July 7, 1970 K. W. GORES 3,518,988

MOUTHGUARD

Filed Dec. 5, 1967

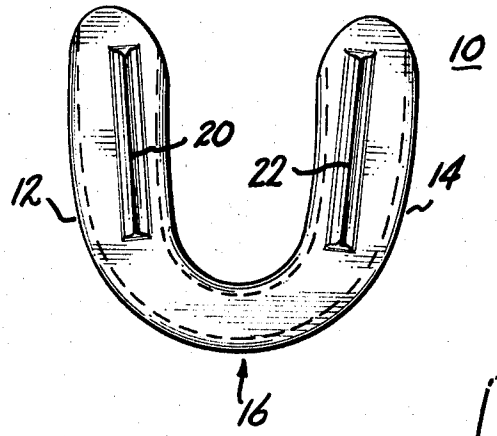


Fig. 1

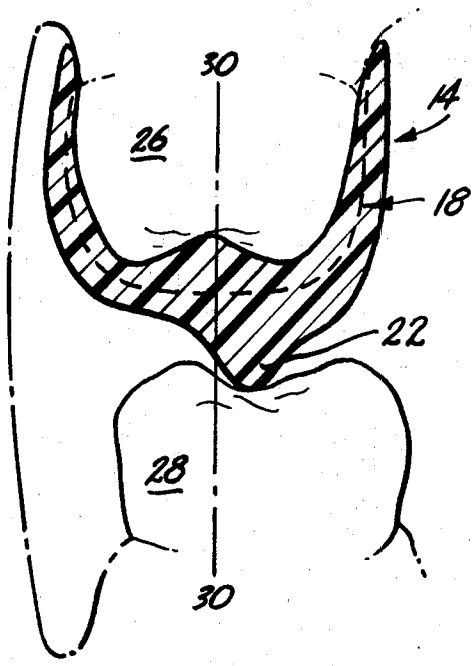


Fig. 3.

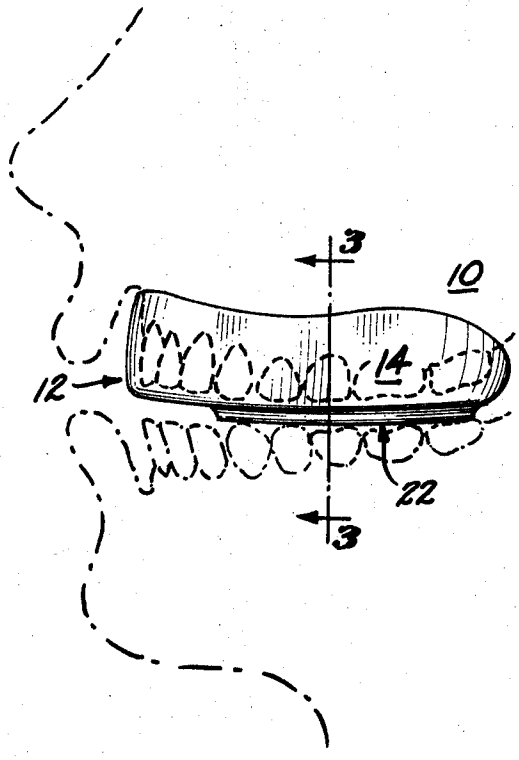


Fig. 2.

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MOUTHGUARD

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U.S. Cl. 128—136 3 Claims

ABSTRACT OF THE DISCLOSURE

A resilient U-shaped mouthguard having a fore-and-aft external resilient ridge on the posterior arm portions to be disposed between the wearer's jaw when the guard is worn to absorb shock.

CROSS REFERENCES

Applicant is a joint-patentee in U.S. Pat. No. 3,223,085 and is the applicant in co-pending U.S. application Ser. No. 679,463, filed Oct. 31, 1967.

BACKGROUND

Prior known mouthguards provide shock absorbent functions by reason of thick but compressible bases disposed between the teeth as in U.S. Pat. No. 3,223,085 or pneumatically by a compressible chamber formed in the base. Difficulty has been encountered with prior devices where the tooth contacting surface is substantially planar due to the absence of interlock between the guard and the teeth opposite those on which the guard is worn. Also, where the shock absorbent base is substantially uniform in thickness across the guard channel there is a tendency for the wearer to bite through and then destroy the effectiveness of the guard. Likewise, forces are generated when the wearer bites down that tend to displace the guard from the jaw on which it is worn, causing discomfort and requiring manual replacement.

PURPOSES

This invention has for its primary purpose the provision of firm but resilient members carried on the exterior of a mouthguard and which interlock and interfit with the teeth of the jaw opposite that on which the guard is worn, to provide shock absorbent properties with security of the guard as to placement, less bite through, and greater comfort.

THE DRAWINGS

FIG. 1 is an external plan view of the mouthguard;

FIG. 2 is a side view of the mouthguard with the jaw structure suggested by dotted lines; and

FIG. 3 is an enlarged cross-section taken on line 3—3 of FIG. 2.

DESCRIPTION

The mouthguard **10** comprises posterior portions **12** and **14** joined forwardly by anterior portion **16** to form the base member which is generally U-shaped in the manner and proportions of human jaw. In cross-section the posterior portions **12** and **14** (as shown in FIG. 3) and the anterior portion are channeled. The guard embraces the wearer's teeth of one jaw and adjacent portions of the gums.

The material from which the guard is molded desirably has resilience and conformability so that a standard molded base member will be adaptable to a reasonable range of jaw sizes and shapes, and to various tooth configurations. Preferably, the base member is molded of one of the vinyl resins, for example, although it will be apparent that rubber, polyvinyl chloride, and urethane may also be used.

The channel may contain liner **18** which can be molded to the wearer's teeth.

The novelty herein is the provision, on a conformable mouthguard base member formed of resilient material, of prominent fore-and-aft ridges **20** and **22** external of the channel bottom of each posterior portion **12** and **14**, respectively. Each ridge extends rearwardly from a location adjacent the wearer's first bicuspid as shown in FIG. 2. The prominence or mass of the ridges may be varied with respect to that shown to increase or decrease the force-absorbing characteristics. Or the material from which the ridges or concussive pads are formed may have more or a different resilience by comparison with the material of which the base member **10** is molded. It has been found possible to mold ridges of one material having a chosen durometer and fuse them to a base member having greater resilience but also substantially less durometer hardness than the ridges. Another choice is to extrude strips of material of the desired cross-section and from such cut pads longer or shorter than the mean to meet varying conditions. The fusion of the pads to the base member may be adhesively or by interaction of the materials. When fitting to the wearer occurs under conditions involving pressures, it will probably be desirable to cover the concussive pads with metallic shields that absorb pressure and prevent the pads being crushed out of shape.

As shown in FIG. 3, the guard is disposed on an upper jaw **26** and the ridge **22** is directed downward toward the lower jaw **28**. The cheek surface is to the left in FIG. 3 and the tongue is to the right. The upright plane **30—30** medially divides the upper jaw. It will be seen that the axis of ridge **22** is displaced inward of plane **30—30**, thus locating the ridge in the natural grooves and contours of lower teeth.

While the guard is shown herein as adapted for and worn on the upper jaw, it will be apparent that mouthguards may also be worn on the lower jaw **28** with effective shock-absorbing benefits. In such case, the ridges on the posterior arms **12** and **14** will desirably be located outward for an upright plane medially dividing the lower jaw whereby the ridges then are located to mate with the natural grooves and contours of the upper jaw **26**.

In FIG. 1 the fore-and-aft course of ridges **20** and **22** are shown as substantially straight. However, they may course in a slight curve in which the convexity is inward to thus accommodate a more rounded jaw structure.

It will be apparent to those skilled in the pertinent art that changes of materials may be made, the molded contours may be altered, and proportions may vary. All such as reasonably fall within the spirit and scope of the subjoined claims, giving due consideration to an appropriately liberal application of the rule of equivalents is intended to be covered by this patent.

What is claimed is:

1. A mouthguard, comprising:

a conformable base member, formed of resilient material, including a pair of posterior portions joined by an anterior portion, said base member being generally U-shaped and having a channel to embrace a wearer's jaw so that the channel bottom is disposed between the upper and lower teeth;

on each of said posterior portions of said base member and external of said channel bottom, a prominent resilient ridge, each said ridge extending posteriorly from adjacent a wearer's first bicuspid to near the rear of its associated posterior portion, and each ridge having sloping sides merging to define a ridge crest, to be disposed posteriorly-anteriorly and located to bear on the teeth of the jaw opposite that on which said mouthguard is worn.

2. The structure according to claim 1 in which the channel is adapted to be worn on the wearer's upper jaw and the axis of each said ridge is inward of the median of the posterior portion on which said ridge is located.

3. The structure according to claim 1 in which the material forming the ridge has less resilience than the material forming the base member.

References Cited

UNITED STATES PATENTS

3,103,217	9/1963	Butler et al.	128—136
3,223,085	12/1965	Gores et al.	128—136
3,293,748	12/1966	Skinner	128—62

LAWRENCE W. TRAPP, Primary Examiner