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(54) Dehumidifying device for hearing aids

(57) Nevertheless, it must be understood that the invention has been described following a preferred manner of implementation, which means that it may be subject to modifications without that involving any alterations to the fundamentals of the invention, even though such modifications might affect, in particular, the shape, size and/or materials used in the manufacture of the unit, in the interests of achieving a performance behaviour in accordance with the objectives pursued.

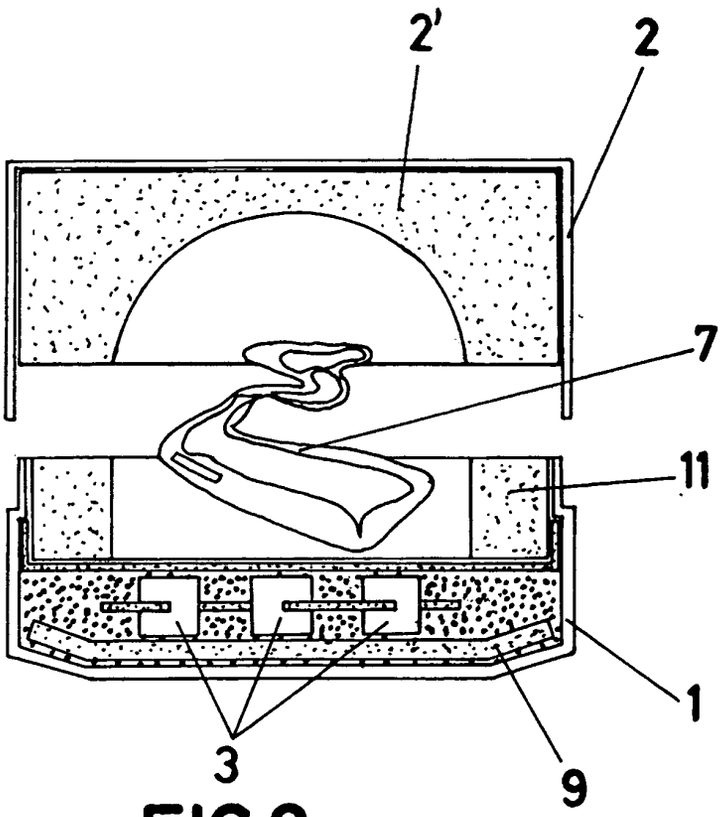

FIG.2

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Description

Aim of the invention

[0001] This invention is a dehumidifying device for hearing aids and similar apparatuses, contributing essential new features that offer marked advantages when compared to the methods familiarly employed for the same purposes in this technical field today.

[0002] But, in particular, the invention sets out to develop a device that provides a housing for hearing aids, or similar apparatuses, in which optimum temperature conditions are maintained so as to eliminate any damp that might possibly come to affect them, thus ensuring that these apparatuses are kept under the best operational conditions for the user. The device, which is basically built in a box form, incorporates an electrical heating system, either to be directly fed from the mains supply or for use with any other energy source, whilst it also incorporates means for the regulation of the temperature, in order to keep it at whatever level is considered to be the most suitable for the particular kind of device that is being used.

[0003] The field of application covered by this invention falls within the industrial sector, in areas generally dedicated to the manufacture of devices and methods for maintaining and storing orthopaedic and similar material.

Background and summary

[0004] People with hearing difficulties often use apparatuses which, housed in one or both ears, allow auditory signals to be amplified, thus enabling the user to attain an increased level of hearing that, so far as is possible, compensates for the physical defect from which they suffer.

[0005] Over time, there has been significant progress in the manufacture of hearing aids so that today, thanks to the miniaturisation of electronic devices, there has been a considerable reduction in their size, while, at the same time, there has been a simultaneous improvement in performance. Nevertheless, due to the high degree of sensitivity of the electronic systems employed within these devices, their users need to have ways of storing them in the most favourable conditions possible to ensure they work properly. Of all the factors that may affect the performance of a hearing aid, damp produces particularly negative effects, as it is able to damage an apparatus by causing its components to rust, thus producing short circuits or noise or actually leading to the deprogramming of the digital circuits that are built into the apparatus.

[0006] Since the cost of this kind of apparatus generally tends to be appreciable, it is of vital importance to prevent, where possible, the risk factors that might become the agents of possible damage.

[0007] Taking the aforementioned problems into consideration, the fundamental objective of this invention is to provide effective answers to solve the problematic that has been described.

[0008] The objective has been successfully addressed by means of the device described below. It consists of a box-shaped housing designed to contain the hearing aid and keep it under temperature conditions that will prevent the accumulation and/or condensation of damp, whilst, at the same time, the temperature is maintained below a threshold level that is predetermined to ensure that the electronic circuits built into the apparatus cannot be adversely affected.

[0009] To this end, the housing for the apparatus, which, as has been said, is box-shaped, includes a cavity within which the apparatus is placed. The base of the cavity has multiple perforations, thus creating holes for the hot air to pass through, while underneath the base there is provision for the incorporation of heating elements, which generally consist of a set of electrical resistors that can be fed with alternating current through connection to the mains via a suitable cable, while, in alternative versions, the resistors could be supplied with continuous current, via batteries, a power supply, solar cells, or any other device equipped to provide the power necessary to generate the right amount of heat to maintain the apparatus at a temperature guaranteed to keep it damp free. As indicated above, the unit also incorporates a system to control the temperature and maintain it at the right level, within predetermined limits, for which purpose provision has been made for some kind of mechanical, electrical, electronic or I.T.-based sensor, such as a thermostat or similar device, as well as the optional installation of a small ventilator that could be activated in the event of the temperature surpassing the predetermined threshold level.

Brief Description of the Diagrams

[0010] Both the aforementioned characteristics, as well as other features and advantages of the invention, can be more clearly perceived in the detailed description below showing the preferred form of implementation, provided solely as an illustrative and not restrictive example, in relation to the accompanying diagrams, in which:

Figure 1 shows a perspective view of a device in box shape, as in the invention, and

Figure 2 provides an outline view of a section performed on the device in Figure 1.

Description of preferred form of implementation

[0011] In accordance with the foregoing, the detailed explanation of the preferred form of implementation of the invention is provided with the help of the diagrams attached, in which the same numerical references are

used to designate equal or similar parts.

[0012] If we turn to Figure 1 of the diagrams, we observe a perspective representation of a box which, as a unit, constitutes the material invention, and is preferably built from malleable material, e.g. suitable plastic material, lined inside with heat-insulating material designed to guarantee that the temperature within is kept at the desired level. The box is made up of a lower body 1 and an upper body 2 or lid, both of which are hinged together along one of their edges, as is customary. The inside lining, in relation to each of the aforementioned bodies, is indicated in the diagram using references 1' and 2', respectively, and is configured in such a way that, in regard to the lower body 1, at least, a central cavity 3 has been formed, affecting a substantial area of the surface, delimited below by a base wall in which a large number of through holes 4 have been bored. In the space below the base of the cavity 3, the heat-generating elements for reaching the working temperature desired are housed, in addition to the sensor and temperature control elements mentioned above. In the implementation example that appears in the representation of Figure 1, the unit is complemented by a cable and plug 5 for connection to the electrical network or other power source, as well as a pilot 6, which indicates whether the device is connected or disconnected, according to whether it is turned on or off, and which in this diagram is located on the front wall of the lower body 1 of the box, but which, logically, might be located in any other suitable position.

[0013] As can be appreciated in the representation, the peripheral lid wall of body 2 has been projected along the perimeter so that it can be attached to the corresponding part of the lower body 1. In this way an appropriate hermetic fit between both bodies is guaranteed, the aim being to keep the internal temperature constantly at the desired level.

[0014] If we now turn to the representation in Figure 2, we can observe that there is an outline view of the whole invention in its operational state, that is to say, with a hearing aid 7 enclosed in the cavity 3 formed by the heat-insulating lining of both bodies 1 and 2, and consequently in an appropriate position to take in heat through the holes 4 that are to be found at the base of the cavity 3. In this other Figure we also see the representation of the heating elements 8, situated on the support 9, made of insulating material, which the body 1 is provided with at its base wall. As for its heating elements 8 they are connected to the electronic elements and devices whose task is to detect the temperature level and if necessary cut off the supply once the operational temperature has been reached, as well as to connect the auxiliary ventilation system, if necessary, should the temperature threshold be exceeded. These electronic elements have not been represented or described in greater detail, as they are actually well known and quite customary within current technical practice.

[0015] Naturally, with a device such as that advocated by the invention, both simple and easy to construct, we succeed in keeping the hearing aid 7 in perfect use conditions via the controlled application of a certain amount of heat to maintain it at a suitable storage temperature, the apparatus consequently remaining free of any risk of damage due to the accumulation of damp inside.

[0016] On the other hand, as experts in the field will also understand, although the invention has been described in terms of a very specific application in the case of hearing aids, its very principles happen to be perfectly applicable to any other sector in which it is necessary to keep any kind of apparatus within damp-free conditions.

[0017] We do not consider it necessary to detail further the content of this description in order for experts in the field to be able to understand its reach and the advantages deriving from the invention, as well as to develop and put to practical effect the subject described.

Claims

1. Dehumidifying device for hearing aids or similar apparatuses, for their maintenance in damp and condensation free conditions and in avoidance of the risks deriving from such accumulation, being **characterised by** the box shape it adopts in its preferred form of implementation, consisting essentially of a lower body (1) and an upper body (2), the former joined in a hinged manner to the upper body in lid form, both bodies (1, 2) lined inside with heat-insulating material (1' , 2'), so that at least one of the bodies, preferably the lower body (1), has formed a cavity (3) designed to house the apparatus (7), this cavity delimited in its lower part by a base wall in which a multiplicity of thoroughfare holes (4) have been bored, under whose base the device has a set of heating elements incorporated, consisting of a group of resistors (8) fed electrically from the mains or any other appropriate power source, joined to components acting as sensors and to control the heat generated, the purpose being to keep the inside temperature at a level that is sufficient to prevent the accumulation of damp in the apparatus under protection, whilst it remains at the same time below a predetermined threshold to prevent possible damage to the electronic devices built into the hearing aid.

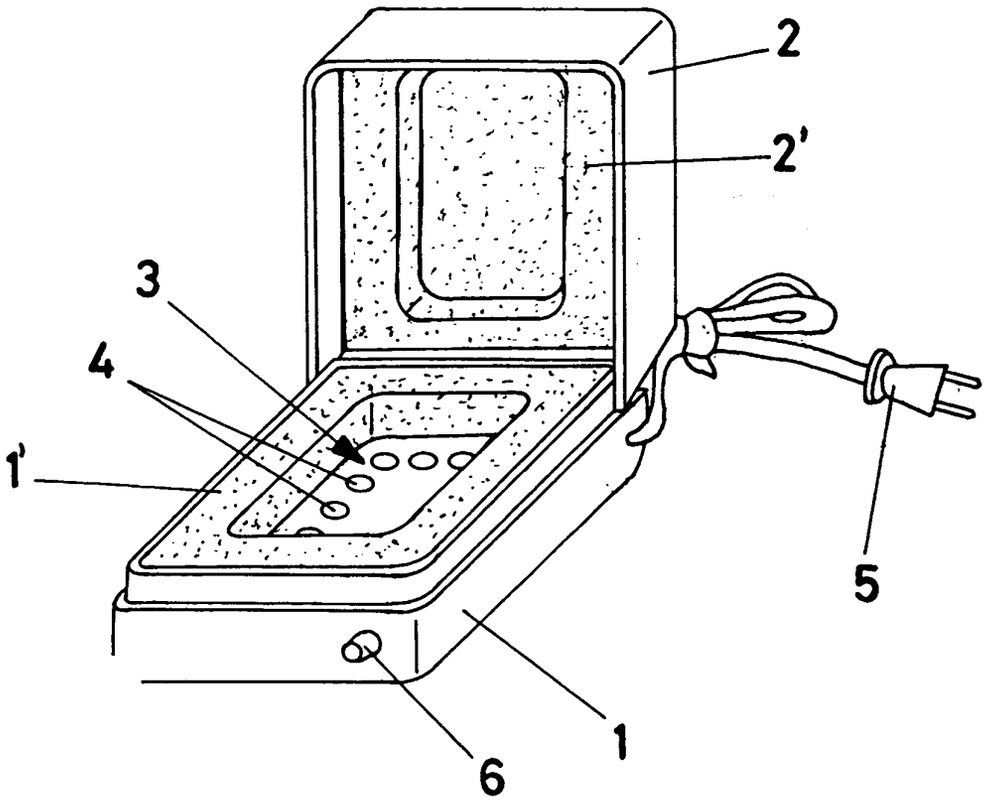

FIG.1

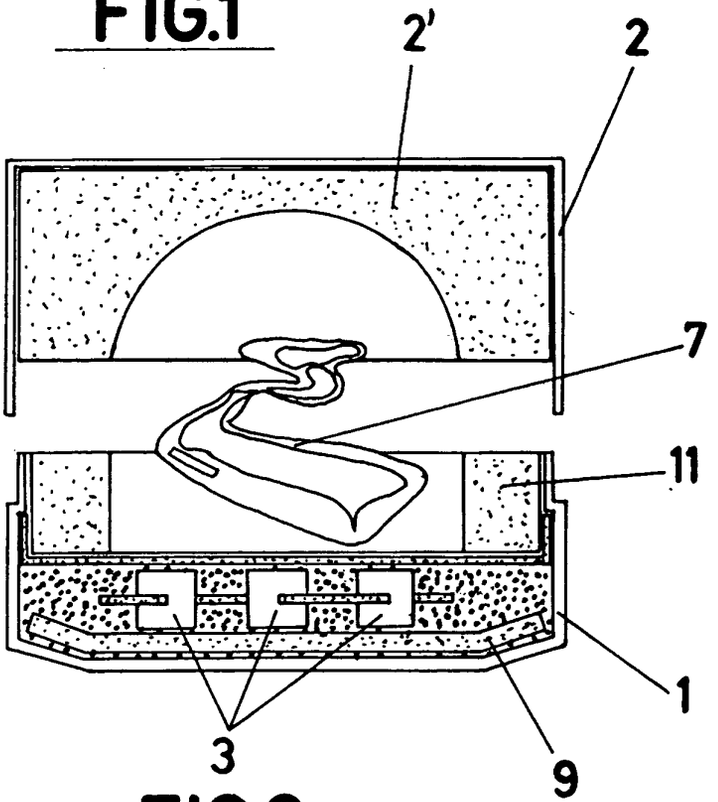

FIG.2