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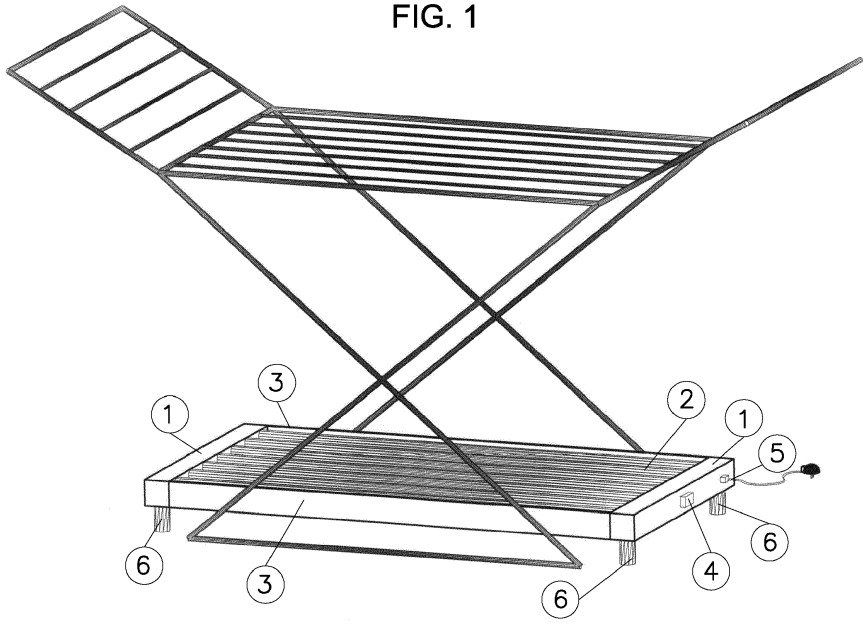
(54) PORTABLE ELECTRICAL DRYING APPARATUS FOR HANGING CLOTHING AND HOUSEHOLD LINEN

(57) Portable electrical drying apparatus for hanging clothing and household linen, that comprises a flat body, composed of two side casings (1) and two non-heating end profiles (3). The drying apparatus stands on the floor by means of fixed legs (6), in order to be located in horizontal position. The casings (1) comprise circuits, connections, a switch, a potentiometer, a timer (4), turbines and safety elements. The casings (1) are connected by heat irradiating elements, working at a predetermined temperature, which contain heating elements to be selected among resistors, fluids and air. The irradiating elements are completely moisture-tight and generate the convection process which transforms cold air from the floor into hot air, making it rise and producing a gentle heat current.

FIG. 1



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Description

OBJECT OF THE INVENTION

[0001] The following invention, as expressed in the title of the present description, refers to a portable electrical drying apparatus for hanging clothing and household linen, which acts as a supplementary accessory for all traditional drying racks, folding, movable or fixed, meant for the drying of all kinds of garments, linen and clothing.

[0002] The principle behind this invention is to dry the laundry, previously wrung and wet, which is hanging on any drying rack, using a convection heater, located in horizontal position, which generates an upward, continuous and dry hot air flow, irradiating the clothing from bottom to top and throughout the whole extension of the drying rack the user has. In this way, heat flows throughout the entire surface of the hanging clothing, thus enabling its complete drying, through evaporation, in few hours, providing said clothing with natural care at a low temperature, with neither noise nor vibrations and requiring very low power consumption.

BACKGROUND OF THE INVENTION

[0003] Clothing drying apparatuses aimed at speeding up the moisture extraction and/or evaporation process of garments have existed for a long time. However, none of them, due to their technical and physical features, size, power consumption and cost can meet this essential and regular need in a generalised manner. Furthermore, the user's dissatisfaction toward this kind of drying apparatuses sometimes leads to undesirable and dangerous alternatives, such as placing wet clothing and household linen next to sources of heat,-stoves, chimneys, radiators, convection heaters, etc.- which are not intended for this kind of uses and having sources of moisture and/or highly flammable clothing next to them.

[0004] Over the last few years, folding drying racks with heat bars, equipped with resistors, hot air, etc. have come onto the market place. Nevertheless, these types of drying racks are not efficient because they break the basic physical heat transfer principle, as "hot air disseminates upward". These drying racks have heating elements in the bars or tubes themselves, where the clothing is hung, said heat being concentrated in a very small area of the garment which is in direct contact or close to the above-mentioned bars or tubes, being ineffective in the rest of the garment, as heat always rises; therefore, this rack is only eventually used as the rest of the similar traditional ones, but is more expensive, smaller and consumes energy without the desired effect.

[0005] Likewise, there are many clothes dryers available on the market in the form of coats racks, single coat hangers, hot air turbine dryers with plastic elements composing a closed enveloping chamber with zips and other forms of closure, all of them irradiating heat; but the complexity involved in having to assemble and disassemble them for every single use, as well as their geometry which only allows to dry certain and very specific garments, do not offer us the possibility to hang the wide variety of clothing we may hang in a traditional rack, not to mention the fact that these inventions lead to a high level of power consumption, noise and nuisance.

[0006] Furthermore, the market offers household appliances, traditionally known as tumble dryers, which perform a very efficient drying function. However, because of their size, the required installation, and the related cost and power consumption, home users do not buy them much and, although they might be used, they are incompatible with several delicate garments which do not tolerate drying in this kind of appliances, people eventually resorting to traditional drying racks for drying these garments.

[0007] In conclusion, although there are numerous inventions meant for drying clothes and/or household linen, the features of those already available on the market show evident deficiencies in terms of design and effectiveness. None of these inventions offers a comfortable, economical, complete and effective solution for the fast drying of all types of clothing and household linen, which would turn it into a supplement that is useful, efficient, practical, economical, easy to transport and with low power consumption, adaptive to all traditional indoor drying racks, such as the one the present invention proposes.

DESCRIPTION OF THE INVENTION

[0008] The portable electrical drying apparatus for hanging clothing and household linen proposed in the present invention is based on the basic operation structure of a natural and/or dynamic convection radiator but its horizontal working position, flat design, insulating connections and moisture-tightness allows to solve the above-described problem and thus use it in any of the drying racks available on the market, as this portable electrical drying apparatus for hanging clothing and household linen is an accessory that may be simply and easily adapted to most of these drying racks, being set on the floor and between legs or scissor legs (of folding and movable racks), at only a few centimetres away from the hanging clothes, the same applying to drying racks fixed between two walls or suspended racks, in these cases being lifted through telescopic legs up to a few centimetres' distance from the hanging clothes.

[0009] In this way, in any of the above-mentioned cases, it is possible to accomplish the desired effect of irradiating, through natural and/or dynamic convection, the gentle flow of constant and dry heat from the bottom of the clothes to the top, from where they hang, the whole garment receiving enough heat to be dried in few hours and at a predetermined temperature, preferably low, and with low power consumption. Low temperatures in a convection drying process is considered when it lays between 10 and 60°C, preferably using in the present in-

vention working temperatures between 18 and 50°C.

[0010] This portable electrical drying apparatus for hanging clothing and household linen has fixed legs to stand on the floor which, depending on the model, may incorporate telescopic legs in order to be lifted.

[0011] Furthermore, in some models, the practical feature of being longitudinally extensible and retractable will allow for adapting it to the size of the drying rack we may have, in order to easily fold it back when we are not using it, or transport it more comfortably when we need to move, as it takes very little space.

DESCRIPTION OF THE FIGURES

[0012] To complement the description being made below, and to make it easier to better understand the features of the invention, this descriptive report is accompanied by a set of drawings in which, for illustrative and not restrictive purposes, the following has been represented.

Figure 1 shows a general perspective view of a portable electrical drying apparatus for hanging clothing and household linen, standing on the floor, in the position to operate on a conventional folding drying rack.

Figure 2 shows a plan view of the portable electrical drying apparatus for hanging clothing and household linen, with fixed or retractable fins and/or tubes and/or profiles according to the model.

Figure 3 shows a cross-sectional view of the portable electrical drying apparatus for hanging clothing and household linen showing the regular airflow, wherein the light arrows indicate cold air from the floor and the dark arrows indicate the heated air when contacting the heating fins and/or tubes and/or profiles, depending on the model, which rises toward the hanging clothes, causing an effect that resembles underfloor heating.

Figure 4 shows a longitudinal elevation view of the portable electrical drying apparatus for hanging clothing and household linen, with the telescopic legs which support the apparatus on the floor in lifted position and coupled to the fixed legs.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0013] In view of the above-described figures and according to the numbering provided, it should be noted that Figure 1 shows the invention in operating position, standing on the floor on fixed legs, underneath a conventional drying rack from where the wet clothes will hang for drying.

Figure 1 shows the elements composing the invention, made up of two casings (1) made of light, insulating and resistant material, their internal and external connections with the different elements the user is to handle to use the portable electrical drying apparatus being completely moisture-tight. Casings (1) house all the circuits, connections, turbines and safety elements necessary for the proper operation of the resistors and/or fluids and/or air that heat the fins and/or tubes and/or profiles (2).

Figure 2 depicts casings (1) together with non-heating profiles (3) which make up the essential and assembled body of the invention, to longitudinally house heating fins and/or tubes and/or profiles (2). Said fins and/or tubes and/or profiles (2), which are made of highly heat conductive material, contain resistors and/or fluid and/or air that will heat them and which, due to their geometry, may be placed in a large number, thus enhancing proportion between size and the widest area in contact with the cold air coming from the floor, to obtain more hot air and at a higher speed with lower power consumption, as shown in Figure 3.

[0014] Output connection to the mains from casings (1) is performed through a cable and related plug (5), and the switch and/or potentiometer and/or timer (4) to connect and disconnect the apparatus are also attached to said casings (1). Furthermore, the four legs (6) are coupled to the bottom of the casings (1) for standing on the floor, which enable the attachment of telescopic legs (7) to lift the apparatus, as shown in Figure 4.

Claims

1. Portable electrical drying apparatus for hanging clothing and household linen, **characterised in that** it comprises a flat body, composed of two side casings (1) and two non-heating end profiles (3), which stands on the floor by means of fixed legs (6), in order to be located in horizontal position, wherein the above-mentioned casings (1) comprise circuits, connections, a switch, a potentiometer, a timer (4), turbines and safety elements, the casings (1) being connected by heat irradiating elements, working at a predetermined temperature, which contain heating elements to be selected among resistors, fluids and air, the irradiating elements being completely moisture-tight and generating the convection process which transforms cold air from the floor into hot air, making it rise and producing a gentle heat current.

2. Portable electrical drying apparatus for hanging clothing and household linen, according to claim 1, **characterised in that** the heat irradiating elements are selected among fins, tubes and profiles (2).

3. Portable electrical drying apparatus for hanging

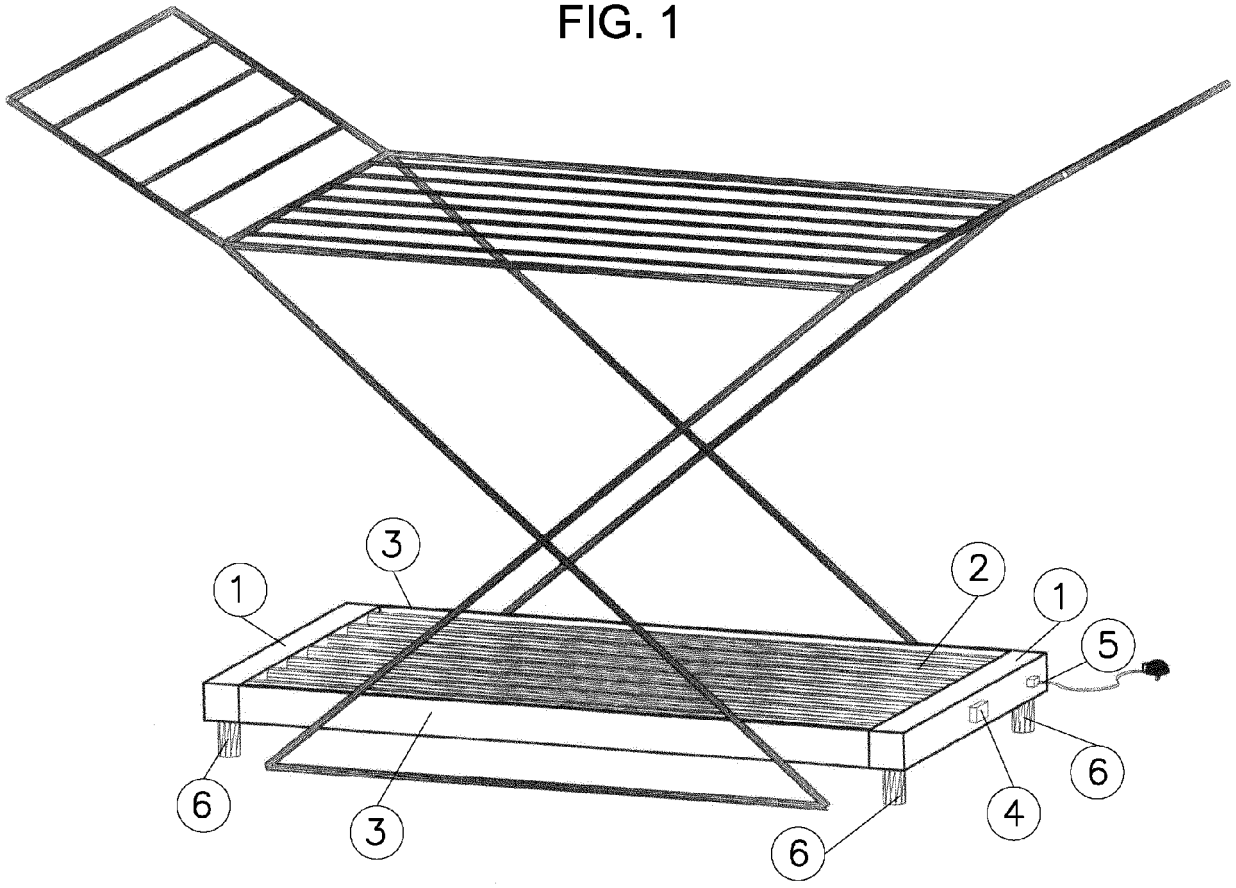
clothing and household linen, according to claim 2, **characterised in that** the heat irradiating elements work at temperatures between 18 and 50°C.

4. Portable electrical drying apparatus for hanging clothing and household linen, according to claims 2 or 3, **characterised in that** the heat irradiating elements are fixed.

5. Portable electrical drying apparatus for hanging clothing and household linen, according to claims 2 or 3, **characterised in that** the heat irradiating elements are extensible and retractable.

6. Portable electrical drying apparatus for hanging clothing and household linen, according to claim 1, **characterised in that** it comprises telescopic legs (7) attachable to the fixed legs (6) for the regulation in height of the drying apparatus.

FIG. 1



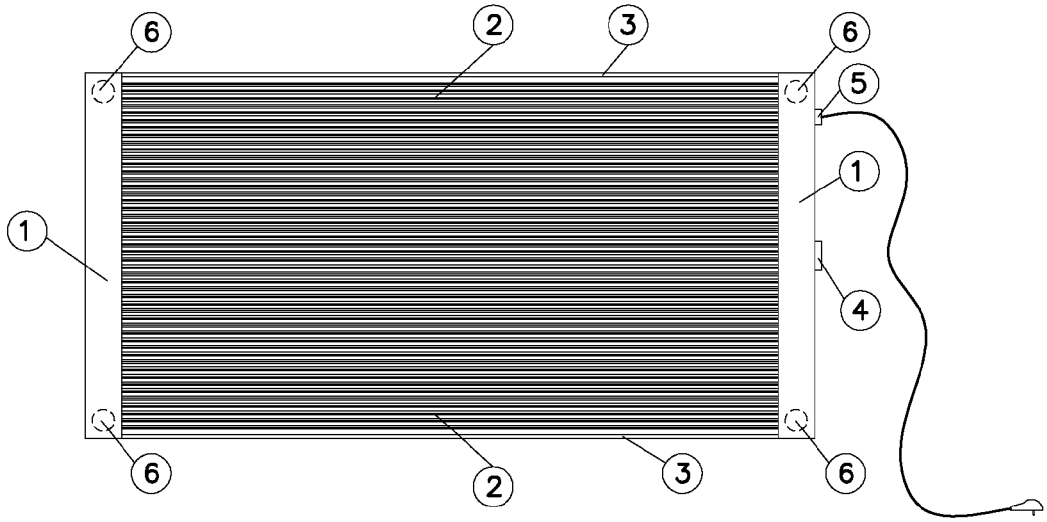


FIG. 2

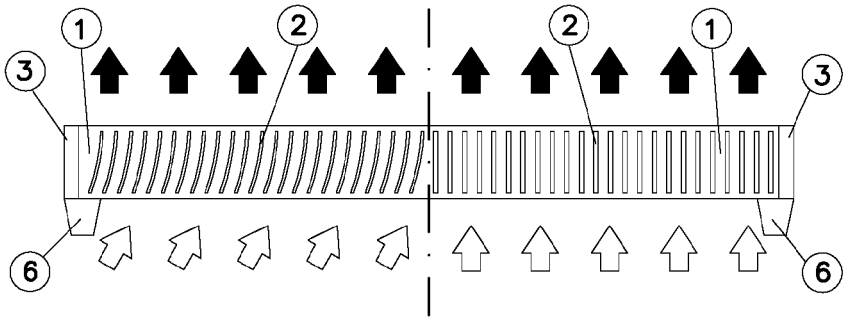


FIG. 3

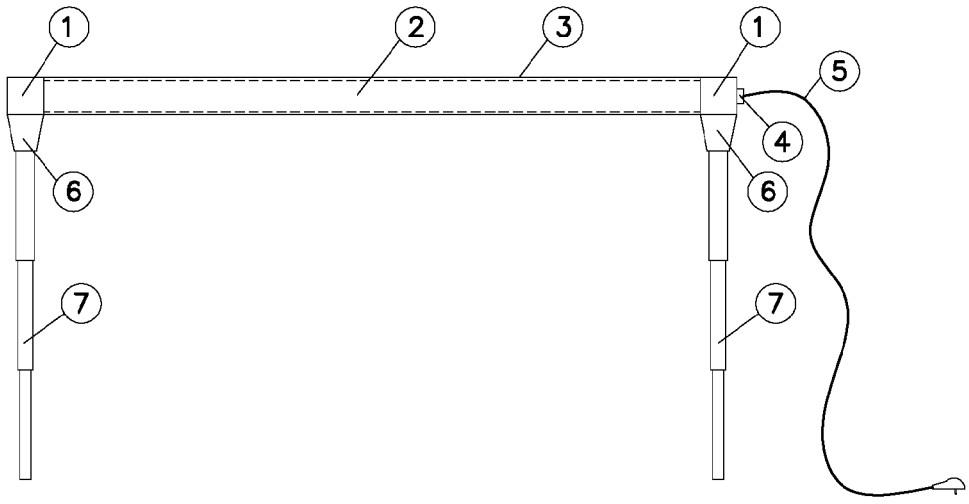


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 16 15 5218

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	GB 806 546 A (ELISABETH DOREEN SVENDSEN) 31 December 1958 (1958-12-31) * the whole document *	1-6	INV. D06F58/00 D06F57/08
A	DE 20 2014 005681 U1 (IHRIG KARL RAINER [DE]) 6 August 2014 (2014-08-06) * paragraphs [0004] - [0009]; figure 1 *	1-6	
A	US 6 153 862 A (JOB DONALD D [US]) 28 November 2000 (2000-11-28) * column 3, paragraph 39-53; figures 3,7 * * column 5, lines 19-40 *	1-6	
A	US 2010/199513 A1 (SANDERS THOMAS [US]) 12 August 2010 (2010-08-12) * paragraphs [0039] - [0042] *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC) D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 July 2016	Stroppa, Giovanni

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 15 5218

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
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07-07-2016

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