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(54) **Combined clothes- horse and heating system**

(57) The present invention relates to a combined clothes-horse and heating system that comprises at least one heating radiator (1) and one clothes-horse (2), in which the radiator (1) and/or clothes-horse (2) are designed to be rotated from open position to closed position, the open position corresponding to the horizontal overlapped position of the radiator (1) and/or clothes-horse (2), and the closed position corresponding to the vertical position of the radiator (1) and/or clothes-horse (2).

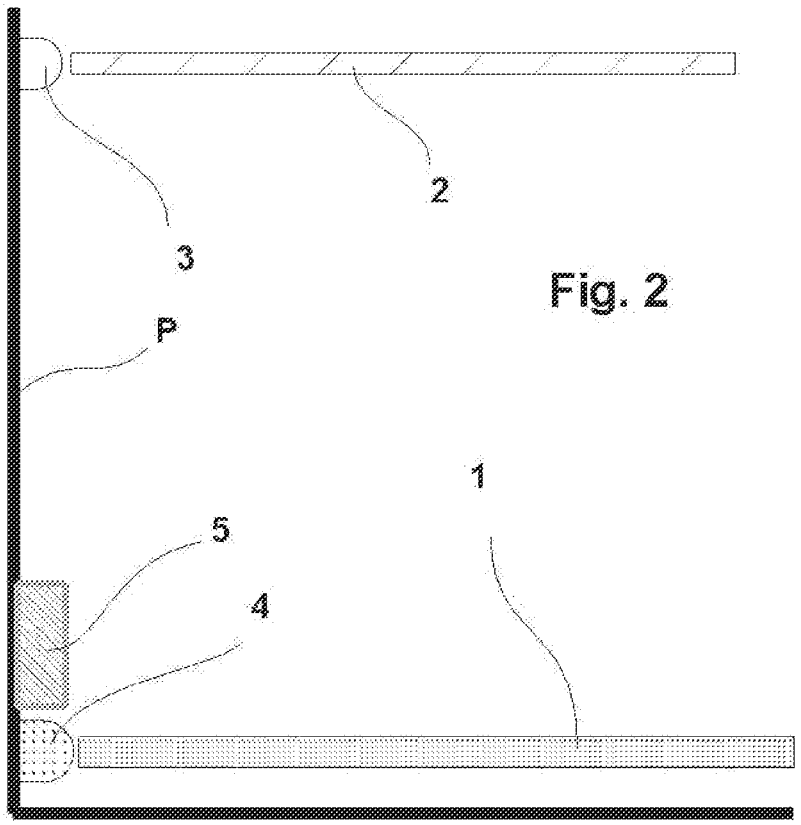

Fig. 2

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Description

[0001] The present invention relates to a combined clothes-horse and heating system of the type comprising at least one heating radiator and one clothes-horse.

[0002] According to the known art, systems of the above type are known and largely used, in spite of some inconveniences.

[0003] A system of the said type according to the known art is normally known as "towel warmer", being typically installed in bathrooms.

[0004] The towel warmer according to the known art comprises a vertical radiator with large volume, in which the heating elements consist in horizontal tubes arranged between two vertical uprights, which provide sufficient space to insert towels to be heated or dried after use.

[0005] The main inconvenience of towel warmers according to the known art is related to the fact that they cannot be used to dry a large number of wet garments or towels: because of vertical arrangement, the garments that are placed on the towel warmer to dry are in mutual contact, thus impairing the drying effect and requiring a long drying time.

[0006] Moreover, the garments are in direct contact with the radiant elements of the radiator and the contact area between the fabric and the radiant element may get damaged due to prolonged contact and high temperature. It appears evident that if a large number of wet garments is placed on towel warmers of the known art, the parts of the garments that are in direct contact with the radiant elements will dry quicker, and the parts of the garments that are not in contact with the radiant elements and are overlapped with other garments will need a much longer drying time, with consequent damages on the parts of garments in direct contact with the radiant elements that have already been dried.

[0007] In brief, towel warmers according to the known art can only be used in two operating conditions: when a few garments are dried, in such a way that they are not - or only partially - in mutual contact, and with humid - not wet - garments, in such a way that drying is not long.

[0008] The purpose of the present invention is to provide a combined clothes-horse and heating system of the type described above that provides a simple inexpensive solution to the aforementioned inconveniences.

[0009] The aforementioned purposes are achieved by the present invention by means of a combined clothes-horse and heating system that comprises at least one heating radiator and one clothes-horse, in which the radiator and/or clothes-horse are designed to be rotated from open position to closed position, the open position corresponding to the horizontal overlapped position of the radiator and/or clothes-horse, and the closed position corresponding to the vertical position of the radiator and/or clothes-horse.

[0010] In other words, according to a preferred executive embodiment the combined system of the present invention provides for the presence of a radiator and a clothes horse that are kept vertical in closed or idle position, for example against a wall, and overlapped in horizontal position in open or working position.

[0011] According to the preferred executive embodiment, when the clothes-horse and the radiator are in open position, the clothes-horse is in horizontal position above the horizontal radiator at a preferred distance, in such a way that the clothes-horse and radiator are completely overlapped and, rising because of ordinary convective effect, the hot air generated by the radiator is advantageously used to dry the garments placed on the clothes-horse above the radiator.

[0012] The advantage of the combined system according to the present invention is that the garments are placed to dry on a traditional clothes-horse, for example with grid or rod configuration, and are not in direct contact with the radiant elements of the radiator, thus avoiding damaging the fabric. Reference is made, for instance, to synthetic fabrics that risk losing their characteristics because of temperature when in direct contact with the radiant elements of the radiator.

[0013] Another advantage is that, since according to the preferred embodiment both the clothes-horse and the radiator are designed to rotate, they have an extremely limited volume in closed position: when no garments are dried, the clothes-horse and the radiator are advantageously rotated to reach a vertical position against the wall, in such a way that the volume is basically identical to the volume of an ordinary heating radiator. The radiator and clothes-horse are rotated in horizontal position, protruding from the wall, only when garments are dried.

[0014] Another advantage with respect to traditional towel warmers is that a large number of garments can be efficaciously dried, being much higher than the number of garments that can be dried on a towel warmer of the known art. Moreover, the clothes-horse can be used to dry wet - not only humid - garments since their position on the horizontal clothes-horse does not create any overlapping between two garments positioned on the clothes-horse one next to the other, being exactly situated above the radiator, and receiving the hot air rising from the radiator for quick and safe drying.

[0015] Further characteristics and improvements are the object of the appended claims and subclaims.

[0016] The characteristics of the invention and consequent advantages will be more evident following to a detailed description of drawings, whereby:

fig. 1 is a side view of the system according to the present invention in closed position;

fig. 2 is a side view of the system according to the present invention in open position;

fig. 3 illustrates a first executive embodiment of the means used to move of the radiator of the system according to the present invention;

fig. 4 illustrates a second executive embodiment of the means used to move of the radiator of the system according to the present invention;

fig. 5 illustrates a third executive embodiment of the means used to move of the radiator of the system according to the present invention;
fig. 6 illustrates a fourth executive embodiment of the means used to move of the radiator of the system according to the present invention;
fig. 7 illustrates a first executive embodiment of the means used to support and feed the radiator of the system according to the present invention;
fig. 8 illustrates a second executive embodiment of the means used to support and feed the radiator of the system according to the present invention;
fig. 9 illustrates an executive embodiment of the system according to the present invention provided with a ventilation device.

[0017] Figs. 1 and 2 illustrate a combined clothes-horse and heating system that comprises at least one heating radiator (1) and one clothes-horse (2) according to the present invention.

[0018] The radiator (1) and clothes-horse (2) are designed to rotate from open or working position shown in fig. 2 to closed or idle position shown in fig. 1.

[0019] The open position corresponds to the horizontal overlapped position of the radiator (1) and clothes-horse (2), while the closed position corresponds to the vertical position of the radiator (1) and clothes-horse (2).

[0020] According to the preferred executive embodiment illustrated in the figures, the radiator (1) and clothes-horse (2) are positioned against a wall (P), although they may also be applied to a piece of furniture and/or internal decoration article or similar item.

[0021] The closed position illustrated in fig. 1 efficaciously reduces the volume in idle condition, in such a way that, when in idle or non-operating condition, the system of the present invention occupies reduced space, which is basically identical to the space occupied by an ordinary heating radiator of the known art.

[0022] When garments are dried, the system is opened as illustrated in fig. 2, in such a way that the radiator (1) and clothes-horse (2) are in horizontal overlapped position, and the hot air rising from the radiator (1) by convection intercepts the garments placed on the clothes-horse (2) and dries them.

[0023] More generally, the radiator may be an electrical radiator or a radiator with convector fluid, such as water, oil or similar fluids, or of any other known type.

[0024] Figs. 1 and 2 illustrate the means (5) used to move the radiator, the means (4) used to support and feed the radiator and the means (3) used to move the clothes-horse.

[0025] Although the preferred executive embodiment illustrated in the figures is provided with means (5) used to move the radiator, the same means may be not provided without leaving the protection scope and precepts of the present invention. The means (5) used to move the radiator are extremely advantageous since they facilitate moving the radiator, which is typically very heavy, in particular from horizontal to vertical position, since the movement from the vertical to the horizontal position is facilitated by the weight force applied on the radiator.

[0026] Figs. 3, 4, 5 and 6 illustrate four alternative executive embodiments of the means (5) used to move the radiator.

[0027] In particular, fig. 3 illustrates an executive embodiment of the means (5) comprising at least one, preferably more mutually hinged levers (5a) and one elastic element (5b) designed to return the radiator (1) in vertical position or facilitate the passage from open position to closed position.

[0028] Fig. 4 illustrates a second executive embodiment in which the means (5) comprise a belt (5d) that is wound around a reel (5c) provided with elastic return of the belt (5d). The belt (5d) is advantageously associated with the free end of the radiator (1) in such a way to take advantage of the force applied on a long arm.

[0029] Fig. 5 illustrates a third executive embodiment of the means (5) that provides for a hydraulic device (5e), such as hydraulic piston or similar element, or alternatively an air piston or similar element, the said hydraulic device (5e) being associated with the radiator (1) and the wall (P) in such a way to advantageously return the radiator (1) in vertical position.

[0030] Fig. 6 illustrates a fourth embodiment of the means (5) that comprises an elastic element (5f), such as a spiral elastic spring or similar element, connected to the radiator (1) and the wall (P), in such a way to facilitate the movement of the radiator in vertical closed position.

[0031] The radiator is advantageously provided with means (4) used to support and feed the radiator, as generically illustrated in figs. 1 and 2 and in two preferred executive embodiments in figs. 7 and 8.

[0032] The means (4) used to support and feed the radiator are designed to support the radiator (1) with respect to the wall (P), basically acting as pivot around which the radiator (1) rotates to pass from closed position to open position and vice versa. Moreover, the means (4) used to support and feed the radiator feed the radiator (1) either in integrated mode or non-integrated mode.

[0033] According to the preferred executive embodiment illustrated in the enclosed figures, the radiator is a radiator with convector fluid provided with at least one inlet and one output for the convector fluid that circulates inside it.

[0034] According to the executive embodiment illustrated in fig. 7, the means (4) used to support and feed the radiator are of non-integrated type, that is to say comprise separate support means (4a) and separate feed means (4b). In particular, according to the preferred solution illustrated in fig. 4, the support means (4a) consist in a sort of bracket fixed to the wall (P) with a pin around which the radiator (1) rotates.

[0035] According to fig. 4 the feed means (4b) are obtained as a flexible duct, for illustrative, not limiting purposes, a metal braid or similar element, which is con-

nected to the radiator (1) and to a feed duct of the convector fluid.

[0036] Following the aforementioned precepts, in case of an electrical radiator (1), an expert of the art will be able to replace, without any inventive effort, the hydraulic feed duct (4b) with an electrical duct to feed electricity to the radiator (1).

[0037] Alternatively, the support and feed means of the radiator (4) are advantageously integrated, that is to say integrate both the support function and the feed function of the radiator, as illustrated in the preferred executive embodiment of fig. 8.

[0038] In this case the support and feed means of a radiator (1) with convector fluid consists in a rotary valve (4c) of known type. Rotary valves (4c) allow both for passage of fluids and rotation of the outlet branch of the valve with respect to the inlet branch and vice versa, and also allow for withstanding relatively heavy weights, such as a radiator, advantageously integrating the two functions of supporting and feeding the radiator (1) in a single device that is simple to assemble and has a reduced weight.

[0039] Moreover, a ventilation device (6) may be provided in order to facilitate and accelerate the drying of the garments on the clothes-horse (2), as diagrammatically shown in fig. 9.

[0040] The ventilation device (6) is designed to blow or convey hot air from the radiator on the garments on the clothes-horse (2) and advantageously reduce drying time.

[0041] According to a preferred executive embodiment, the ventilation device comprises at least one, preferably two convectors positioned under the radiator (1) with possibility of rotation with respect to the wall (P). The convectors are designed to rotate in order to considerably reduce their volume in closed position, against the wall (P), either entirely or partially under the radiator in open position, as shown in fig. 9.

[0042] The means (3) used to move the clothes-horse can be simply obtained as a bracket that protrudes from the wall (P) provided with a rotational pin for the clothes-horse (2) or can alternatively have more complex characteristics, for instance the same characteristics as the means used to move the radiator.

[0043] According to the preferred embodiment illustrated in the enclosed figures, the clothes-horse (2) rotates with respect to the wall (P) to be alternatively arranged in closed vertical position or in open horizontal position. According to an alternative executive embodiment, the movement of the clothes-horse is a vertical extraction movement from closed position, followed by a rotation around the means (3) used to move the clothes-horse. The clothes-horse (2) is extracted basically from closed vertical position and rotated in open position when the lower end reaches the means (3) used to move the clothes-horse.

[0044] Moreover, the system of the present invention can advantageously be provided with lock/unlock means, such as snap-in or similar means, not shown and of known type, designed to lock the radiator (1) and/or the clothes horse (2) in intermediate positions between open position and closed position, by providing a flexible system in which the volume in open position can be adjusted according to the number of garments that are dried on the clothes-horse.

Claims

1. Combined clothes-horse and heating system that comprises at least one heating radiator (1) and one clothes-horse (2) **characterised in that** the radiator (1) and/or clothes-horse (2) are designed to be rotated from open position to closed position, the open position corresponding to the overlapped horizontal position of the radiator (1) and/or clothes-horse (2), and the closed position corresponding to the vertical position of the radiator (1) and/or clothes-horse (2).

2. System as claimed in claim 1, **characterised in that** the radiator (1) and the clothes-horse (2) are positioned against a wall (P), a piece of furniture and/or an interior decoration article or similar item.

3. System as claimed in one or more of the above claims, **characterised in that** in open condition the radiator (1) and the clothes-horse (2) are in overlapped horizontal position.

4. System as claimed in one or more of the above claims, **characterised in that** the radiator is an electrical radiator or a radiator with convector fluid, such as water, oil or similar fluids.

5. System as claimed in one or more of the above claims, **characterised in that** it comprises means (4) used to feed and/or support the radiator (1) with respect to the wall (P), being the pivot around which the radiator (1) rotates to pass from closed to open position and vice versa.

6. System as claimed in claim 5, **characterised in that** the means (4) are designed to support and feed the radiator (1) in non-integrated mode, by providing separate support means (4a) and separate feed means (4b).

7. System as claimed in claim 6, **characterised in that** the support means (4a) are a sort of bracket fixed to the wall (P) with a pin around which the radiator (1) rotates and the feed means (4b) are a flexible duct, for example metal braid or similar item, connected to the radiator (1).

8. System as claimed in claim 7, **characterised in that** the radiator is a radiator with convector fluid and the feed means (4b) consist at least in one duct used to

feed the convector fluid to/from the radiator (1).

9. System as claimed in claim 7, **characterised in that** the radiator is an electrical radiator and the feed means (4b) consist in at least one electrical duct used to feed electricity to the radiator (1).

10. System as claimed in claim 5, **characterised in that** the means (4) used to support and feed the radiator (1) are integrated means designed to support and feed the radiator (1).

11. System as claimed in claim 10, **characterised in that** the radiator (1) is a radiator with convector fluid and the support and feed means (4) are at least one, preferably two rotary valves (4c) designed to allow both for the passage of the convector fluid and rotation of the outlet branch of the valve with respect to the inlet branch and vice versa.

12. System as claimed in one or more of the above claims, **characterised in that** the system also comprises means (5) used to move the radiator (1) from horizontal position to vertical position.

13. System as claimed in claim 12, **characterised in that** the means (5) comprise at least one, preferably multiple mutually hinged levers (5a) and at least one elastic element (5b) designed to bring back the radiator (1) in vertical position or facilitate the passage from open position to closed position.

14. System as claimed in claim 12, **characterised in that** the means (5) comprise a belt (5d) designed to be wound around a reel (5c) with elastic return of the belt (5d), the said belt (5d) being associated at the free end of the radiator (1).

15. System as claimed in claim 12, **characterised in that** the means (5) comprise a hydraulic device (5e), such as hydraulic piston or similar element, or alternatively an air piston or similar element, the said hydraulic device (5e) being associated with the radiator (1) and the wall (P) in such a way to bring back the radiator (1) in vertical position.

16. System as claimed in claim 12, **characterised in that** the means (5) comprise at least an elastic element (5f), such as a spiral elastic spring or similar element connected to the radiator (1) and wall (P).

17. System as claimed in one or more of the above claims, **characterised in that** it also comprises at least a ventilation device (6) designed to blow or convey hot air from the radiator onto the clothes or garments on the clothes-horse (2) .

18. System as claimed in one or more of the above claims, **characterised in that** the ventilation device (6) comprises at least one, preferably two convectors positioned in such a way to rotate with respect to the wall (P) under the radiator (1), the said convectors being designed to rotate in order to considerably reduce their volume in closed position against the wall (P) and to be positioned, either completely or in part, under the radiator (1) in open condition.

19. System as claimed in one or more of the above claims, **characterised in that** the system also comprises means (3) used to move the clothes-horse.

20. System as claimed in claim 19, **characterised in that** the means (3) consist in a bracket that protrudes from the wall (P) provided with a pivoting pin for the clothes-horse (2).

21. System as claimed in claim 19, **characterised in that** the means (3) have one or more characteristics identical to the means used to move the radiator according to one or more of the above claims.

22. System as claimed in one or more of the above claims, **characterised in that** the movement used to position the clothes-horse consists in vertical extraction from closed position, followed by a rotational movement around the means (3).

23. System as claimed in one or more of the above claims, **characterised in that** it provides for lock/unlock means, such as snap-in or similar means to lock the radiator (1) and/or the clothes-horse (2) in intermediate positions between open and closed position.

Fig. 2

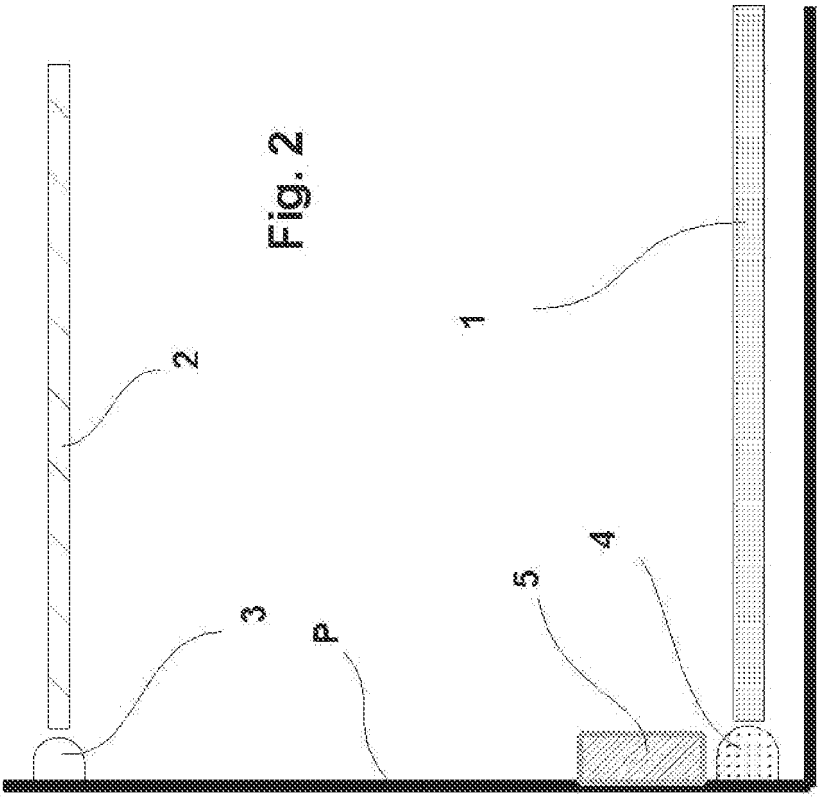
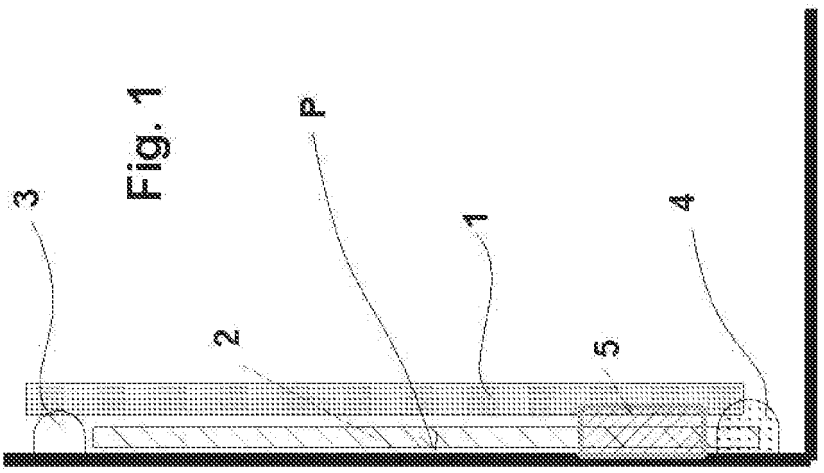


Fig. 1



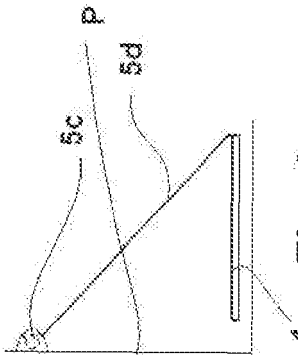


Fig. 4

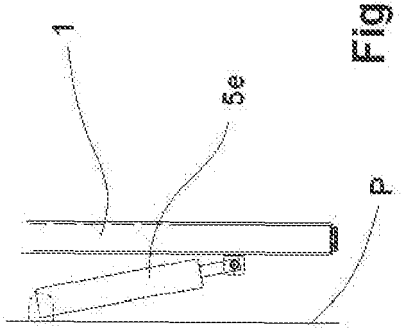


Fig. 5

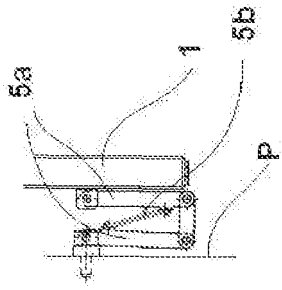


Fig. 3

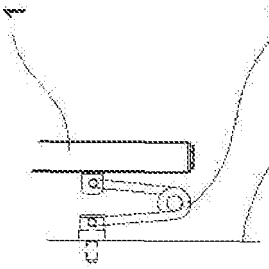


Fig. 6

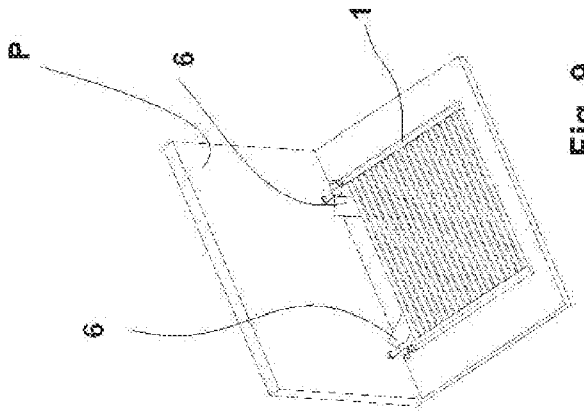


Fig. 9

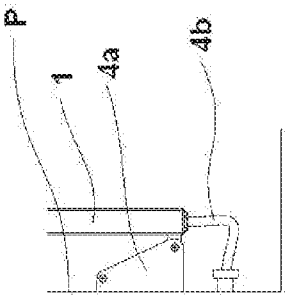


Fig. 7

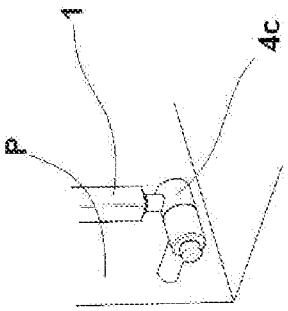


Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 08 16 8318

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CH 310 482 A (BURKOLTER PAUL [CH]) 31 October 1955 (1955-10-31) * the whole document *	1-4,12, 19,22	INV. D06F58/14
X	WO 02/20894 A (CADIF SRL [IT]; STABILE ALDO [IT]) 14 March 2002 (2002-03-14) * page 5, line 15 - page 7, line 4; figures 1,2,5-7 *	1,2,4, 12,19,20	
A	AU 2004 100 506 A4 (GOONETILLEKE MIKE) 23 September 2004 (2004-09-23) * page 5, line 15 - page 5, line 45; figure 1 *	1	
A	WO 2008/039086 A (HEATED CLOTHES RACK COMPANY LT [NZ]; COSTELLO JASON MATTHEW [NZ]; ADAM) 3 April 2008 (2008-04-03) * page 11, line 25 - page 16, line 32; figures 1,5 *	1	
A	DE 203 06 361 U1 (NIEWALD LOTHAR [DE]) 3 July 2003 (2003-07-03) * page 6, line 23 - page 10, line 22; figures 1,3 *	1,17,18	TECHNICAL FIELDS SEARCHED (IPC) D06F
A	EP 0 648 884 A (GROSSETTI AUGUSTO [IT]) 19 April 1995 (1995-04-19) * column 2, line 18 - column 3, line 10; figures 1-5 *	1,17,18	
A	EP 1 004 698 A (VANDELANOITE PIERRE [FR]) 31 May 2000 (2000-05-31) * paragraph [0007] - paragraph [0015]; figure 1 *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 June 2009	Fachin, Fabiano

CATEGORY OF CITED DOCUMENTS

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19-06-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH 310482 A	31-10-1955	NONE	
WO 0220894 A	14-03-2002	AU 1886001 A	22-03-2002
		IT MI20001955 A1	06-03-2002
		TW 495572 B	21-07-2002
AU 2004100506 A4	23-09-2004	NONE	
WO 2008039086 A	03-04-2008	NONE	
DE 20306361 U1	03-07-2003	NONE	
EP 0648884 A	19-04-1995	IT MI930790 U1	14-04-1995
EP 1004698 A	31-05-2000	AT 277219 T	15-10-2004
		DE 69920375 D1	28-10-2004
		DE 69920375 T2	09-02-2006
		FR 2786507 A1	02-06-2000

EPO FORM P0459

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