June 10, 1969 R. D. BERGHASH 3,448,738

PROTECTIVE MOUTHPIECE

Filed Dec. 19, 1966

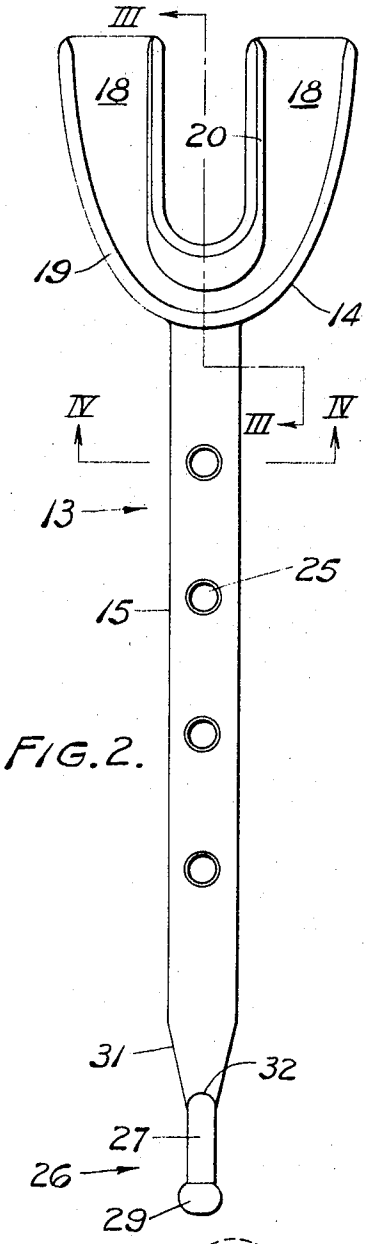


FIG. 2.

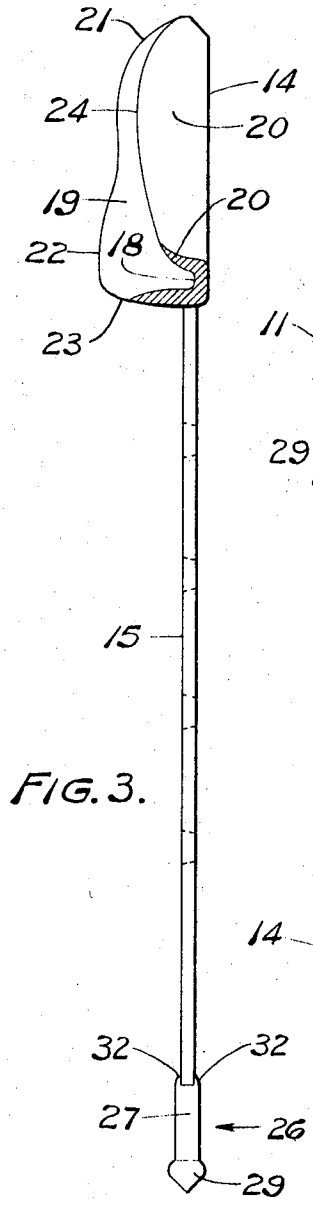


FIG. 3.

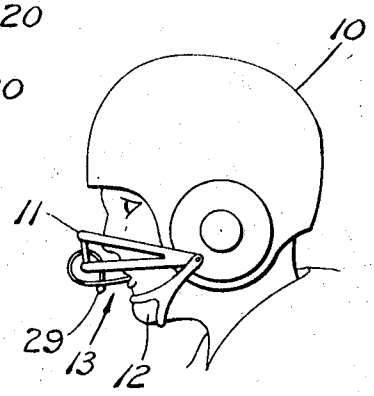


FIG. 1.

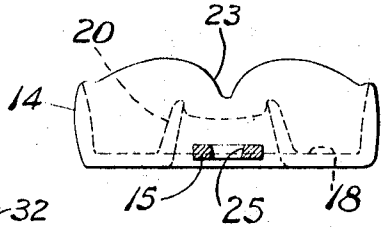


FIG. 4.

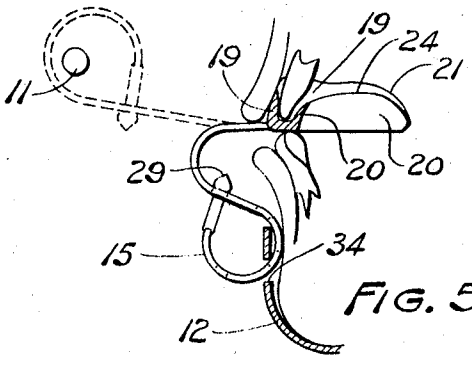


FIG. 5.

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PROTECTIVE MOUTHPIECE

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U.S. Cl. 128—136 9 Claims

ABSTRACT OF THE DISCLOSURE

An elongated fastener strap projects from a mouthguard, the strap having tapered holes spaced along its length and terminating in a reduced shank having a bulbous enlargement at its end. The fastener strap projects between the lips of a user and loops through a chin strap or about a face guard of a protective headgear with the bulbous end engaging through a tapered hole for releasably securing the mouthguard to the headgear.

Background of the invention

The present invention relates to a protective device for teeth. Specifically, the present invention relates to a mouthpiece construction having a mouthguard for protecting the teeth of a wearer engaged in strenuous physical activity, such as football, lacrosse and the like, and an improved fastener arrangement for releasably securing the mouthguard to protective headgear normally worn by those engaged in such activity.

It is known to provide a mouthguard having means for fastening to protective headgear, such as a football helmet, whereby the guard does not become separated from the user upon removal from his mouth. However, it is important to avoid discomfort and possible injury should the mouthguard be suddenly and forcibly withdrawn from its protective position about a wearer's teeth. This might occur, for example, if a headgear to which the mouthpiece is fastened is suddenly knocked off or separated from a player or if the fastener itself is inadvertently grasped and pulled by an opponent. Mouthguard fasteners requiring a predetermined orientation and manipulation for separation from the headgear and those which are subject to destructive separation are not a satisfactory solution for these reasons.

Summary of invention

It is a primary object of the present invention to provide a protective mouthpiece adapted for connection to protective headgear and releasable therefrom in an improved, nondestructive manner automatically in response to the application of a predetermined force to the fastener or headgear.

It is another object of the present invention to provide protective mouthpiece having a mouthguard and fastener which is easily and readily secured to and detached from the headgear without excessive manipulation or predetermined orientation of the fastener.

It is yet another object of the present invention to provide a protective mouthpiece having the foregoing characteristics wherein the fastener can be readily adjusted to vary the force required to connect and disconnect the mouthpiece to and from the headgear.

Other objects of the present invention are to provide a protective mouthguard and fastener combination wherein the mouthguard is quickly and easily positioned in the user's mouth, tends to remain comfortably in protective position therein and is readily and inexpensively manufactured.

In one aspect thereof, a protective mouthpiece of the present invention is characterized by a mouthguard

adapted to be disposed in protective position about a user's teeth, a fastener including an elongated flexible strap secured at one end to a central portion of the mouthguard and projecting outwardly therefrom for looping engagement about connecting portions of a headgear, the strap having an opening therethrough intermediate its ends, the other end of the strap having a connector including a reduced shank and an enlargement at the outer end of the shank, the enlargement having a maximum dimension larger than the maximum dimension of the opening whereby the latter receives the enlargement in releasable snap through engagement.

The foregoing and other advantages, objects and characterizing features of the protective mouthpiece construction of the present invention are pointed out in the following detailed description of a typical embodiment thereof considered in conjunction with the accompanying drawing depicting the same wherein like numerals represent like parts throughout the various views.

Brief description of the drawing

FIG. 1 is a side elevational view of the head of a football player showing a protective mouthpiece constructed in accordance with the present invention in protective position and fastened to the player's headgear;

FIG. 2 is an enlarged top plan view of the protective mouthpiece;

FIG. 3 is a view thereof partly in cross section and partly in side elevation, being taken about on line 3—3 of FIG. 2;

FIG. 4 is a cross sectional view thereof taken about on line 4—4 of FIG. 2; and

FIG. 5 is a fragmentary view on a reduced scale, partly in cross-section and partly in side elevation, showing the mouthguard in protective position about a wearer's teeth and illustrating two forms of attachment to the headgear.

Description of the preferred embodiment

Referring to the drawing, particularly to FIG. 1, there is shown a player wearing protective headgear in the form of a conventional football helmet **10** having a face guard **11** and a chin strap **12** and also wearing the protective mouthpiece of the present invention generally designated **13**. It will be understood that other types of headgear may be utilized in conjunction with mouthpiece **13** and that the illustrations showing the mouthpiece **13** fastened to face guard **11** and chin strap **12** (FIG. 5) are two illustrative ways of attaching the mouthpiece **13** to a helmet and are in no way intended to limit the present invention to a particular manner of attachment to a particular type of headgear.

Mouthpiece **13** is a unitary construction preferably of a synthetic plastic material formed to comprise a mouthguard **14** and a fastener strap **15**. Mouthguard **14** includes a flat, generally U-shaped, semicircular cushion **18** having leg portions laterally widening in area toward their free ends, and having rims **19** and **20** upstanding from the respective outer and inner peripheral edges thereof. As best illustrated in FIG. 3, the upper edge of outer rim **19** curves upwardly and forwardly along each side portion thereof from the rearmost portion of mouthguard **14** as indicated at **21** to midway therealong. This edge then inclines slightly upwardly and forwardly along each side portion, as indicated at **22**, and then downwardly to form a substantially V-shaped depression **23** (FIG. 4) at the front center of guard **14**.

Inner rim **20** inclines slightly inwardly as seen in FIGS. 2 and 4 and the upper edge thereof slopes upwardly and rearwardly from the central area of mouthguard **14** along each side portion thereof as indicated at **24**, terminating in downwardly sloping portions at the free ends of the legs of cushion **18**. The rims and cushion thus form a gen-

erally semicircular cavity opening upwardly through the top of mouthguard **14** for substantially protectively encasing a wearer's upper teeth with cushion **18** positioned to provide a protective barrier between the upper and lower teeth as illustrated in FIG. 5. The rims and their edges are configured to conform about opposite sides of the upper teeth with the edge along the outer rim particularly configured as at **23** to comfortably accommodate the frenum between the central portion of a wearer's upper lip and gum. While this particular configuration is considered to be desirable from many points of view, it will be appreciated that other mouthguard configurations can be used in the protective mouthpiece of this invention.

Fastener **15** extends forwardly from the front center of guard **14** in the region of cushion **18**, being spaced above the bottom portion of cushion **18** as to be positioned comfortably between a user's lips when cushion **18** is in protective position between the upper and lower teeth as seen in FIG. 5.

Fastener **15** comprises a flat band or strap substantially wider than it is thick having a plurality of circular openings **25** spaced lengthwise therealong and a connector generally designated **26** formed on its distal end. Connector **26** includes a reduced width, substantially cylindrical shank **27** extending from a laterally inwardly tapering portion of strap **15** indicated at **31** and having a bulbous enlargement **29** at its extreme end. The inner end of shank **27** is formed about opposite sides of strap **15** at the juncture of the tapered portion **31** and shank **27** to provide reinforcing fillets **32**.

Enlargement **29** is shaped to form a generally oblate spheroid having a lateral dimension in the plane of strap **15** larger than its dimension normal to the plane of strap **15** as best illustrated by comparing FIGS. 2 and 3. Openings **25** are tapered from the upper to the lower side of strap **15** (left to right as illustrated in FIG. 3). Openings **25** and enlargement **29** are formed so that the maximum dimension of enlargement **29** is larger than the maximum dimension of openings **25** with the minimum dimension of enlargement **29** approximating the maximum dimension of openings **25**. The relative shapes and sizes of enlargement **29** and openings **25** facilitate the fastening of mouthguard **14** to the headgear, and detachment therefrom, as will become apparent from the following.

In use, mouthguard **14** is inserted in the wearer's mouth with rims **19** and **20** disposed on opposite sides of his upper teeth, substantially as shown in FIG. 5, and with fastener strap **15** projecting forwardly between his lips for connection to his headgear. In fastening mouthpiece **13** to face guard **11** in the manner shown in FIG. 1 and by the broken lines of FIG. 5, fastener **15** is looped upwardly about a bar of face guard **11** so that enlargement **29** can engage through a selected tapered opening **25**. For fastening mouthpiece **13** to chin strap **12**, a slot or opening **34** is provided through chin strap **12** as illustrated in FIG. 5. Fastener **15** is then positioned behind chin strap **12** for insertion outwardly through opening **34** and thereupon looped, looped chin strap **12** so that enlargement **29** engages through a selected tapered opening **25**. In both fastening modes, fastener **15** is looped so that enlargement **29** engages through tapered openings **25** from the larger diameter side of the opening. The taper of the openings **25** thereby facilitates insertion of enlargement **29** through the selected opening **25**. The tapered outer end of bulb **29** also facilitates such insertion.

Due to the resilient nature of the plastic material forming mouthpiece **13**, the engagement of enlargement **29** through openings **25** is a snap through engagement with the area of fastener strap **15** about openings **25** resiliently yielding and deforming to permit passage of enlargement **29** through openings **25**. By providing an enlargement **29** having a lateral dimension larger than the diameter of opening **25** and a normally disposed dimension approximating the diameter of the openings, the openings need resiliently deform substantially only in one dimension upon insertion of enlargement **29** therethrough, thereby making such insertion easier by requiring less force. The same is true when withdrawing enlargament **29** through openings **25**.

With mouthpiece **13** in protective position and fastened to headgear **10** it will be seen that fastener **15** can be released by pulling fastener **15** to withdraw enlargement **29** through opening **25**. Openings **25** will resiliently deform to permit enlargement **29** to snap therethrough upon application of a predetermined force to the looped portions of fastener **15**. In this manner, fastener **15** can be manually released when desired or automatically released in response to a predetermined force applied to the looped portions thereof as when strap **15** is caught or when headgear **10** is inadvertently forcefully separated from a wearer.

By heating the area about openings **25** or by forcing a probe therethrough, the size of openings **25** can be respectfully reduced or enlarged to vary the force required for inserting and withdrawing enlargement **29** through openings **25**. Enlargement **29** remains engaged through opening **25**. They will not accidently separate regardless of their relative angular position. Also, a predetermined relative angular orientation is not required to withdraw bulb **29** through opening **25**. Openings **25** will pass bulb **29** in the unlooping disconnecting direction upon applying a predetermined force, without regard to their relative angular orientation, and such snap-through connection and disconnection can be performed repeatedly without damaging the fastener **15**. The curved form of the bulb **29** adjacent its juncture with shank **27** facilitates withdrawing the bulb through the opening.

It is thus apparent that the objects of my invention have been fulfilled. There is provided a mouthpiece which is easily and readily secured to a headgear without requiring a particular connector on the headgear, is releasable from the headgear automatically in response to a predetermined force, and can be readily adjusted to vary the force required to secure and disconnect the mouthpiece to and from the headgear. The mouthpiece can be easily and quickly inserted in a comfortable protective position about a wearer's upper teeth and is readily and inexpensively manufactured.

Having thus described and illustrated one preferred form of my invention, it will be understood that such description and illustration is by way of example only and that such modifications and changes as may suggest themselves to those skilled in the art are intended to fall within the scope of the present invention as limited only by the appended claims.

What I claim as new is:

1. A protective mouthpiece adapted to be releasably secured to a user's protective headgear comprising a mouthguard adapted to be disposed in protective position about a user's teeth, a fastener including an elongated flexible strap secured at one end to a central portion of said mouthguard and projecting outwardly therefrom for looping engagement about connecting portions of protective headgear, said strap having an opening therethrough intermediate its ends, said strap being formed at its distal end to provide a connector including a reduced width shank and an enlargement at the outer end of said shank, said enlargement being larger than said opening in all positions of relative angular orientation thereof whereby said opening receives said enlargement in releasable snap-through engagement, wherein said strap is a flat band substantially wider than thick, said enlargement comprising a bulbous enlargement extending laterally beyond said shank.

2. The combination according to claim **1** wherein said strap is a flat band substantially wider than it is thick, said enlargement having its maximum dimension in the plane of said band, and said opening being circular to accommodate passage of said enlargement therethrough.

3. The combination according to claim 1 wherein said opening tapers from one side of said strap to the other with the larger diameter portion of said opening being on the side of said strap remote from said enlargement when said enlargement is engaged through said opening.

4. The combination according to claim 1 wherein said bulbous enlargement comprises a generally oblate spheroid having its flattened axis substantially normal to the plane of said flat band.

5. A protective mouthpiece according to claim 1 wherein said opening is circular and tapers from one side to the other with the larger portion of said opening being on the side of said strap remote from said enlargement when said enlargement is engaged through said opening.

6. A protective mouthpiece according to claim 1 wherein said strap is a flat band substantially wider than thick and formed of a synthetic plastic material, said shank being substantially cylindrically shaped and having a diameter larger than the thickness of said strap, the end of said cylindrical shank remote from said enlargement having reinforcing fillets formed about opposite sides of said strap.

7. A protective mouthpiece according to claim 1 wherein said strap includes a plurality of openings spaced lengthwise therealong for selectively receiving said enlargement.

8. A protective mouthpiece according to claim 1, said mouthguard comprising a generally semicircular cushion having a pair of spaced rim portions extending upwardly from opposite edges thereof for confining at least a portion of a user's teeth therebetween.

9. A protective mouthpiece according to claim 8 wherein said strap is secured to said mouthguard in spaced relation to the undersurface of said cushion.

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U.S. Cl. X.R.

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