July 9, 1963 F. P. MOFFETT 3,096,761

MOUTH PROTECTOR

Filed Sept. 18, 1961

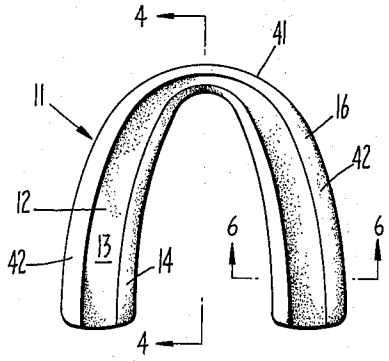


FIG_1

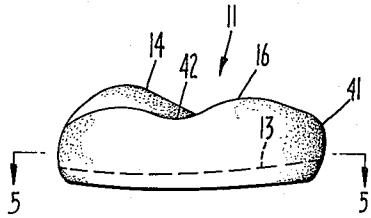


FIG_2

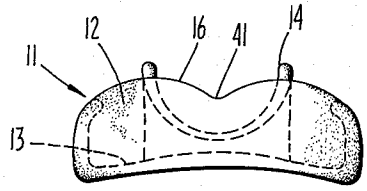


FIG_3

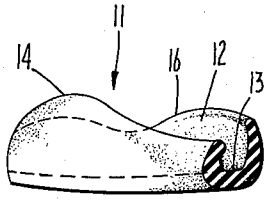


FIG_4

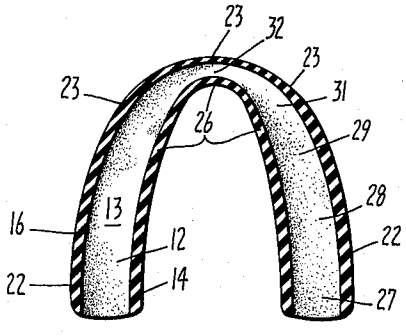


FIG_5

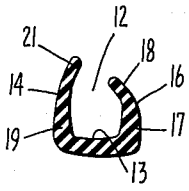


FIG_6

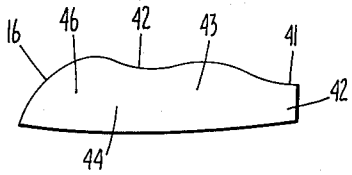


FIG_8

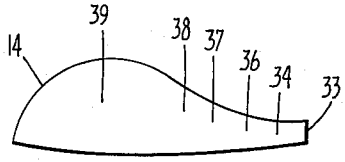


FIG_7

INVENTOR.
FRED P. MOFFETT

BY
Gardner & Zimmerman
ATTORNEYS

United States Patent Office 3,096,761 Patented July 9, 1963

3,096,761

MOUTH PROTECTOR

Fred P. Moffett, 60 Quail Ave., Berkeley, Calif.

Filed Sept. 18, 1961, Ser. No. 138,918
3 Claims. (Cl. 128—136)

My invention relates generally to mouth protectors and more particularly is directed to such devices as are adapted for mounting on the user's teeth to prevent injuries to the teeth, lips, temporo-mandibular joint and its articulating capsule, and other regions of the mouth.

In providing a protector for use in human mouths of different sizes there presently exists a problem in achieving a tight secure fit without sacrificing maximum comfort to the wearer. The patent for a Universal Mouth Protector, No. 2,966,908, of which I am a co-inventor, discloses a device capable of fitting different size mouths and includes means to prevent dislodgement of the protector. Now the present invention is concerned with improvements upon the prior patented device as generally regards the comfort of the wearer, and more particularly with respect to substantially eliminating irritation to the user's gums and soft tissues of the palate. The novel features of my invention enable the instant mouth protector to be worn comfortably as well as to be firmly secured in the user's mouth.

It is accordingly a primary object of the present invention to provide a novel and improved mouth protector adapted to be worn with great comfort.

It is another object of the invention to provide a mouth protector which may be worn without causing irritation to the soft tissues of the palate.

It is a further object of the invention to provide a mouth protector adapted to fit securely in the user's mouth, yet which does not in so doing cause irritation to the gum tissue.

Another object of the invention is to provide a mouth protector adapted for use in human mouths of different sizes and shapes.

A further object of the invention is to provide a protector capable of mounting on either the upper or lower teeth of the user.

Still another object of the invention is to provide a mouth protector which affords full protection to the wearer's teeth, lips, and cheeks.

An even further object is to provide a protector adapted to prevent injury to the temporo-mandibular joint and its articulating capsule.

Yet another object is to provide a mouth protector adapted for use by orthodontic patients having braces or the like on their teeth.

A still further object is to provide a mouth protector which is not readily dislodged, even when the jaws are separated, thereby affording free and easy mouth breathing.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims.

FIGURE 1 is a plan view of a mouth protector embodying the novel features of my invention.

FIGURE 2 is a side view of the mouth protector shown in FIGURE 1.

FIGURE 3 is a frontal view of the mouth protector.

FIGURE 4 is a cross-sectional side view taken through the plane 4—4 in FIGURE 1.

FIGURE 5 is a cross-sectional top view taken through the plane 5—5 in FIGURE 2.

FIGURE 6 is a cross sectional view taken through the plane 6—6 in FIGURE 1.

FIGURE 7 illustrates in elevation a portion of the inner wall of the instant protector as it would appear if laid out on a planar surface.

FIGURE 8 illustrates in elevation a portion of the outer wall of the instant mouth protector as it would appear if laid out on a planar surface.

Referring now to the drawings for the details of my invention, there is shown a mouth protector **11** having a generally U-shaped trough **12**, the trough including a floor **13**, an inner wall **14** and an outer wall **16**. It will be noted that my invention provides no beads, ribs, or the like along either the inner or outer wall, but instead adapts both walls with smooth inner surfaces whereby irritation to the gum tissues is prevented. As is described hereinafter, it is the novel shape and contour given to the walls of the instant protector which provides the means of achieving a secure fit. In this manner the present invention affords smooth surfaces to contact the gum tissue of the mouth, thereby providing maximum comfort, yet nevertheless adapts the instant protector to be retained securely on either the upper or lower teeth of the wearer.

It is noted at the outset that my invention is in many ways similar to the device disclosed in the aforementioned patent. The protector **11** is made of a flexible material, preferably a vinyl resin plastic, and has an open ended trough whereby the device can be manipulated to fit over the teeth of different size mouths. With regard to the floor **13** of the instant protector, it is seen in FIGURES 2 and 4 that the thickness thereof increases gradually from the rear portion to be occupied by the molars to the frontal portion to be occupied by the incisors, this increase being conventional and such as to conform to the normally existing angle of approach of the upper and lower jaws. In this manner a simultaneous engagement with the floor is achieved as regards the molars and incisors.

Although other features of my invention may appear similar to those of the prior patented device, it will be appreciated in view of the following description that critical differences exist as regards the exact configuration, size and shape of the instant device. Because of their great importance in achieving the objects set forth above, much attention will be directed towards the various dimensions involved in specifically defining the preferred embodiment of my invention.

Looking now at FIGURE 6, it is seen how the present invention achieves the desired gripping action to keep the protector secured in place without causing discomfort to the wearer. There is shown a cross-section of the trough **12** in the rear portion thereof which fits over the person's double-teeth, it being noted that a secure fit over these is important to properly retain the protector. Included in the outer wall **16** is a lower portion **17** and an upper portion **18**, the upper portion being inclined inwardly towards

the inner wall 14. When the protector is fit over the teeth the outer wall has its smooth surface bearing against the gums whereby the protector is prevented from sliding down. Note, however, that the inclination of the outer wall by itself may not be sufficient to achieve a sufficient bearing force to retain the protector. Hence I have provided as a novel feature of my invention a lower wall portion 17 of increased thickness with relation to the upper wall portion 18, whereby the upper portion is maintained in its inclined position with greater resiliency.

In more detail, the lower wall portion 17 illustrated in FIGURE 6 is adapted with a 4/32 inch thickness, the wall 16 then gradually tapering upwardly to a 3/32 inch thickness in the upper wall portion 18. In a similar manner, the inner wall 14 also includes a lower portion 19 and an upper portion 21, and in the rear wall portion shown in FIGURE 6 the lower portion 19 is provided with a 4/32 inch thickness which then tapers into the upper wall portion 21 having a 3/32 inch thickness. Note also that the inner wall 14 is preferably inclined slightly towards the outer wall 16 to provide additional gripping action, but this angle is made small in order that the inner wall be allowed to conform to the inner gums which incline toward the roof of the mouth.

In a similar manner to that described with reference to FIGURE 6, both walls of the instant protector are characterized generally throughout their lengths by a thicker bottom portion which tapers upwardly into a relatively thinner top portion. In combination with the inclined upper portion of the outer wall, this feature enables the instant device to be securely retained with a smooth snug fit, and eliminates the necessity for any bead or ribbing along the top of the walls which often tend to cut into the gums or otherwise cause irritation.

With the foregoing features in mind, reference is now made to FIGURE 5 wherein is shown a cross-sectional top view of the bottom portions of both walls. As regards the outer wall 16, the rear double-teeth portions 22 thereof are made about 4/32 inch thick, as noted above, the wall 16 then tapering gradually towards the frontal single-teeth portion 23 wherein the thickness is reduced to about 3/32 of an inch. Similarly, the bottom of the inner wall 14 is about 4/32 inch thick in the rear portions 24 and then is reduced to about 3/32 inch thick in the frontal portion 26.

Still referring to FIGURE 5, the spacing between the walls as measured adjacent the floor 13 is next described. Noting that the regions between the walls 14 and 16 are designated by the numerals 27, 28, 29, 31 and 32, the corresponding lateral dimensions between the walls in these regions are respectively, in inches, 8/32, 8/32, 6/32, 4/32 and 2/32. Hence the trough 12 is made to properly conform to the decreasing tooth size as evidenced in progressing forwardly from the molars to the incisors.

As regards now the upper regions of the trough 12, the lateral spacing as measured between the upper wall portions is about 4/32 inch in the rear wall portions, and reduces to about 3/32 inch in the frontal wall portions. The upper rear portion of the outer wall 16 is about 3/32 inch thick, as noted above, and this upper wall thickness is then gradually reduced to about 2/32 inch in the frontal wall portion. Similarly, the 3/32 inch thick upper rear portion of the inner wall 14 tapers down to about 2/32 inch in the upper frontal wall portion.

Thus it is seen that the walls of the instant protector are adapted to bear inwardly against the gums, this bearing pressure being reinforced by the increased wall thickness in the lower wall portions.

It is also noted that the increased thickness along the bottom wall portions of the instant protector serves a further purpose in addition to enhancing the gripping action. More particularly, a person's teeth are capable of biting with a pressure of 300 pounds per square inch, this force often having a tendency to split the wall from the floor portion. Thus the instant protector being strengthened along the juncture of the wall and floor portions is afforded greater durability in this regard.

Another problem existing with previous mouth protectors is that the inner wall extends too high in the frontal portion whereby it tends to cut into the soft tissue of the palate, or the roof of the mouth, thus causing discomfort to the user. Looking now at FIGURE 7 it is seen how the height contour of the inner wall 14 of the instant invention eliminates this difficulty. Progressing rearwardly from the extreme frontal region, there are designated subsequent regions 34, 36, 37 and 38, the regions being spaced 6/32 inch apart. The corresponding wall heights at these regions are respectively, in inches, 5/32, 6/32, 8/32, 10/32 and 12/32. The wall then rises to a peak height of 22/32 inch at the region 39, which is spaced about 42/32 inches from the extreme front region 33. Thus in an exacting manner, the instant invention reduces the height of the inner wall along its frontal portion whereby the wall conforms more comfortably to the roof of the user's mouth.

As regards the outer wall 16 of the instant invention, its general shape is simlar to that found in conventional mouth protectors, there being a lower frontal portion 41 which allows clearance for the labial frenum of the mouth, and another reduced height portion 42 located in correspondence with the buccal muscle attachments in the mouth. However, because of the novel gripping action of the instant protector it is possible for the outer wall to be lower in its highest portions than the outer wall of conventional devices, this being important as it provides an additional source of comfort to the wearer. More particularly, with reference to FIGURE 8 the outer wall 16 is shown as having regions designated by the numerals 42, 43, 44 and 46, these regions being characterized respectively by wall heights, in inches, of 13/32, 16/32, 15/32, and 16/32. These heights are correspondingly lower than those found in conventional mouth protectors.

Because of the reduced overall height of the outer wall in addition to the smooth wall surfaces, the instant mouth protector is adapted to fit over the lower teeth of the wearer, as well as the upper ones. In contact sports such as football, it is often necessary for a player, for example the quarterback, to speak out loud while under conditions in which mouth protection is needed. Inasmuch as it has been found that the use of a mouth protector on the bottom teeth enables the wearer to speak more clearly and freely, it is seen that the present invention affords another advantage heretofore not possible with conventional upper teeth protectors.

What is claimed is:

1. A mouth protector comprising a generally U-shaped trough formed of resilient material and adapted to fit over a person's teeth, said trough including a floor, an inner wall along the inner edge of said floor, and an outer wall along the outer edge of said floor, said outer wall including a frontal portion being about 3/32 inch thick adjacent said floor and tapering upwardly to a thickness of about 2/32 inch in the upper frontal portion, said outer wall further including a rear portion extending from said frontal portion and being about 4/32 inch thick adjacent said floor, said rear outer wall portion tapering upwardly to a thickness of about 3/32 inch in its upper portion, said inner wall including a frontal portion being about 3/32 inch thick adjacent said floor and tapering upwardly to a thickness of about 2/32 inch in its upper portion, said inner wall further including a rear portion extending from said frontal portion and being about 4/32 inch thick adjacent said floor, said rear inner wall portion tapering upwardly to a thickness of about 3/32 in its upper portion, said inner walls being spaced apart about 8/32 inch adjacent said floor in their confronting rear portions, said upper rear outer wall portion being inclined towards said inner wall to the extent that said inner and outer walls are spaced apart about 4/32 inch as measured between the confronting upper rear wall

portions, said floor gradually narrowing in width from its rear portion towards its frontal portion with said inner and outer walls being spaced apart about 2/32 inch adjacent said floor in their confronting extreme frontal portions, and said inner and outer walls being spaced apart about 3/32 inch as measured between their confronting upper frontal portions.

2. A mouth protector as in claim 1 characterized by said frontal portion having a height of about 5/32 inch at its lowest medial portion and gradually increasing in height rearwardly in along said inner wall for about 24/32 inch to a position where the maximum height is about 12/32 inch.

3. A mouth protector as in claim 1 further characterized by said outer wall being no more than ½ inch in height at its highest point, and having relatively low wall height of about 13/32 inch adjacent its medial front portion.

References Cited in the file of this patent

UNITED STATES PATENTS

2,966,908	Cathcart	Jan. 3, 1961
3,016,052	Zubren	Jan. 9, 1962