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I-20129 Milano(IT)(54) **Conical shaped high performance electric resistance for hair driers and similar appliances.**

(57) An electric resistance wound as a spiral conical helix is described, giving an uniform wire surface in contact with the air, since it is fixed to a fundamentally conical support, consisting of a certain number of stepped laminations, with self-centring point, the resistance wire being preferably shaped as a dense wave, so as to produce uniform heating of the air with simultaneous reduction of the size of the resistance.

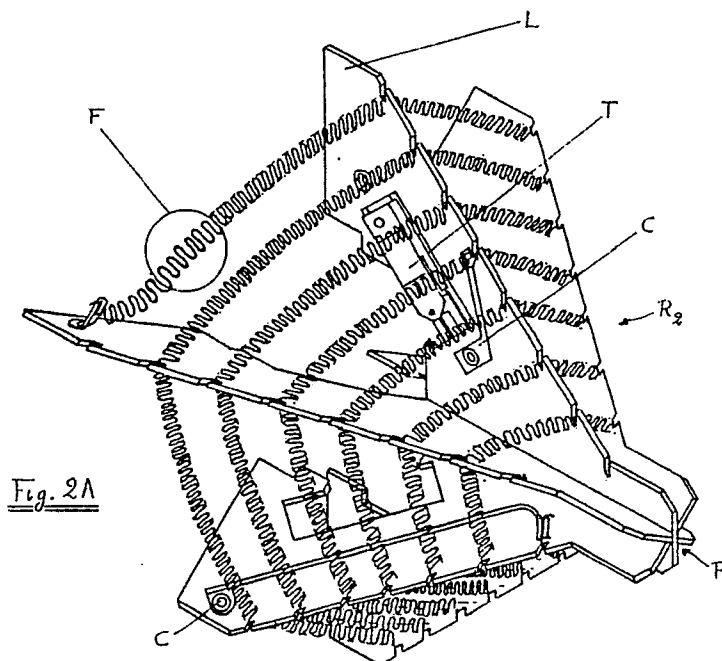


Fig. 2A

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"CONICAL SHAPED HIGH PERFORMANCE ELECTRIC RESISTANCE FOR HAIR DRIERS AND SIMILAR APPLIANCES"

This invention relates to an electrical resistance for hair driers and similar appliances, presenting technical features which are most advantageous both from the constructional point of view and from those of performance and output.

In the majority of hair driers produced today the heating element (resistance) has a cylindrical shape; more precisely it comprises the heating filament shaped in spiral or wave form, which is wound in aligned turns around an insulated core.

During operation the resistance is hit longitudinally by the air flow and, as may be seen from figure 1A which shows current technology, not all the air passes through the resistance and the first coils are amply cooled by fresh air, while the following ones are covered by these former and are partially hit by air that is already hot.

This unequal heat dissipation compels to make the resistance with an oversized heating wire; this causes a greater obstacle to the air flow and overheating of the wire in proximity with the air outlet, and the grille of the appliance reaches high temperatures at those points close to the wire.

With the conical resistance of this invention these defects are well resolved thanks to the uniform arrangement of the heating wire.

As can be seen in figure 1B, illustrating the working method of the resistance subject of this invention, the conical shape allows all the wires comprising the resistance to be exposed to air that is equally cold, and to cover the whole of the air outlet section of the appliance, thus preventing cold air from emerging without having been heated and, furthermore, being very short, avoids shadows and eddies due to the rotation of the air flow within the appliance.

This type of conical resistance of this invention allows full exploitation of the properties of the heating wire, which here is shaped as a very dense wave in order to further improve uniform heating of the air as well as achieving a very reduced size relative to traditional types of equal power.

As a result the air emerging from the appliance has an uniform temperature at all points; for this reason there is no need for grilles that are particularly resistant to high temperatures.

In the models of hair drier fitted with cold air buttons, power to the resistance is temporarily cut off, thus obtaining cold or tepid air; but by using the button not all this is obtained immediately, since the mass of the wire still gives out heat for a certain time, proportional to the mass itself. With the conical resistance this time is greatly shortened, since wire of a lesser mass has been used.

The objects, features and advantages of the electric resistance subject of this invention are further evidenced by the following detailed description of one of its preferred embodiments, given only as an example and in no way limiting the scope of the invention, making reference to the attached figures of illustrative drawings, in which:

Figure 1A is a functional diagram of a hair drying appliance with a traditional resistance;

Figure 1B is a similar functional diagram of an appliance including a resistance subject of this invention;

Figure 2A is a perspective view of the said resistance; and

Figure 2B is a plan view of one of the laminations that constitute the support for the said resistance.

With reference first to Figure 1A, as has already been stated it shows a hair drying appliance D fitted with a fan V and a resistance R_1 of the traditional type.

Since the coils of this resistance are arranged in line on the support, a central zone of air A_0 is generated which is not heated by the wire and, viceversa, a zone R_{max} of overheating of the wire close to the air outlet.

Let the situation now be considered of using the conical resistance R_2 subject of this invention, as illustrated in Figure 1B. Since all the lines of air flow meet at least one coil of the resistance wire, an output air flow A_{tu} is generated at an uniform temperature and furthermore there is no area of the wire subject to overheating.

Going on to examine Figures 2A and 2B the conical resistance R_2 subject of this invention is described in greater detail. It consists of the wire F preferably shaped as a wave or, if desired, as a spiral, although the wave form is, without a doubt, the most advantageous, wound as a helix onto an insulated support of basically conical shape and composed of a certain number of laminations L of an insulating material such as mica, of a more or less triangular shape, stepped with notches for mounting the wire which all tend towards the self-centring point P to facilitate its fitting to the appliance.

It should be noted that the wire is shaped as a dense wave, suitable for pressure fitting to the insulated support, so as to avoid the wire unwinding or moving should the wire itself break. Thus a spiral conical helix winding is obtained, which presents an uniform surface of wire to the incoming air, and thus an uniform heating both of all the the

air passing through the appliance and of all the resistance wire.

Finally, the device is fitted with the temperature limiting thermostat T and the connections C, but it should be understood that both the thermostat and the several connections can be located in different positions, depending on the appliances to which the resistance is fitted.

From the above detailed description it is thus clear that the conical resistance subject of this invention fully achieves the established objectives, but the fact should also be highly stressed that numerous variations, modifications, additions and/or substitutions of elements may be made to the elements of the discovery without, in this way, deviating either from its spirit or its object and without even departing from its scope of protection, as is also defined in the appended claims.

Claims

1. Electric resistance for hair driers and similar appliances, characterised in that the winding of its resistance wire is in the shape of a spiral conical helix, which gives an uniform wire surface in contact with the air.

2. Electric resistance according to claim 1, characterised in that the conical winding is obtained by winding the wire on a fundamentally cone shaped insulated support.

3. Electric resistance according to claim 2, characterised in that the insulating support is composed of a certain number of laminations of a fundamentally stepped triangular shape, with notches for fixing the wire, the said laminations all converging and uniting at the point of support.

4. Electric resistance according to claim 3, characterised in that said insulated point of support is self-centring to facilitate fitting to the appliance.

5. Electric resistance according to one or more of the preceding claims, characterised in that the resistance wire is shaped in a dense wave, adapted to be fixed to the insulated support by pressure, to avoid the wire unwinding or moving in the case of said wire breaking.

6. Electric resistance according to one or more of the preceding claims, characterised in that on the support are fitted the temperature limiting thermostat as well as the power connections, in different positions according to the type of appliance.

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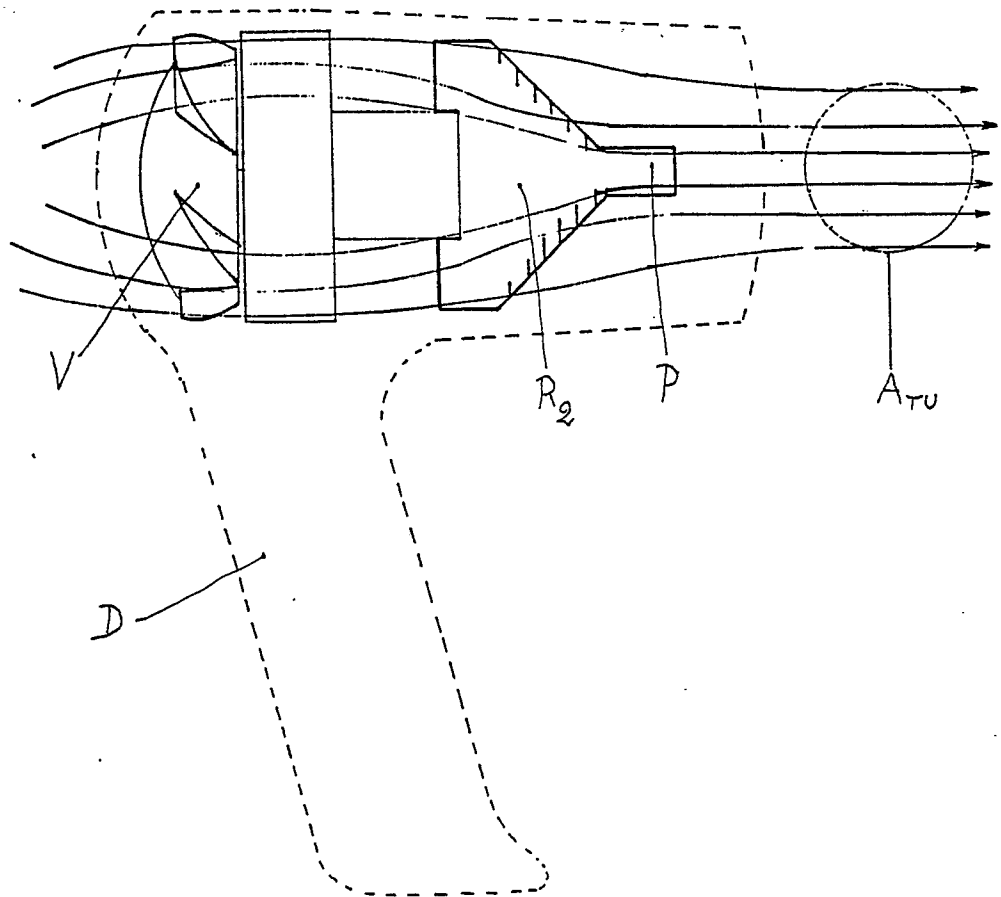
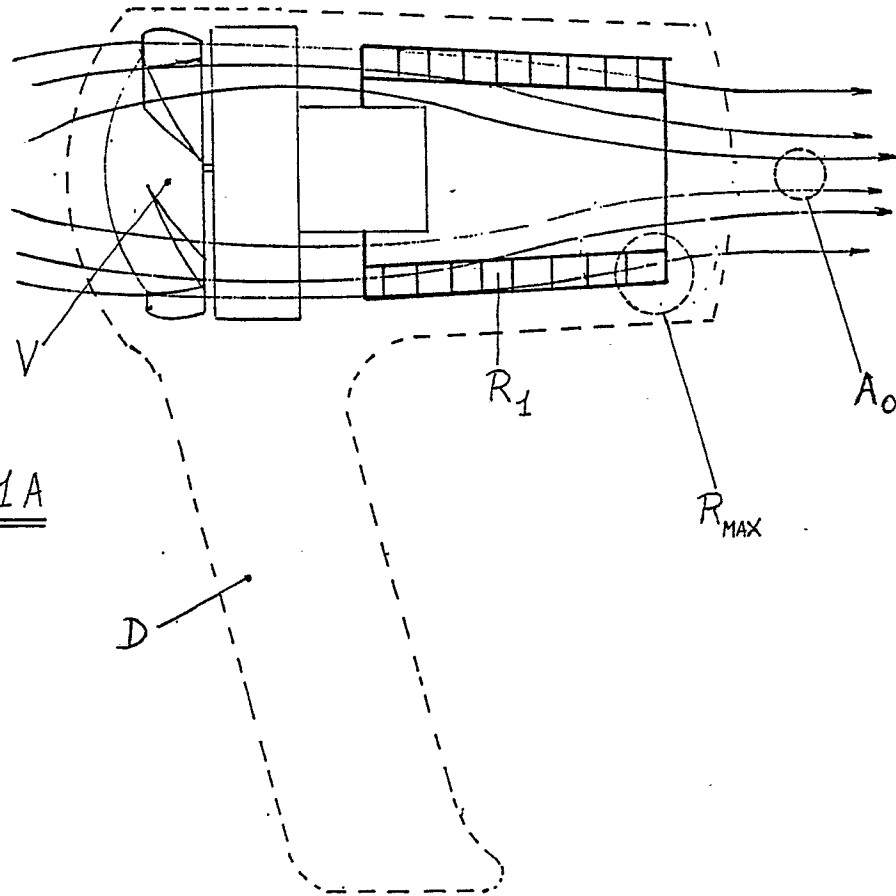
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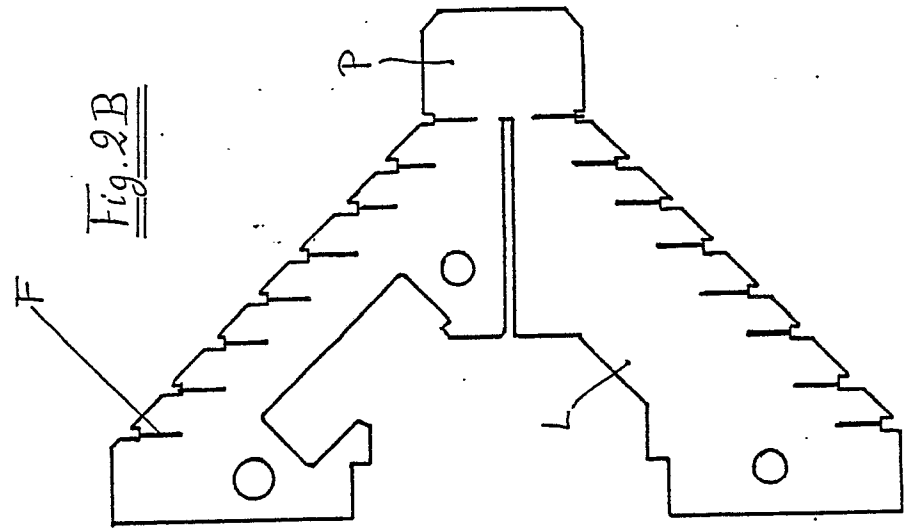
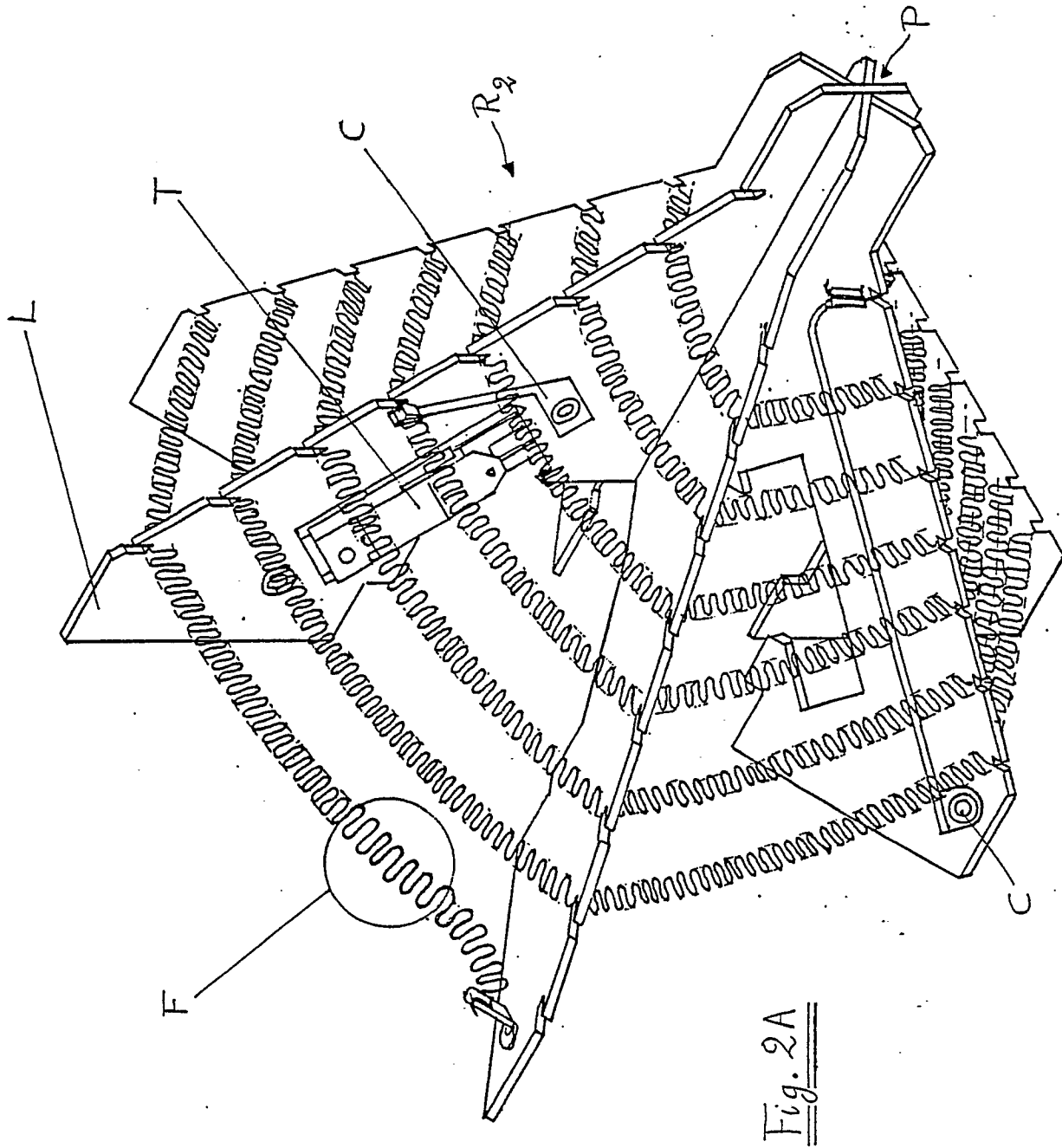
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EUROPEAN SEARCH REPORT

Application Number

EP 89 20 0701

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.4)
X	DE-A-2727940 (SPERRY RAND CORP.) * page 8, line 24 - page 11, line 22; figures 2, 7 *	1-6	H05B3/16
X	FR-A-2366769 (FIRMA FRITZ EICHENAUER) * page 5, line 21 - page 6, line 3; figures 9, 10 *	1-3, 5, 6	
X	US-A-1468593 (EDMUND M. ERB) * page 2, line 5 - line 58; figures 1-3 *	1-3	
X	EP-A-219916 (NORTH AMERICAN PHILIPS CORPORATION) * page 12, line 7 - page 13, line 2; figures 5, 8, 10 *	1-3, 5, 6	
P,X	EP-A-293997 (GAMMA S.P.A.) * column 2, line 12 - line 49; figures 1, 2 *	1-3, 5	
A	US-A-2298315 (DAVID T. SIEGEL)		
A	EP-A-038414 (BRAUN AKTIENGESELLSCHAFT)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			H05B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 MAY 1989	Examiner RAUSCH R.G.
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			