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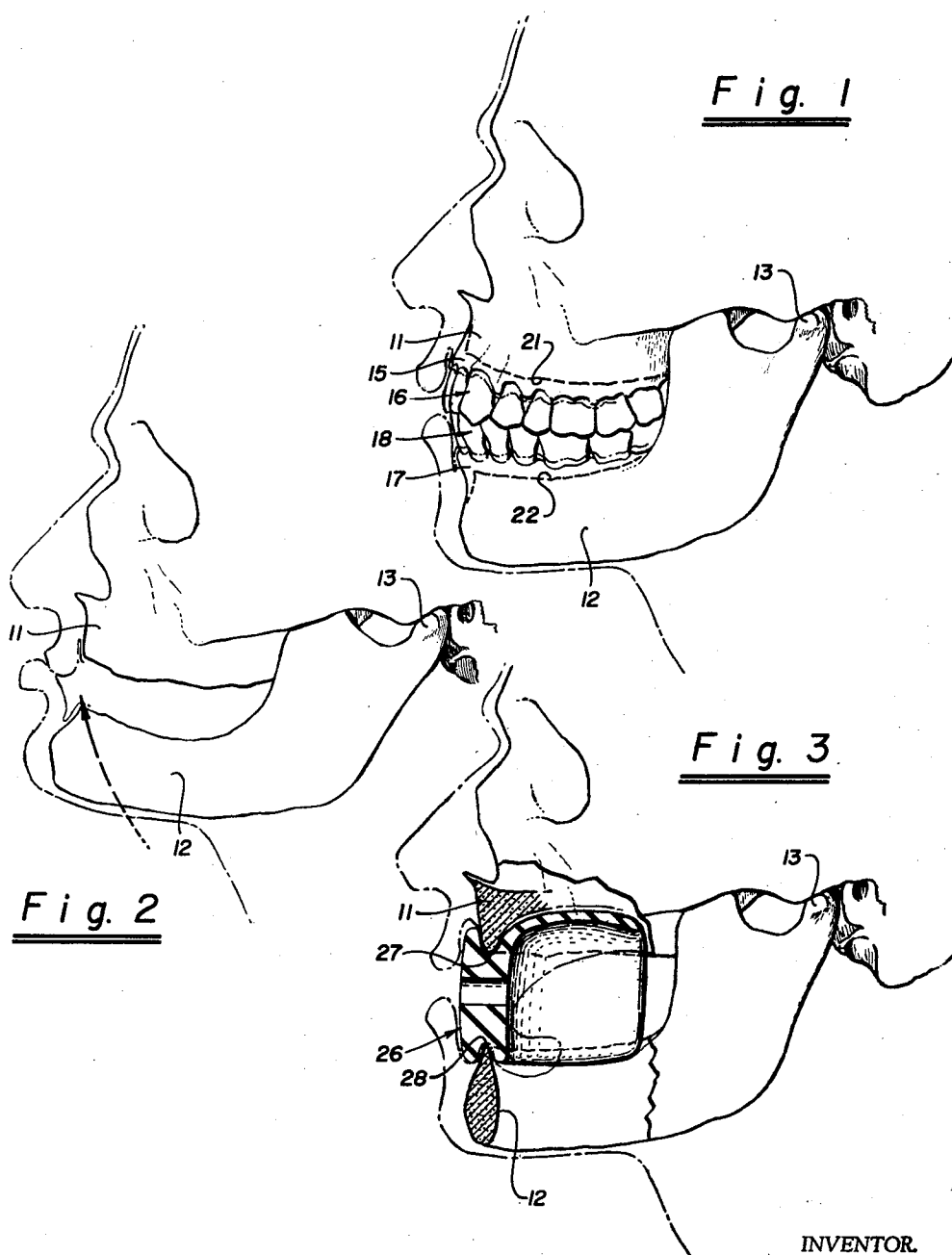
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EDENTULOUS MOUTHPIECE AND/OR MOUTH PROTECTOR

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2 Sheets-Sheet 1



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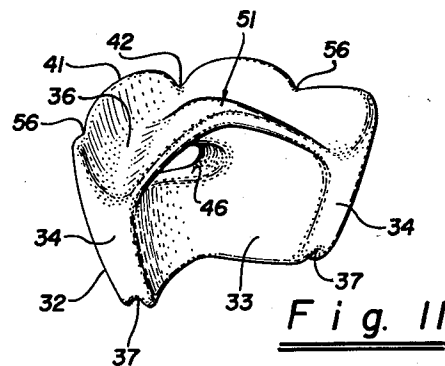
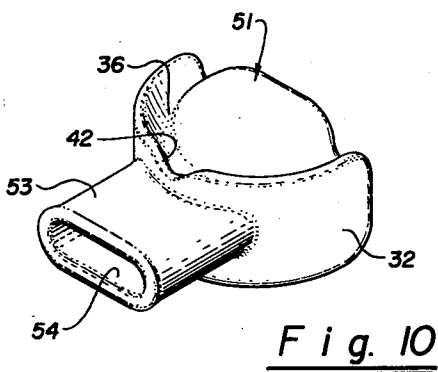
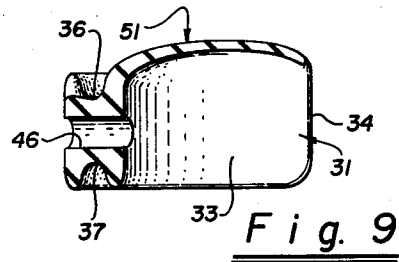
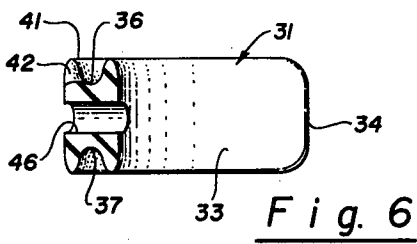
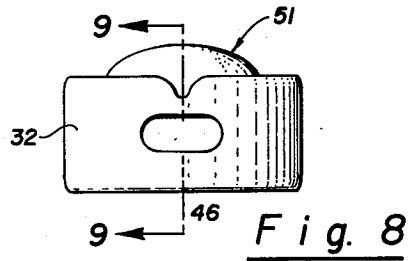
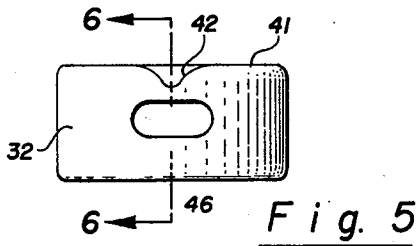
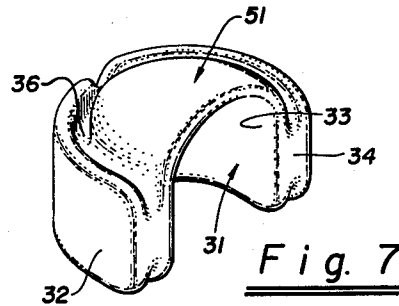
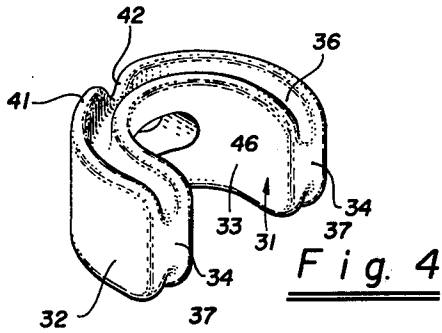
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EDENTULOUS MOUTHPIECE AND/OR MOUTH PROTECTOR

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2 Sheets-Sheet 2



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EDENTULOUS MOUTHPIECE AND/OR MOUTH PROTECTOR

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1 Claim. (Cl. 128—136)

This invention relates to an edentulous mouthpiece and/or mouth protector which is particularly adapted for use by individuals who wear dentures and who have all of their teeth missing in either one or both arches.

Individuals who wear dentures, especially those who have all of the teeth missing in one or both arches, subject themselves to possible injuries any time they engage in any form of contact sports where they are likely to suffer a blow to the face or jaws. The injury could be to the soft tissue of the lips, cheeks or residual ridges due to the forceful compression of these tissues against the hard plastic portion of the denture, against or between the plastic or porcelain teeth or between the hard plastic portions and the underlying bones of the structures constituting the mouth and jaws. Injury to the tongue could easily occur in the case of a fracture of the dentures. If the dentures are not worn in contact sports to prevent the foregoing injuries, injury to the temporo mandibular joint can occur due to overclosure of forceful lateral displacement of the lower jaw, which could result in the so called "knock-out" type of coma. There is therefore a need for an edentulous mouth protector to diminish or eliminate the likelihood of such injuries.

There is a definite need for a modification of this edentulous mouth protector so that it can be utilized as a mouthpiece in the field of skin diving and scuba diving. Where an individual is partially or wholly edentulous and wishes to indulge in these two sports, a prolonged overclosure of the temporo mandibular joint occurs when the individual uses the standard mouthpieces without his dentures. With his dentures in place there is a resultant lateral movement of the dentures especially when used with scuba diving equipment, due to the pull of the hoses from a two hose regulator or from the shifting of the weight of the single hose regulator which results in a soreness of the soft tissues in the mouth due to the constant irritation of the moving dentures. There is therefore a definite need for a mouthpiece which can be utilized in the field of skin diving and scuba diving.

In general it is an object of the present invention to provide a mouthpiece and/or mouth protector which is particularly adapted for use by individuals who have all their teeth missing in one or both arches.

Another object of the invention is to provide a mouthpiece and/or mouth protector which can be utilized in place of dentures by individuals playing contact sports.

Another object of the invention is to provide a mouthpiece and/or mouth protector of the above character which can be utilized by individuals in place of dentures in the field of skin diving and scuba diving.

Another object of the invention is to provide a mouthpiece and/or mouth protector which maintains the normal interdental space between the upper and lower and which prevents a trauma to the temporo mandibular joint.

Another object of the invention is to provide an edentulous mouthpiece and/or mouth protector of the above character which is provided with means for establishing an adequate seal between the roof of the mouth and the means for stabilizing the mouthpiece.

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

Referring to the drawings:

FIGURE 1 is a lateral view showing the maxilla (the

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bone forming the upper jaw) and the mandible (the bone forming the lower jaw) and their relative relationships with both the maxilla and mandible carrying their full complements of teeth.

FIGURE 2 is a lateral view similar to FIGURE 1 and showing the positions between the maxilla and the mandible when they are edentulous.

FIGURE 3 is a cross-sectional view of an edentulous mouth protector incorporating my invention disposed between the edentulous upper and lower arches in the mouth of a user.

FIGURE 4 is an isometric view of a mouth protector incorporating my invention.

FIGURE 5 is a front elevational view of the mouthpiece as shown in FIGURE 4.

FIGURE 6 is a cross-sectional view taken along the line 6—6 of FIGURE 5.

FIGURE 7 is an isometric view of another embodiment of my mouth protector which is similar to the mouth protector provided in FIGURE 4 with the exception that it is provided with a palatal extension.

FIGURE 8 is a front elevational view of the mouth protector shown in FIGURE 7.

FIGURE 9 is a cross-sectional view taken along the line 9—9 of FIGURE 8.

FIGURE 10 is an isometric view of another embodiment of my mouthpiece provided with a sleeve adapter.

FIGURE 11 is another embodiment of my mouth protector.

In general, my mouthpiece and/or mouth protector is provided for placement between the upper and lower arches in the mouth of the user wherein at least one of the arches is edentulous. The device consists of a soft resilient body which is substantially U-shaped and which is formed with upper and lower seats for receiving the upper and lower arches. The body is also formed with an opening in the anterior portion thereof to permit breathing through the mouthpiece. The body is dimensioned so as to maintain the normal interdental space between the arches to prevent trauma to the temporo mandibular joint. To provide additional protection, the body is formed with labial flanges extending between the upper arch and the lips and cheeks of the user.

In order to more fully understand my invention, it is necessary to consider the human mouth. In FIGURE 1 I have shown a lateral view of a portion of the human skull which particularly shows the maxilla 11 (the bone which forms a part of the upper jaw) and the mandible 12 (the bone which forms the lower jaw). Also shown is the temporo mandibular joint 13 which is the joint formed between the mandible 12 and the base of the skull 14. Also shown in FIGURE 1 is the alveolar process 15 for the maxillary teeth 16 and the alveolar process 17 for the mandibular teeth 18. As is well known to those skilled in the art, the alveolar process is a ridge projecting from the lower surface of the body of the maxilla or the upper surface of the mandible containing the alveoli of the teeth. The alveoli are the bony sockets in which the roots of the teeth rest.

As is well known to those skilled in the art, when the maxilla and the mandible become edentulous that is without teeth, the alveolar process in the maxilla and the mandible will resorb to positions generally indicated by the dash lines 21 and 22 shown in FIGURE 1. The maxilla resorbs upwardly and inwardly to become progressively smaller because of the direction and inclination of the roots of the teeth and the alveolar process. Consequently, the older the edentulous maxilla, the smaller its bearing area. The opposite is true of the mandible, which inclines outwardly and becomes progressively wider according to its edentulous age.

FIGURE 2 is a lateral illustration similar to FIGURE 1

showing edentulous maxilla and mandible with the alveolar process of both being resorbed. When this occurs, it is readily apparent that overclosing of the mandible occurs. When dentures are not worn to maintain the proper interdental spacing between the maxilla and mandible, overclosing occurs which as is well known to those skilled in the art produces temporo mandibular joint disturbances which often result in trigeminal neuralgia, commonly called facial neuralgia.

Because of the difficulties pointed out above, individuals who wear dentures often remove their dentures while playing contact sports because of the possible injury which can occur as explained above. Also, individuals who participate in the field of skin diving and scuba diving also remove their dentures because of soreness or irritation caused by lateral movement of the dentures as the skin diving and scuba diving equipment is utilized.

In FIGURES 3-11 I have shown a mouthpiece and/or protector which can be utilized by such individuals so that they can participate in contact sports and participate in skin diving and scuba diving.

As shown in FIGURE 3, one of my mouthpieces and/or protectors 26 is shown disposed in the mouth of the user between the upper and lower arches or ridges 27 and 28. By the term arch or ridge, I mean to include the soft tissue which overlies the bony structure which forms a part of the upper and lower jaws. As shown in FIGURE 3 and hereinafter described in detail, the mouthpiece and/or protector is designed in such a manner that it will preserve the interdental spacing between the maxilla and the mandible even though one or both may be edentulous.

One embodiment of my mouthpiece and/or protector is shown in FIGURES 4, 5 and 6 and as shown is formed of a body 31 of a suitable soft resilient material such as a silicon rubber or other suitable elastomer. The silicon rubber can be of a cold or hot pour type, but preferably is of a hot pour type. Other materials which can also be utilized include latex and thikol rubbers. The body 31 is substantially U-shaped so that it conforms generally to the configuration of the upper and lower arches in the human mouth. The body 31 is provided with an outer peripheral surface 32 and an inner peripheral surface 33 which are substantially vertical and parallel as shown and which terminate in relatively flat end portions 34. The peripheral surfaces 32 and 33 are substantially smooth as shown so that they will not irritate the soft tissues in the mouth. The body is also formed with an upper ridge seat 36 and a lower ridge seat 37 on the upper and lower extremities of the body 31. The seats 36 and 37 form grooves which are substantially U-shaped in cross-section. The seats 36 and 37 follow the contour of the body as shown particularly in FIGURE 4. They also have a configuration so that they can receive the upper and lower edentulous ridges 27 and 28 as shown particularly in FIGURE 3.

The seats 36 and 37 are spaced apart a distance which maintains the interdental space between the upper and lower ridges. The seats 36 and 37 are formed in such a manner that they can receive either edentulous ridges or ridges or arches which have full complements of teeth. Thus, it is possible to utilize my mouthpiece and/or protector when either or both of the ridges are edentulous. When only one of the ridges is edentulous, it is only necessary to decrease the spacing between the seats 36 and 37 by the required amount, as for example a distance of approximately 5 millimeters.

The body is also formed with an upper labial flange 41 which is substantially U-shaped which extends upwardly from the bottom portion of the upper ridge between the upper ridge and the lip and cheeks. This labial flange is provided with a substantially V-shaped cut-out 42 which is provided for receiving the front labial frenum.

The mouthpiece and/or protector is provided with an orifice or opening 46 which is formed in the anterior portion of the body. The opening is substantially wider

along its horizontal transverse axis as shown particularly in FIGURE 5 than it is along its vertical axis. The opening serves as an intake or air outlet to facilitate comfortable breathing by the individual utilizing my mouthpiece and/or protector.

Use of my mouthpiece and/or protector may now be briefly described as follows: Assuming that the individual who is to use the mouthpiece and/or protector has upper and lower dentures, the individual removes these dentures and inserts the mouthpiece into his mouth so that the upper and lower ridges are disposed within the seats 36 and 37 provided in the mouthpiece. As hereinbefore explained, the spacing between the seats 36 and 37 is such that proper interdental spacing is maintained between the upper and lower ridges. The individual wearing the mouthpiece and/or protector can participate in contact sports without fear of injury to his mouth which would normally be caused if he were wearing dentures. The mouthpiece is constructed of a soft flexible material which gives the desired cushioning effect. The labial or buccal flange 41 protects the lips and cheeks and the edentulous ridges. Since the mouthpiece maintains the proper interdental space between the upper and lower ridges, overclosing of the lower jaw does not occur and hence there is no danger of causing trauma to the temporo mandibular joint 13 which in turn could cause trigeminal neuralgia.

The grooves or seats 36 and 37 provided in the mouthpiece are shaped so as to provide proper stability and retention of the mouthpiece. The mouthpiece is shaped in such a manner that it cannot ride back and gag the individual wearing the same. The lower seat 37 provides the primary support for the mouthpiece. The upper seat 36 is provided primarily for the purpose of establishing a seal between the upper ridge and the mouthpiece.

Another embodiment of my mouthpiece and/or protector as shown in FIGURES 7, 8 and 9 and is very similar to the embodiment shown in FIGURES 4, 5 and 6 with the exception that it is provided with a palatal extension 51 which is in the form of a roof-like structure joining the inner peripheral surface of the body 31. It will be noted that the body 31 is still open to the rear.

The palatal extension 51 is provided where it is desired to add increased stability to the mouthpiece. Increased stability is possible because the tongue of the individual aids in retaining the mouthpiece in place because the tongue is pressed upward against the palatal extension to maintain the palatal extension in engagement with the palate of the wearer. The passage or orifice 46 through the anterior portion of the body makes it possible to breathe comfortably while wearing the mouthpiece and/or protector.

Another embodiment of my mouthpiece and/or protector is shown in FIGURE 10 and is similar to the embodiment shown in FIGURES 7, 8 and 9 with the exception that it is provided with a sleeve adapter 53 which is formed as an integral part of the body. The sleeve adapter 53 is relatively elongate and provides an opening 54 which joins the opening 46 and which has substantially the same shape as opening 46. The sleeve adapter 53 is formed in this manner so that it can readily pass between the lips of the user wearing the mouthpiece. This sleeve adapter can be readily connected to the gear which is utilized in skin diving and scuba diving. For example, the sleeve adapter 53 can be connected to the non-return valve portion of the scuba regulator and replacing the standard mouthpiece which is utilized with the scuba regulator. The sleeve extension 53 can also be connected to the snorkel or breathing tube of the skin diver to replace the standard types of mouthpieces supplied with such gear.

Even though there may be some pulling and hauling upon the mouthpiece shown in FIGURE 10 because of the gear connected thereto, there will be very little if any lateral movement of the mouthpiece because the lateral movement will be taken up by the sleeve adapter or ex-

tension 53. Even if there is a certain amount of lateral movement of the mouthpiece, the movement will not irritate the ridges in the mouth because the material utilized for the mouthpiece is so soft and resilient.

Another embodiment of my mouthpiece and/or protector is shown in FIGURE 11. This embodiment is very similar to the embodiments previously shown and typifies a mouthpiece and/or protector which has been custom designed for a particular user's mouth. The embodiments hereinbefore disclosed have been standardized so that they will fit the average mouth. However, if the mouth of the individual has some peculiarities a custom mouthpiece and/or protector can be designed as shown in the FIGURE 11. The body of this mouthpiece is very similar to the bodies hereinbefore described with the exception that the outer and inner peripheral surfaces 32 and 33 curve slightly inwardly and downwardly. Additional scallops 56 are provided in the buccal or labial flange 41 for receiving additional buccal frenuli in the mouth.

Any or all of the mouthpieces and/or protectors shown in the drawings can be provided with sleeve extensions if desired so that they can be utilized with skin diving and scuba diving equipment. Also any one of the mouthpieces and/or protectors shown in the drawings can be formed without a sleeve adaptor so that they can be used solely as mouth protectors. As also pointed out previously, the mouthpieces and/or protectors can be dimensioned so that they maintain the proper interdental spacing regardless of whether either one or both of the upper and lower ridges (the maxilla and mandible) are edentulous.

It is apparent from the foregoing that I have provided a new and improved mouthpiece and/or protector which is particularly useful for individuals in which either or both the mandible and the maxilla are edentulous. The mouthpiece and protector is particularly useful for such individuals who wish to participate in contact sports or to participate in skin diving and scuba diving.

I claim:

In a mouthpiece for placement between the upper and lower ridges of the mouth of a user for use for substantial periods of time wherein at least one of the ridges is edentulous, a body of soft resilient material, the body having a configuration which is substantially U-shaped

and conforming in cross-section and length to the general configuration of the upper and lower ridges of the user, the body being formed with relatively smooth outer and inner planar and substantially vertical peripheral surfaces, said body being formed with upper and lower elongated recesses substantially U-shaped in cross section in the upper and lower portions thereof, the recesses having substantially the same U-shaped configuration as the body, the innermost extremities of the recesses being spaced one above the other in vertical alignment, at least one of the upper and lower recesses being relatively shallow and contoured to receive an edentulous ridge of the user and being dimensioned to permit the edentulous ridge of the user to engage the innermost portions of the recess in the body, the portions of the body forming the side walls of said one recess forming substantially vertical low flanges so that the edentulous ridge can seat in said one recess to apply a clamping pressure to the body without the flanges injuring the mouth of the user, the body and the recesses being formed so that with respect to the bite plane with normal interdental spacing, the vertical distance from said plane to the innermost extremity of at least one of said recesses is equal to the distance from said plane to the corresponding edentulous ridge to thereby maintain the normal interdental spacing between the upper and lower ridges of the user to thereby prevent trauma to the temporo mandibular joint, the body being formed with an open passage extending through the anterior portion thereof to facilitate breathing of the user, one end of said passage terminating adjacent said inner peripheral surface of said body so that the region in the vicinity of the tongue of the user is unobstructed, the body also being formed with a palatal extension extending between the inner peripheral surface of the body to provide a roof-like structure to seat against the pallet of the user to help to inhibit sidewise movement of the body during use.

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