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3,432,861

EAR PROTECTOR

Filed Aug. 9, 1966

FIG. 1

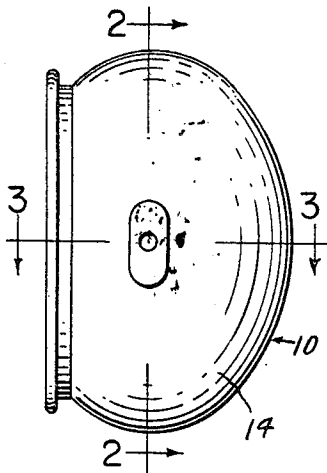


FIG. 2

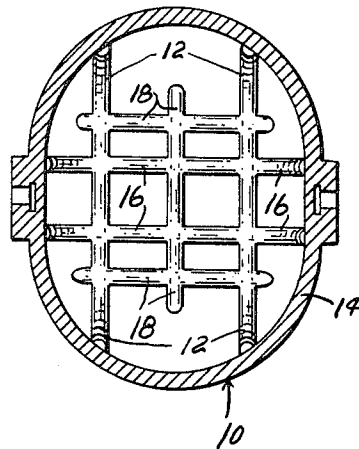
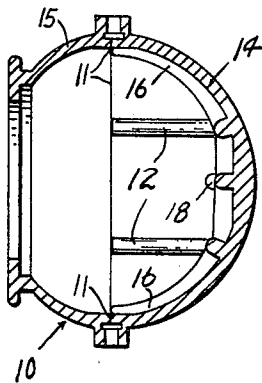


FIG. 3



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3,432,861

## EAR PROTECTOR

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1 Claim

### ABSTRACT OF THE DISCLOSURE

A sound attenuating ear protector in the form of a hollow shell which has a reticulate ridged network formed therein, the network of ridges extending across the protector in an area opposite an opening for the auricle of the ear.

This invention relates to an improvement in sound attenuating ear protectors of the type embodying a hollow shell having an auricle receiving opening, the shell surrounding and containing the auricle and being larger than necessary for this purpose.

It has been found that sound energy is attenuated to a greater degree the stiffer or more rigid the ear protector shell. Also, the more space in the shell, the greater the attenuating effect. Practical considerations of materials, size and weight however limit these parameters, and therefore any construction which provides improved rigidity without increase in weight or size is a great advantage, and it is the principal object of this invention to stiffen the prior art shell without increasing its size or weight, and in fact actually providing for a decrease of weight in certain designs.

This object is carried out by providing a network of ridges in the shell that can be molded in the shell as the latter is molded, such ear protector shells being commonly made of plastic for light weight strength. This construction has been found to rigidify the shell and to allow a thinner shell wall in some cases, so that weight is increased extremely little or even reduced. The result is increased attenuation in most ranges and substantial improvement in the area of 3000 c.p.s. where attenuation in the prior art has been poorer than in most other ranges.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which:

FIG. 1 is a view in elevation illustrating the new ear protector;

FIG. 2 is a section on line 2—2 of FIG. 1, and

FIG. 3 is a section on line 3—3 of FIG. 1.

In the drawings, the reference character 10 indicates the molded plastic shell as a whole. These shells are conveniently made in two parts 14 and 15 which are cemented together. Part 15 contains the auricle opening and the other part 14 is of a cup or basin shape and is continuous. Part 14 may be referred to as the "base part." These two parts are cemented together at their mating peripheries at 11. It has been found that by ap-

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plying the new ridge network to the interior surface of the base alone, the improvement in attenuation referred to is accomplished. The invention herein however does not preclude placing ridges on the part of the shell having the auricle opening nor on the exterior surface of either part of the shell.

A very simple and practical form of ridge network is found to comprise a series of ridges 12, in the example illustrated, a pair, extending in mutually spaced relation across the base 14 in a diametrical or chordal manner from points on the periphery thereof to like points oppositely situated. A similar series of ridges 16 at right angles thereto in the example intersect the ridges 12 and form the ridge network because these ridges are all integral both with respect to the base 14 and all the other ridges. Further connecting ridges 18 may be used also, particularly where the ear protector shell is not round but ovoid, as in the illustrated example. The shorter ridges 18 intersect with ridges 12 which are longer than ridges 16 because of the oval shape of the base part 14 of the shell as exemplified herein.

There is a great deal of variation possible in the dimensions, shapes, and angles of crossing of the ridges in this case, and it is not desired to limit the scope of the invention merely to the ridge network shown herein. Any form of ridge network that stiffens or rigidifies the shell with the consequent advantages in increased attenuation without substantial increase in size or weight is included in this invention.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

1. A sound-attenuating ear protector comprising a rigid, substantially oval-shaped shell having an outer concave part and an inner auricle-receiving part, both of said parts having mating peripheries secured together which define the major axis of said shell, said auricle-receiving part having an opening formed therein with the plane of said opening being in spaced-parallel relation to the plane of said major axis, said shell having a depth along the minor axis adapted to extend a substantial distance from a wearer's ear, the inside surface of said outer concave part having a series of chordal-like intersecting ridges for increasing the sound-attenuation of said shell.

### References Cited

#### UNITED STATES PATENTS

|           |         |                  |          |
|-----------|---------|------------------|----------|
| 1,973,330 | 9/1934  | Burritt          | 2—174    |
| 2,314,782 | 3/1943  | Goretsky         | 2—209    |
| 2,437,049 | 3/1948  | Salisbury et al. | 128—152  |
| 2,468,267 | 4/1949  | Mondl            | 179—156  |
| 2,899,683 | 8/1959  | Wadsworth et al. | 2—209    |
| 2,981,958 | 5/1961  | Wadsworth et al. | 2—209    |
| 3,112,005 | 11/1963 | Shaw et al.      | 2—209 XR |

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