June 28, 1966 S. A. BRALEY 3,257,668

SILICONE RUBBER PROSTHETIC EAR FRAME

Filed April 25, 1963

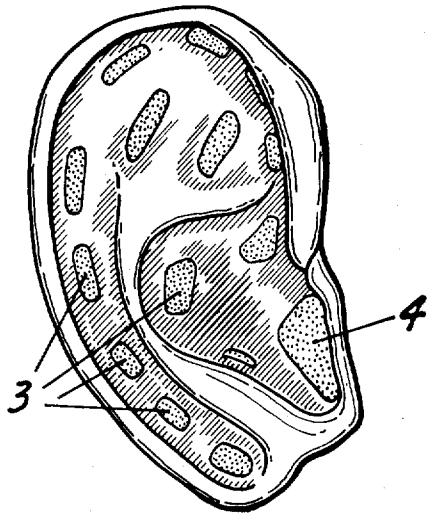


Fig. 1

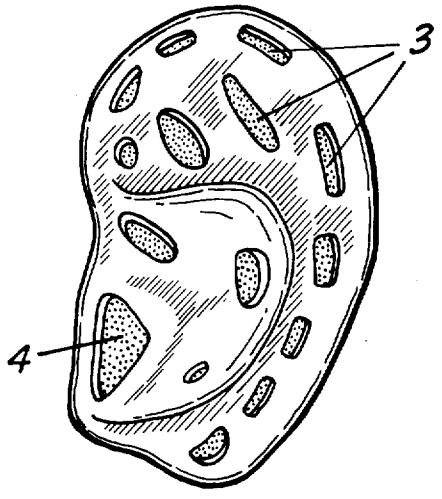


Fig. 2

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United States Patent Office 3,257,668 Patented June 28, 1966

3,257,668

SILICONE RUBBER PROSTHETIC EAR FRAME

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Filed Apr. 25, 1963, Ser. No. 275,612
1 Claim. (Cl. 3—1)

This invention relates to an ear frame.

The practice of replacing body parts lost in accidents missing due to congenital defects is an old and well tablished one. This practice has developed from the ude "peg-legs" and "hooks" of legendary pirate days the highly refined cosmetic prosthetic devices which e their present day counterparts.

The physiological benefits derived by individuals from rosethetic devices have long been recognized. However, has only been in recent years that the tremendous importance of the psychological benefits derived from prosthetic devices has been fully realized.

At present, one procedure employed for replacing a ost or missing ear involves making one from rubber or lastic and gluing it onto the head. To replace the ear urgically is very diffcult. One procedure is first to renove a piece of cartilage from a rib. This cartilage is hen carved by the surgeon into the desired shape and ize forming an ear frame. Openings or holes are carved n the depths of the contours of the ear frame, that is, in the areas known as the fossa of the helix, the fossa of he antihelix and the concha. These openings allow tisue to grow through the frame and thereby help to anchor the ear frame to the head. These openings also are important in causing the tissue to grow in conformity with the shape of the ear frame instead of giving a flat thick growth which results in the well known cauliflower type ear. The carved ear frame is implanted within the tissue layers at the appropriate site on the side of the head. Here it is allowed to remain for about one to six months, as determined by the surgeon, while the tissue heals around the newly implanted material and grows through the openings in the ear frame forming a firm anchor. The surgeon then makes an incision behind the implanted ear frame and brings the ear out to the proper angle. Skin is then grafted onto the back of the new ear and onto the head.

The present procedure has many attendant disadvantages. For example, it requires an operation to obtain a piece of cartilage to make the ear frame. The cartilage is very brittle and is subject to breaking, making it difficult for the surgeon to carve the frame. This brittleness is also a factor to be considered after the procedure is complete since it tends to give the ear more rigidity than is normal or natural. Also, cartilage is subject to being absorbed, giving an ear that is abnormally shaped. Furthermore, it is generally accepted that it is difficult to make successful implants of any kind close to the skin surface and an ear implant is by its very nature almost wholly surrounded by surface. If such an implant becomes exposed by an injury, it is also generally accepted that the implant must be removed because of the danger of infection.

It has now been discovered that an ear frame made of silicone rubber which contains areas of diminished thickness in the areas corresponding to the fossa of the helix, the fossa of the antihelix, the concha and the external auditory meatus of the natural ear, said areas of diminished thickness being thin webs of silicone rubber, overcomes many of the disadvantages of the materials employed heretofore for making ear frames.

FIGURE 1 is a view of the front of the ear frame of this invention.

FIGURE 2 is a view of the back of the ear frame of this invention.

As shown in the drawings, the ear frame contains several areas of diminished thickness **3** in the depths of the contours of the frame, that is, in the areas known as the fossa of the helix, the fossa of the antihelix and the concha. These areas of diminished thickness are thin webs of silicone rubber. These thin webs can be formed when the ear frame is made. The surgeon removes as many of the webs as he deems necessary prior to implanting the ear frame within the tissue layers. This allows the tissue to grow through the frame at the desired points. No tissue grows through the frame where the webs are left in place. The ear frame also contains an area of diminished thickness **4** which coincides with the external auditory meatus. The thin web **4** will be removed by the surgeon prior to implanting if the individual receiving the implant has facilities for hearing. If the individual receiving the implant does not have any facilities for hearing, the web **4** may or may not be removed as will be determined by the surgeon making the implant.

It will be noted that the ear frame contains no structure corresponding to the lobule. There are several reasons for this. In the natural ear there is no cartilage in the lobule. It is composed only of flesh. Also, some individuals have a very small lobule, if any, whereas other individuals have very large lobules. Employing the ear frame of the present invention, the surgeon can form a suitable sized lobule from a piece of flesh when the implanted frame is brought out into position. Thus, no structure for a lobule is needed on the ear frame.

The ear frame of this invention eliminates the necessity of an operation to obtain cartilage for making a frame. The surgeon does not have to spend the time and effort of carving an ear frame from the cartilage obtained. The silicone rubber from which the ear frame is made is completely compatible with the body tissue and fluids. Moreover, the silicone rubber is flexible rather than brittle like cartilage and is therefore easier to handle since it is not subject to breakage. This flexibility also results in a more natural ear. The silicone rubber ear frame can be sterilized in an autoclave without damage prior to implanting. Furthermore, the silicone rubber ear frame is not subject to being absorbed and thus does not have the shortcomings of cartilage in this respect.

The ear frame of this invention can be employed in the type of operation such as that described above instead of employing cartilage. Several successful experimental implants have been made using the ear frame of this invention that have provided individuals with a natural looking ear and thereby restored their appearance to normal. One instance is known where a youngster injured the new ear, exposing the ear frame. The wound was cleansed, the skin pulled in place over the frame and the wound bandaged. The injury healed without any infection and thus the implant did not have to be removed.

If a frame is needed for only part of an ear it is easily obtained from the ear frame of this invention by cutting off the portion of the ear frame not needed.

That which is claimed is:

An ear frame made of silicone rubber which contains areas of diminished thickness in the areas corresponding to the fossa of the helix, the fossa of the antihelix, the concha and the external auditory meatus of the natural ear, said areas of diminished thickness being thin webs of silicone rubber.

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