Sept. 11, 1962 H. A. FRENCH 3,053,061

CLAMPLESS EAR-FITTING SUPPORT FOR AN EAR ADORNMENT

Filed Oct. 27, 1958

FIG_1

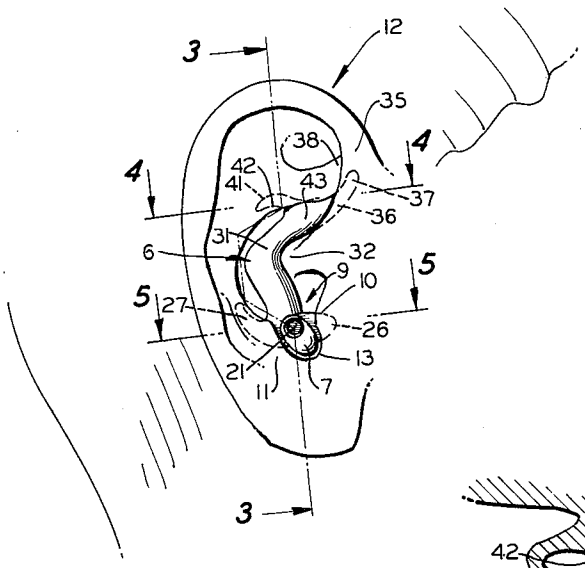


FIG_2

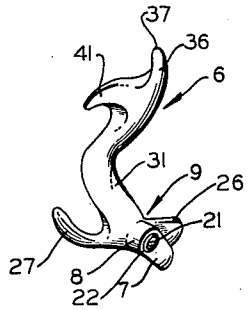
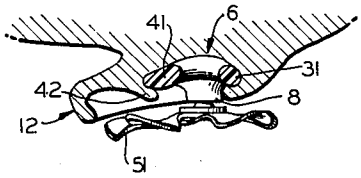


FIG_4



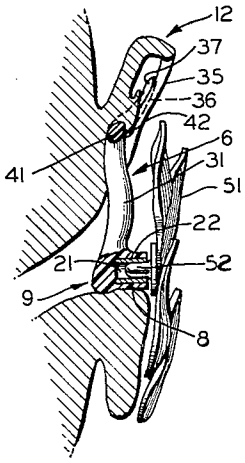


FIG_3

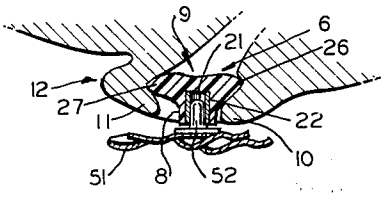


FIG_5

INVENTOR.
HARRY A. FRENCH

BY

Lothrop & West
ATTORNEYS

United States Patent Office

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CLAMPLESS EAR-FITTING SUPPORT FOR AN EAR ADORNMENT

Harry A. French, Sacramento, Calif.
(629 Sutter St., San Francisco, Calif.)

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The invention relates to inserts which are individually molded and sculptured to fit into the ears of the user, the inserts being utilized as supports for a variety of ear adornments attachable to and detachable from said inserts.

It is an object of the invention to provide an insert which is carefully made to conform to the auricle members of the wearer and which can therefore be worn with a high degree of safety and comfort.

It is another object of the invention to provide an auricle insert which is barely, if at all, visible to an observer.

It is still another object of the invention to provide an outer ear insert which does not extend into or cover the user's ear canal and which, therefore, does not interfere with hearing.

It is yet another object of the invention to provide an insert having carefully sculptured projections which are adapted to be fitted into various cavities in the auricle of the user in such a manner as to lend substantial firmness and rigidity to the insert and to the adornment attached thereto.

It is a further object of the invention to provide an insert in which the adornment can be attached in such a fashion as to be disposed parallel to the plane of the outer ear and at a location well up on the ear.

It is yet a further object of the invention to provide an insert in which the adornment can be set at will at any angular position preferred and, within limits, at any desired distance from the plane of the outer ear.

It is still a further object of the invention to provide an auricle insert which is relatively inexpensive yet durable, and which is easily insertable in and removable from the user's ear.

It is another object of the invention to provide a generally improved support for an ear adornment and method of making same.

Other objects, together with the foregoing, are attained in the embodiment described in the following description and shown in the accompanying drawing in which:

FIGURE 1 is a side view of the support in a customary environment; namely, in the auricle or outer ear of a user;

FIGURE 2 is a front perspective of the insert;

FIGURE 3 is a section, the plane of section being indicated by the line 3—3 in FIGURE 1, a typical adornment or earring also being shown;

FIGURE 4 is a section, the plane of section being indicated by the line 4—4 in FIGURE 1, an earring also being shown; and

FIGURE 5 is a section, the plane of section being indicated by the line 5—5 in FIGURE 1, a typical adornment also being shown.

While the insert is susceptible of numerous physical embodiments, depending upon the environment and requirements of use, substantial numbers of the herein shown and described embodiment, manufactured substantially in accordance with the herein described method, have been made and used and all have performed in an eminently satisfactory manner.

The insert of the invention, generally characterized by the numeral **6**, is the end product of a molding and sculpturing process wherein the device is carefully configured to fit the ears of the wearer of the insert, one being made

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for each ear since even on the same person the left ear configurations usually vary somewhat from those of the right ear.

An impression is first taken of each of the auricles, or generally external ear portions, a plastic material such as "Resitone" of putty-like consistency being carefully inserted in the ears and removed therefrom after hardening of the material.

The several points of retention, to be described subsequently, are then built up somewhat by adding to the impression at the points of retention a thin coating of conventional dental sticky wax, as by a spatula. This step builds up the impression so as to yield a tight fit in the completed insert at the various retention points.

The built-up impression is thereupon lightly dipped in any hard-finish plastic to give a thin coating and allowed to dry.

Then, the built-up and coated impression is immersed in a fairly thick algaenate type of investment material disposed in a pan. Care must be used at this juncture to locate the impressions in such a way that when the algaenate material has hardened to its ultimate "stiff jelly" consistency, and the impressions have been removed (the yielding nature of the material permitting this to be done without breaking the mold), the investment will provide a pair of indented or female molds carefully related to the planar surface of the algaenate material. The planar surface of the mold corresponds to the plane of the outer ear; that is to say, the plane defined by a stiff piece of paper, for example, lightly urged against one's outer ear. The indented mold portion must be so located with respect to the planar surface of the mold as to assume the same relationship as the indented portion of the user's ear bears to the plane of the user's outer ear. Stated in another way, the normal or perpendicular axis of the user's ear (the axis at right angles to the plane of the outer ear) must be duplicated by similarly locating the female mold with respect to the planar surface portion of the completed investment.

Having performed this step, a mold is obtained having the actual appearance and flexibility of the wearer's ears.

Casts are then made using cold flesh-colored acrylic resin, the castings being cured while still in the mold by heating in an autoclave for about twenty-five minutes, at thirty p.s.i. and approximately 115° F.

The casting is thereupon trimmed so that the surface **7** of the key **8**, or projection, on the lower portion **9** of the device (see FIGURE 2) is approximately level or at grade with the outer surface of the tragus **10** and the antitragus **11** of the auricle **12** (see FIGURE 1). This enables the key **8** to extend outwardly through the gap provided by the incisura intertragica **13** and to terminate at approximately the plane of the outer ear as can be seen most clearly in FIGURE 3.

The center of the key **8** is then drilled to form a cavity **21** within which is permanently disposed a sleeve **22**, care being exercised that the axis of the drilled cavity **21** and the sleeve **22** is at right angles to the plane of the ear. It is during drilling that the care previously taken in locating the impression in the mold at right angles to the mold surface becomes important since it is only necessary in preparing to drill to relocate or re-insert the casting in the female mold and drill vertically into the key with the pan containing the investment supported on a horizontal surface.

After the sleeve **22** is inserted, the casting is removed and hand carved on a grinding wheel to remove excess bulk, leaving, however, the main points of suspension. The main points of suspension include the lower or base portion **9** which includes a forwardly extending arm **26**, which is inserted behind the tragus **10**, and a rearwardly

and upwardly extending arm **27** which is inserted in a space known as the sulcus auriculae posterior located in back of or behind the antitragus **11**. Another important constructional feature is a generally vertical, sinuous center portion **31** which is carefully sculptured, as by grinding, to fit smoothly over the lower end of the crus helicis **32**. Adjacent the upper end of the sinuous portion **31** the device branches, a forward and upward branch **36** continuing the same general curve of the sinuous portion **31** and fitting snugly under the upper and forward portion of the crus helicis **32** and behind, or under, the forwardmost portion of the upper curve of the helix **35**, the tip of the arm **37** being adjacent the forward portion of the crura antihelicis **38**. A second branch **41** extends rearwardly and downwardly and fits snugly in the cavity underlying the central portion **42** of the crura antihelicis, the juncture between the forward arm **36** and the rearward arm **41** substantially filling the location known as the cymba conchae **43**.

It is to be noted very carefully that a substantial amount of material is sculptured away from the lower portion **9** of the casting, removal being effected above the top of the forward lower arm **26** so as to provide a clear, free passageway to the user's ear canal. This feature is especially distinguishable from the technique in cast hearing aid devices wherein the casting extends well into the ear channel, the extension being hollow to provide a conduit for sound waves.

The adornment **51** shown in the drawing is but one of numerous designs available for use. Each includes a split hollow pin **52** mounted perpendicularly to the substantially planar configuration of the ear decoration **51**. The inner end of the pin is rounded to permit its easy insertion in the sleeve **22**. Friction holds the pin snugly within the sleeve. However, the user is able to rotate the adornment to the desired angle most becoming with the particular design. Furthermore, the pin can be moved in or out until the inner surface of the decoration can be urged against the adjacent ear members to the desired degree of engagement, or if desired, can be left spaced somewhat from the ear, as appears in FIGURE 3.

Preferably, the pin is mounted on a disk, the disk in turn being secured by an appropriate plastic adhesive to the adornment. Piercing the disk is a plurality of apertures (not shown) into which the adhesive can flow, thus greatly augmenting the holding effort between the disk and the adornment. The adhesive is chosen so that while it secures the disk very firmly to any desired location, it can, if desired, be softened or dissolved by an appropriate solvent so as to permit its relocation to some other point on the adornment if desired by the wearer.

It can therefore be seen that I have provided a device

which is not only comfortable and safe but which also enables the user to achieve a flexibility of use not possible with any of the supports heretofore proposed.

What is claimed is:

1. A support for an ear adornment comprising a flesh-colored body individually molded and sculptured to fit predetermined portions of the user's auricle, said body including: a single substantially vertical member having its central portion curved slightly outwardly and rearwardly to overlie and snugly contact the posterior portion of the crus helicis; an upper member having a forward arm adapted to fit snugly into the auricular cavity formed by the crus helicis, the crura antihelicis and the adjacent portion of the helix, said upper member also having a rearwardly extending arm adapted to fit snugly in the cavity in the posterior portion of the cymba conchae; and a lower member having a forward arm adapted to underlie the tragus and a rearward arm extending into the sulcus auriculae posterior, said forward arm of said lower member and the adjacent portion of said vertical member being molded and sculptured to define with the adjacent surface of the auricle an open substantially uninterrupted passageway to the user's ear canal, the lower surface of said lower member being downwardly convex whereby to engage the wearer's ear over a substantial and continuous surface area and thereby support the weight of said device with a minimum of discomfort.

2. The device of claim 1 further characterized by a sleeve-shaped projection extending outwardly from the central portion of said lower member and adapted to project through the user's incisura intertragica and terminating in a plane which is substantially coplanar with the plane including the outermost portions of the user's auricle.

3. The device of claim 1 wherein the outermost and innermost portions of said insert are respectively located inside an outer plane substantially defining the outermost portions of the user's auricle and outside an inner plane substantially defined by the inner portions of the cymba conchae and the sulcus auriculae posterior.

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