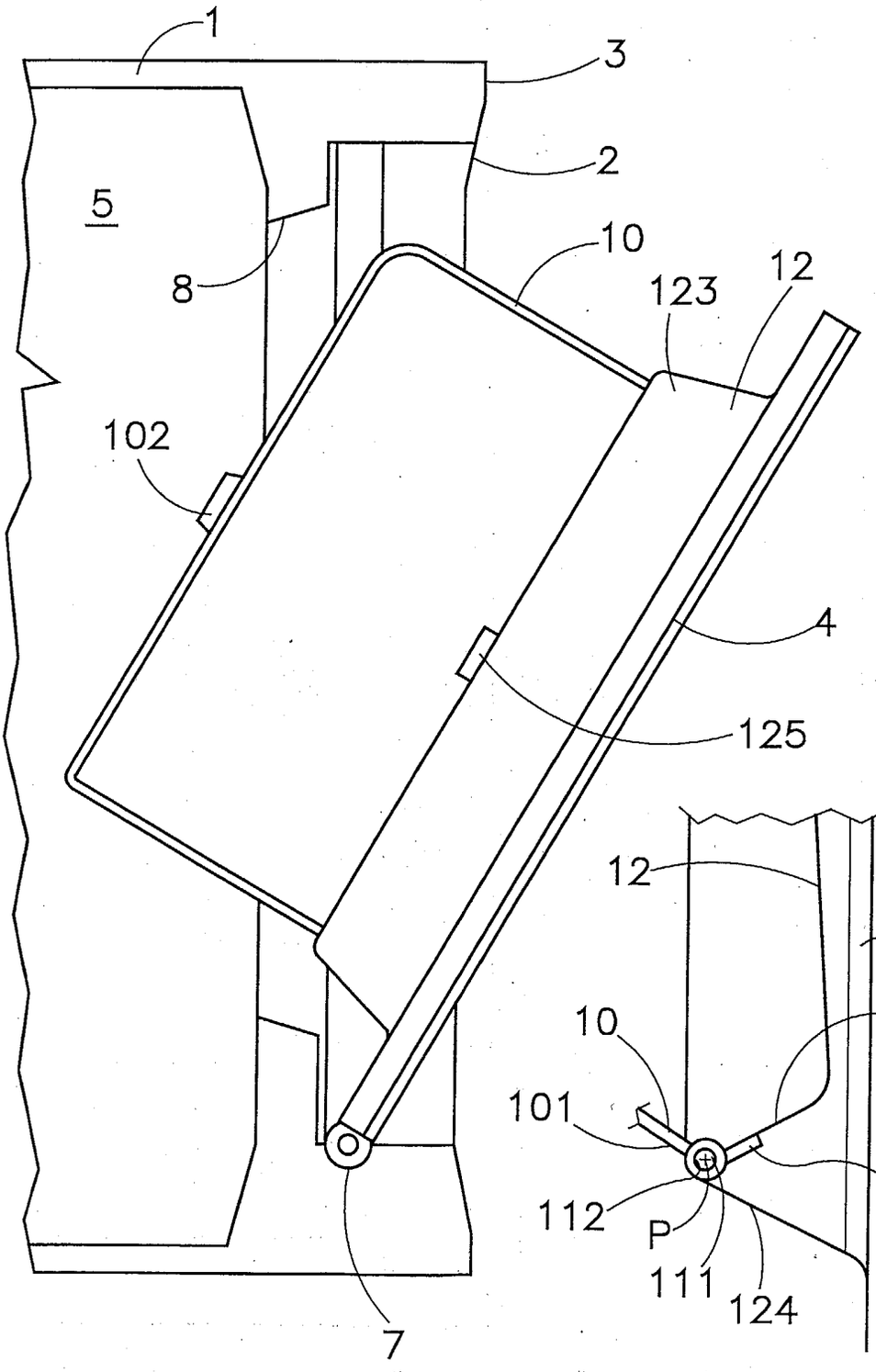

FIG.3

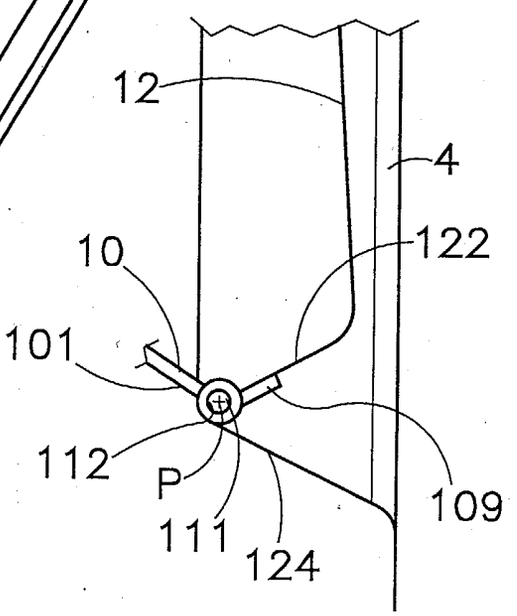

FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5659

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	US 4 677 760 A (ST LOUIS ROBERT M) 7 July 1987 (1987-07-07) * column 3, line 41 - column 4, line 34; figures 6-8 *	1-15	D06F58/04
X A	WO 00 39383 A (VALENT LUCIO ;ELECTROLUX ZANUSSI ELETTRODOME (IT)) 6 July 2000 (2000-07-06) * the whole document *	1-4, 6-11, 13-15 5,12	
X A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 02, 26 February 1999 (1999-02-26) -& JP 10 309399 A (HITACHI LTD), 24 November 1998 (1998-11-24) * abstract; figures *	1,2,7-9, 14,15 3-6, 10-13	
X	US 2 628 432 A (MORRISON HAROLD E) 17 February 1953 (1953-02-17) * the whole document *	1,2,8,9, 14	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
X	US 2003/010736 A1 (HOPE RICHARD) 16 January 2003 (2003-01-16) * abstract; figures *	1,2,8,9, 14	D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	12 March 2004	Falkentoft, C

CATEGORY OF CITED DOCUMENTS

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12-03-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4677760 A	07-07-1987	CA 1253334 A1	02-05-1989
WO 0039383 A	06-07-2000	IT PN980058 U1	23-06-2000
		WO 0039383 A1	06-07-2000
JP 10309399 A	24-11-1998	NONE	
US 2628432 A	17-02-1953	NONE	
US 2003010736 A1	16-01-2003	NONE	

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