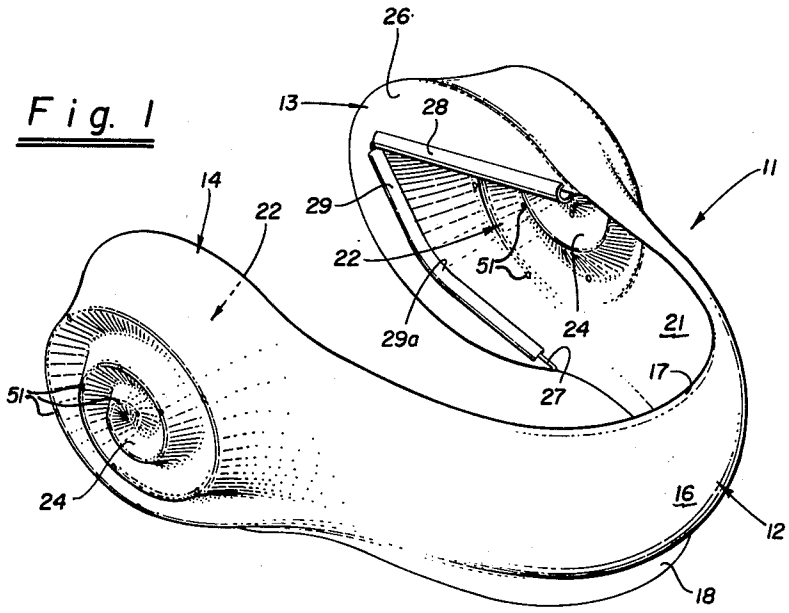
Nov. 3, 1964 C. H. MacFARLANE 3,155,189

VOICE REFLECTOR

Filed Feb. 28, 1962 2 Sheets-Sheet 1

Fig. 1



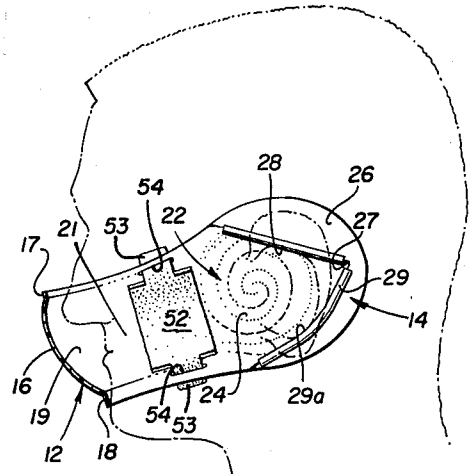


Fig. 2

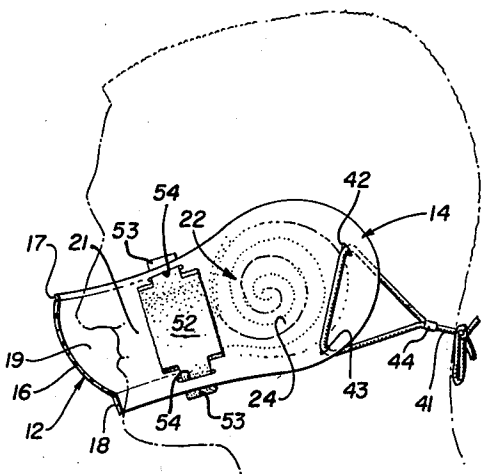


Fig. 5

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VOICE REFLECTOR

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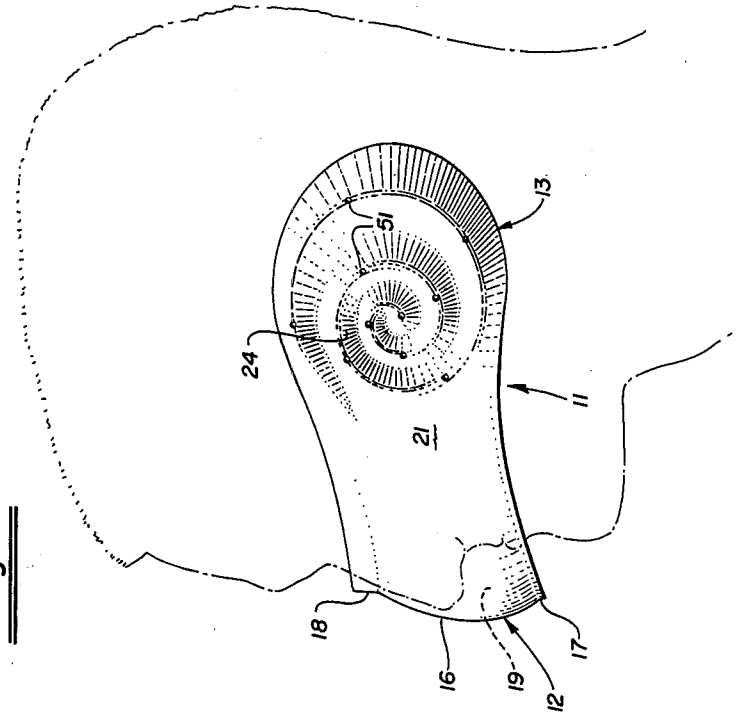

Fig. 4

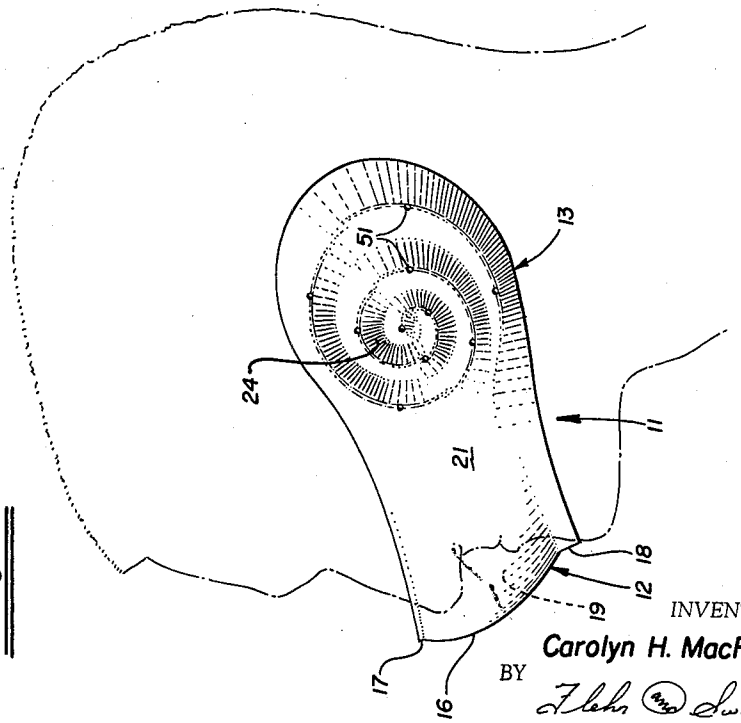

Fig. 3

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VOICE REFLECTOR

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5 Claims. (Cl. 181—20)

This invention relates to a voice reflector and more particularly to a device for use by language students, voice students and the like for helping to correct errors in accent, diction and intonation.

It is well known to those skilled in the art that a substantial portion of a person's speech is lost to the individual himself so that the individual is not aware of his errors in accent, diction and intonation. At the present time, a relatively inexpensive device which will supply the voice as it is spoken to the ears of the speaker is not available on the market. There is, therefore, a need for such a device, particularly for language students, voice students and the like.

In general, it is an object of the present invention to provide a voice reflector which is relatively inexpensive.

Another object of the invention is to provide a voice reflector of the above character which is supported by the head of the wearer.

Another object of the invention is to provide a voice reflector of the above character which will fit practically all sizes of heads.

Another object of the invention is to provide a voice reflector of the above character which is relatively light in weight and which can be comfortably worn.

Another object of the invention is to provide a voice reflector of the above character in which the voice of the speaker is channeled directly into the ears of the speaker.

Another object of the invention is to provide a voice reflector of the above character which can be readily placed on the head and also readily removed.

Another object of the invention is to provide a voice reflector of the above character which has particularly novel means for supporting the same upon the head of the speaker.

Another object of the invention is to provide a voice reflector of the above character which provides adequate ventilation to the wearer.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment is set forth in detail in conjunction with the accompanying drawings.

Referring to the drawings:

FIGURE 1 is a perspective view of a voice reflector incorporating my invention.

FIGURE 2 is a cross-sectional view of the voice reflector shown in FIGURE 1 showing the manner in which one of the side portions is secured to the ear of the wearer.

FIGURE 3 is a side elevational view showing one way of wearing the voice reflector shown in FIGURE 1.

FIGURE 4 is another side elevational view showing another way of wearing the voice reflector shown in FIGURE 1.

FIGURE 5 is a cross-sectional view similar to FIGURE 2 showing another embodiment of my invention.

In general, my voice reflector which is adapted to be worn upon the head of the wearer consists of a substantially U-shaped member of substantial width. The member has a frontal portion which is adapted to be positioned in front of the mouth of the wearer and to have one portion of the frontal portion rest upon a portion of the face of the wearer to support the frontal portion in a predetermined position with respect to the mouth of the wearer. The member is also formed with a pair of side portions joined to the frontal portion. Means is mounted on the side portions for supporting the side

portions so that portions of the side portions are positioned over the ears of the wearer so that the voice of the wearer is reflected by the frontal and side portions to the ears of the wearer.

As shown in the drawings, my voice reflector consists of a substantially U-shaped member 11 which is provided with a frontal portion 12 and a pair of side portions 13 and 14 which are formed integral with the frontal portion 12. As can be seen from other figures, the U-shaped member is proportioned in such a manner that a portion of the frontal portion is adapted to engage a frontal portion of the face of the wearer and portions of the side portions in the form of ear-receiving concavities are adapted to be positioned with respect to the ears of the wearer so that they overlie the ears of the wearer.

The frontal portion 12, as shown in cross-section in FIGURE 2, has an arcuate portion 16 which is convex when viewed from the exterior and concave when viewed from the interior. The frontal portion 12 is also provided with an upper relatively straight portion 17 which is formed integral with the upper portion of the curved arcuate portion 16 as viewed in FIGURE 2. The frontal portion 12 is also formed with a relatively straight portion 18 which adjoins the lower portion of the curved portion 16 and is formed integral therewith as viewed in FIGURE 2. It will be noted that the straight portion 18 has a width which is substantially greater than the straight portions 17 provided on the upper end of the voice reflector.

Upon viewing FIGURE 1, it can be seen that the arcuate portion 16 of the frontal portion 12 forms a frontal concavity 19 which is positioned in front of the mouth of the wearer for a purpose hereinafter described.

The side portions 13 and 14 are substantially identical and are mirror images of each other. These side portions 13 and 14, as explained previously, adjoin the frontal portion 12 and are formed integral therewith. The portions 13 and 14 are each formed with a portion 21 which has a concave inner surface and a convex outer surface. The portions 13 and 14 are also formed with ear-receiving concavities 22 which, as shown, also have a substantially concave inner surface and a convex outer surface. As can be seen from the drawings the frontal portion 12 is provided with upper and lower side edges in which one of the side edges is spaced at a greater distance from the ear-receiving concavities than the other side edge.

As can be seen, the portions 16, 21 and 22 form a pair of substantially curved paths whereby the voice of the wearer is reflected by a relatively smooth surface rearwardly to both ears of the wearer. The concavities 22 are formed with convolutions 24 which, it is believed, also aid the travel of the sound to the ear of the wearer. In addition, these convolutions provide an exterior appearance which adds to the attractiveness of my voice reflector.

Means is provided for supporting the side portions of the voice reflector so that the ear-receiving concavities 22 are positioned over the ears of the wearer whereby the voice of the wearer is reflected rearwardly and directly to the ears of the wearer. In the embodiment shown in FIGURE 1, such means consists of substantially flat portions 26 which adjoin the rims of the ear-receiving concavities 22 and overlie the concavities as shown particularly in FIGURE 1. Substantially V-shaped cut-outs 27 are provided in the portions 26 to accommodate the ears of the wearer. Means is provided on the portions 26 in the cut-outs 27 to prevent injury to or abrasion of the ears of the wearer and consists of split cylindrical members 28 and 29 which have been affixed over the side edges of the portion 26 forming the V-shaped cut-out. It will be noted that the cylindrical members

29 are provided with a slight curvature at 29*a* which is also formed in the V-shaped cut-out 27 to better accommodate the ears of the wearer.

The V-shaped cut-outs 27 provided in the portions 26 are positioned in such a manner that the ear-receiving concavities 22 are positioned automatically so that the concavities 22 are centered on the ear regardless of the position in which the voice reflector is worn. The cut-outs 27 are formed so that a plane bisecting the angles formed by the cut-outs also substantially bisects the frontal and side portions of the voice reflector. If desired the cut-outs 27 can be omitted by the manufacturer so that the purchaser can place cut-outs in the flat portions which will fit his ears and so the mask will properly fit his head.

The vioce reflector can be formed of any suitable material. However, it is desirable that the voice reflector be formed of a material which is relatively light in weight and inexpensive. For example, I have found that certain plastics such as polyethylene and vinyl can be satisfactorily used. If such plastics are used, they can be formed into voice reflectors in any suitable manner such as by vacuum molding, blow molding or injection molding. In forming the voce reflector, I have found that it is desirable to form the U-shaped member in such a manner that the ear-receiving concavities 22 normally assume a position when the voice reflector is not worn which is substantially less than the normal spacing between the concavities 22 when the voice reflector is being worn upon the head of a wearer. This is desirable because this provides a yieldable springing effect which helps to retain the voice reflector on the head of the wearer.

Use of my voice reflector may now be briefly described in conjunction with FIGURES 2, 3, and 4. As can be seen, the voice reflector can be worn in a number of ways depending primarily upon comfort to the wearer and the configuration of the wearer's head. For example, as shown in FIGURES 2 and 3, the voice reflector can be worn with the portion 18 lowermost. The concavities 22 are positioned over the ears so that the V-shaped cut-outs 27 in the portions 26 receive the ears. The portions 26 are positioned behind the ears with rounded or cylindrical members 28 and 29 engaging the ear as shown particularly in FIGURE 2. As soon as the concavities 22 are positioned over the ears, the frontal portion 12 may be lowered so that it engages the chin to thereby firmly support the frontal concavity 19 of the voice reflector in a predetermined position with respect to the mouth of the wearer as is shown particularly in FIGURE 3. As can be seen, the cup-shaped portion 16 is spaced away from the mouth so that the wearer of the voice reflector can speak without difficulty. Any sounds emanating from the wearer will be reflected rearwardly along the concave portions 21 into the ear-receiving concavities 22 so that the sounds can be readily received by the ears of the wearer.

The voice reflector can also be worn as shown in FIGURE 4, in which the portion 18 faces upwardly and an intermediate portion of the portion 16 engages the nose. Again, the frontal concavity 19 of the voice reflector is positioned in such a manner with respect to the mouth that the voice of the wearer is reflected rearwardly to the ears of the wearer.

The voice reflector can also be worn in another position similar to that shown in FIGURE 4 with the exception that the intermediate portion of the portion 18 is positioned immediately below the nose of the wearer. In this position, the frontal concavity 19 of the voice reflector is still in front of the mouth so that it will reflect the voice rearwardly to the ears of the wearer.

The particular manner or way of mounting chosen by the wearer normally will depend upon the configuration of the head of the wearer. This is determined primarily by the distance from the nose to the chin of the wearer and the distance from the ear to the chin. However, it has been found that most heads can accommodate the mask in any one of the three positions. Even if the wearer has a very small head, it has been found that the inclined portions provided by the V-shaped cut-out 27 will properly retain the voice reflector on the head of the wearer even though the ears of the wearer are not seated completely to the rear of the V-shaped cut-outs provided in the voice reflector. This is because the inclines formed by the cut-out serve to generally retain the voice reflector in the desired position in engagement with the front facial portion of the head of the wearer.

Because the portions forming the ear-receiving concavities 22 of the voice reflector must be sprung outwardly so that the voice reflector can be placed on the head of the wearer, the voice reflector has a tendency to snugly hug the ears and to prevent the frontal portion of the mask from falling downwardly below the position at which the wearer desires to wear the mask with respect to the mouth.

It has been found that the position shown in FIGURE 4 has certain advantages in that it gives greater ventilation to the wearer because the wearer does not breathe directly into the mask which is the case when the mask is worn in the position shown in FIGURE 3 but downwardly into the space between the portion 17 and the mouth. However, it has been found that the mask can be comfortably worn in the position shown in FIGURE 3, if desired. As explained previously, the manner in which the mask is worn by the individual is primarily determined by the configuration, that is, the size and shape of the head of the wearer.

In FIGURE 5, I have shown another embodiment of my voice reflector in which different means is provided for supporting the side portions of the voice reflector on the head of the wearer. Thus, as can be seen in FIGURE 5, I have provided a pair of flexible elongate elements such as tie cords or strings 41. The tie strings 41 are secured to the corresponding side portions of the voice reflector in a suitable manner such as by threading the same through a pair of holes 42 and 43 and then securing one end of the cord to an intermediate portion of the cord by a clamp 44. The free ends of the two cords or flexible elements can then be tied in a suitable position on the head of the wearer. For example, as shown in FIGURE 5, they can be tied at the nape of the neck as shown to retain the voice reflector in the desired position. Alternatively, if desired, the cords 41 can be tied on top of the head.

When such means as shown in FIGURE 5 is utilized for securing the ear-receiving concavities 22 over the ears, it is unnecessary to provide the voice reflector with the portions 26 and the V-shaped cut-outs 27. Thus, the ear-receiving concavities 22 can be completely open and positioned over the ear and held in this desired position by the cords 41. This embodiment of my voice reflector can also be positioned in any of the various ways hereinbefore described for the previous embodiment.

In order to still further improve the quality of the sound which is reflected to the ears by my voice reflector, I have found that it is desirable to place a plurality of holes 51 in the side pieces 13 and 14 which are disposed in the canals between the ridges of the convolutions 24 which are utilized for forming the ear receiving concavities 22 as shown in FIGURES 3 and 4. Another way to improve the voice quality and to minimize the echo, is to place a piece of sound absorbing material such as a piece of felt 52 in the side pieces 13 and 14 adjacent the ear receiving concavities 22. The felt pieces can be secured to the side portions 13 and 14 by suitable means as ears 53 which pass through slots 54.

I have found that my voice reflector is particularly useful for students of foreign languages. For example, it can be utilized for correcting accent and intonation,

assuming, of course, that the individual knows how he should sound. It is readily apparent that the voice reflector can be particularly effectively used by the student when used in conjunction with language records. Thus, it is possible for the student of languages to immediately realize that he is making errors which otherwise would not be possible because normally, errors in accent and intonation are often not heard by the speaker.

Also, through heightened awareness due to amplification of the voice by the voice reflector, my voice reflector is significantly helpful in habituating the student to new sounds and combinations of sounds and thus facilitate the student in acquiring the new habits and physical mechanics involved in producing these new sounds, all of which are basic in learning to speak a new language.

Also, for students of voice, my voice reflector, again through its amplification feature, will help the voice student in quickly and readily pointing out errors in accent, diction and intonaton.

My voice reflector can also be used for children with a partial hearing loss who are learning to speak. Because of the amplification of the voice by the transmission of the voice directly back to the ears, the child hears itself better and, therefore, can more easily and quickly establish his speech habts. My device should also be helpful in the teaching of retarded and handicapped children.

My voice reflector should also be helpful as a general study aid to students. For example, it should be an excellent aid in memorizing in which one of the crucial requirements is concentration because the voice reflector will reflect the voice of the listener back to the ears and will exclude extraneous sounds which otherwise would disturb the memorization process. Also, memorization can be accomplished by speaking very softly into the voice reflector and therefore without disturbing any one close by. Thus, in effect, the person memorizing has a playback which is almost simultaneous and very clear so that it is actually like a recording.

It is apparent from the foregoing that I have provided a voice reflector which is relatively simple and can be economically manufactured. It is also light in weight and can be readily positioned on the head of the wearer so that it can be used with ease and without discomfort to the wearer.

I claim:

1. In a voice reflector adapted to be worn upon and supported solely by the head of the wearer, a substantially U-shaped member having a substantial width, the member having a frontal portion forming an open frontal cavity, a portion of said member being adapted to have one portion rest upon the person of the wearer to support the frontal portion solely by the person of the wearer in a position so that frontal concavity is disposed in front of the mouth of the wearer, the member also having a pair of substantially open side portions of substantial width joined to the frontal portion and forming ear receiving concavities facing the ears of the wearer and means secured to the side portions and adapted to rest upon the head of the wearer for supporting the side portions solely by the head of the wearer and so that the ear receiving concavities are positioned over the ears of the wearer whereby the voice of the wearer is reflected by the frontal concavity rearwardly into the ear receiving concavities to the ears of the wearer, said means secured to the side portions for supporting the side portions consisting of substantially planar portions mounted on the side portions and overlying the ear receiving concavities, the planar portions being provided with substantially V-shaped cutouts, the substantially V-shaped cutouts being adapted to receive the ears of the wearer, the V-shaped cutouts being formed so that a plane bisecting the angles formed by the cutouts also bisects the frontal and side portions.

2. In a voice reflector adapted to be worn upon and supported solely by the wearer, a substantially U-shaped member of relatively light material having a substantial width, the member having an open frontal portion forming an open frontal concavity, said frontal portion having upper and lower side edges and being adapted to rest upon the person of the wearer to support the frontal portion solely by the person of the wearer in a position so that the frontal concavity is disposed in front of the mouth of the wearer, the member also having a pair of substantially open side portions of substantial width joined to the frontal portion and forming ear receving concavities facing the ears of the wearer and sound conducting channels connecting the ear receiving concavities to the frontal concavity, one of the edges of the side edges being spaced a greater distance from the ear receiving concavities than the other of the side edges, and means secured to the side portions and adapted to rest upon the head of the wearer for supporting the side portions solely by the head of the wearer so that the ear receiving concavities are positioned over the ears of the wearer whereby the voice of the wearer is reflected by the frontal concavity rearwardly into the ear receiving concavities to the ears of the wearer.

3. A voice reflector as in claim 2 wherein the frontal portion is formed so a space is provided in the vicinity of the lower portion of the nose and the frontal portion to facilitate breathing while wearing the voice reflector.

4. A voice reflector as in claim 2 wherein said voice reflector is formed so that when the voice reflector is in one position it rests upon the chin of the wearer and wherein the voice reflector is in a second position it engages the nose of the wearer.

5. In a voice reflector adapted to be worn upon and supported solely by the wearer, a single unitary member of relatively light material, the member being substantially U-shaped in cross section in a direction generally longitudinal of the member and also being substantially U-shaped in cross section in a direction generally lateral of the member, the member being formed with a frontal portion and a pair of side portions formed integral with the frontal portion, the frontal and side portions forming a continuous inwardly facing opening of substantial width to thereby provided a frontal concavity, a pair of ear receiving concavities spaced across from each other and channels connecting the ear receiving concavities to the frontal concavity, said frontal portion having upper and lower side edges, one of said side edges being spaced from the ear receiving concavities a greater distance than the other of said side edges, said frontal portion being adapted to rest upon the person of the wearer to support the frontal portion solely by the person of the wearer in a position so that the frontal concavity is disposed in front of the mouth of the wearer, the side portions being formed with means adapted to engage the ears of the wearer so that the side portions are supported solely by the ears of the wearer so that the ear receiving concavities are positioned over the ears of the wearer whereby the voice of the wearer is reflected from the frontal concavity rearwardly into the ear receiving concavities to the ears of the wearer.

References Cited in the file of this patent

UNITED STATES PATENTS

D. 189,450	Cousino	Dec. 20, 1960
1,494,019	Rasmussen	May 13, 1924
1,820,107	Agee	Aug. 25, 1931
2,151,706	Lieber	Mar. 28, 1939

FOREIGN PATENTS

214,420	Switzerland	Apr. 30, 1941
239,781	Switzerland	Mar. 1, 1946
343,637	Germany	Feb. 4, 1921

OTHER REFERENCES

Publication: "The Voiciphone," Scientific American, February 1923, vol. 128, No. 2, p. 117.