

[54] TENSION RELIEVER

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[52] U.S. Cl. .... **128/359; 128/1; 128/136**

[51] Int. Cl.<sup>2</sup>..... **A61J 17/00**

[58] Field of Search ..... 128/136, 359; 32/17

[56] **References Cited**

**UNITED STATES PATENTS**

3,124,129	3/1964	Grossberg .....	128/136
3,411,501	11/1968	Greenberg .....	128/136
3,457,916	7/1969	Wolicki.....	128/136
3,534,475	10/1970	Hilaire .....	32/17
3,727,309	4/1973	Huey.....	32/2

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[57] **ABSTRACT**

A device intended to be positioned in the oral cavity presenting a generally horizontal wall or flange which

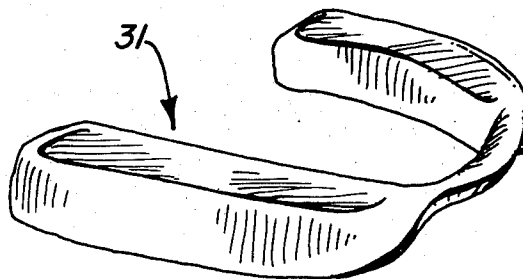
is bitten into by the teeth of both jaws when the wearer is subjected to emotional stress that generates the urge to grind or clench the teeth. This tension reliever takes two forms. One embodiment is designed for placement against the roof of the mouth and palate and inner surfaces of the teeth of the upper jaw, with the horizontal flange aforesaid extending outwardly and in engagement with the teeth cusps.

The second embodiment is intended to be fitted over the teeth of the lower jaw. It is of U-shape corresponding to the arrangement of the lower teeth and is U-shaped in cross section, presenting inner and outer walls between which extends the horizontal wall aforesaid which is cut away over the lower incisors.

Both embodiments are of a plastic, such as an acrylic, that is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity and which may be lined with a softer material such as ethyl vinyl acetate.

Also, methods of forming the embodiments which begin with a standard blank produced by a manufacturer and include subsequent steps carried out by an individual to accurately fit the tension reliever to the mouth of that individual.

**4 Claims, 15 Drawing Figures**



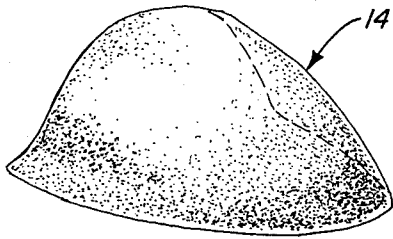


FIG. 1

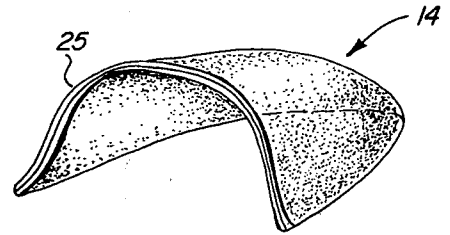


FIG. 2

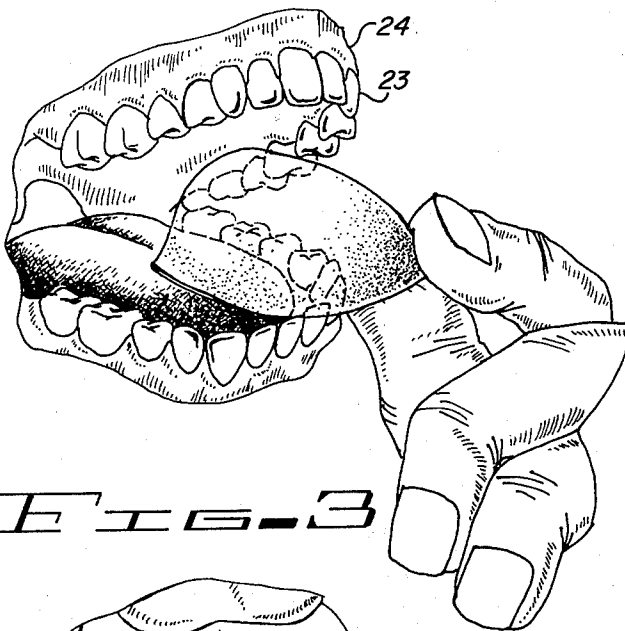


FIG. 3

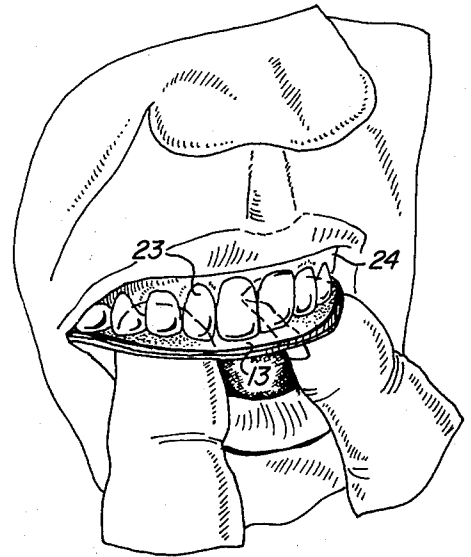


FIG. 4

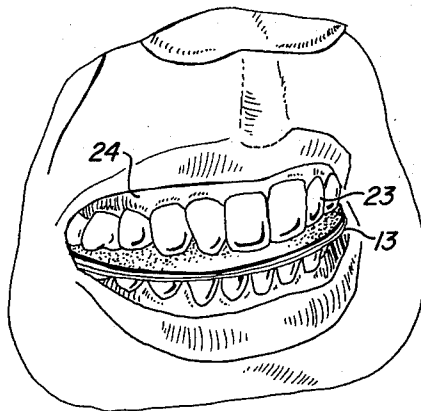


FIG. 5

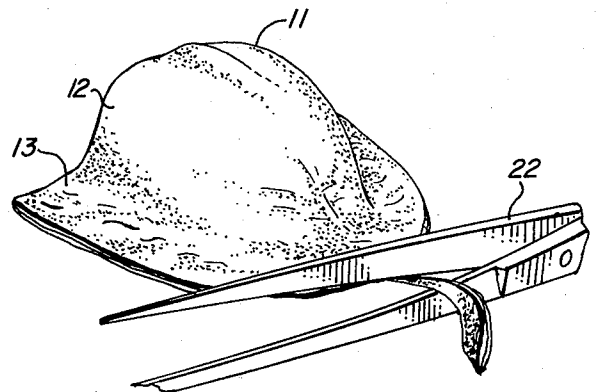


FIG. 6

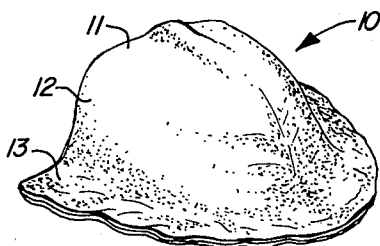


FIG. 7

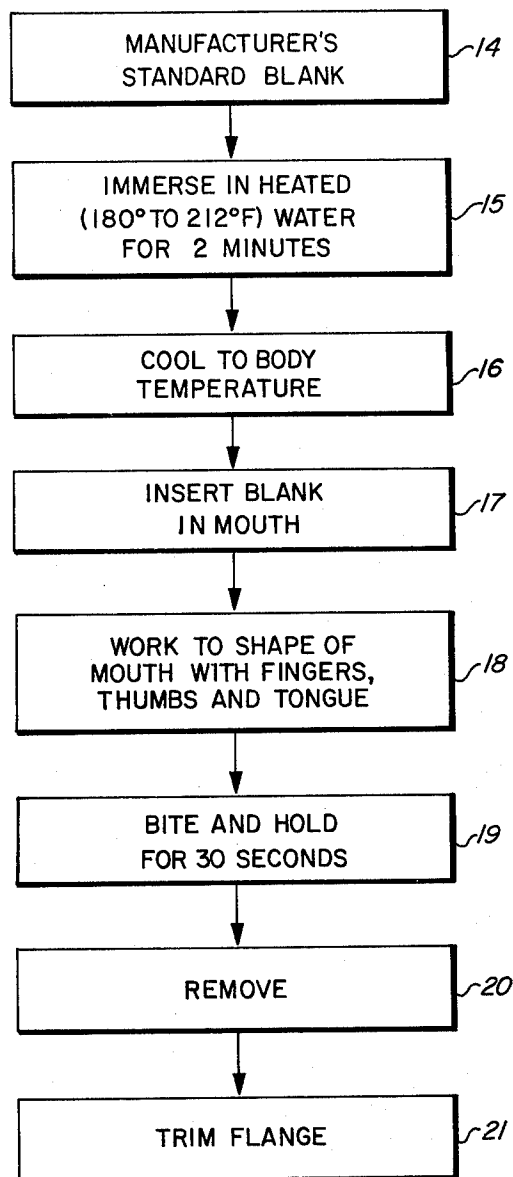


FIG. 8

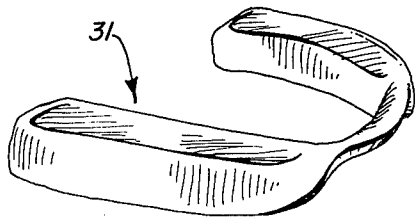


FIG. 9

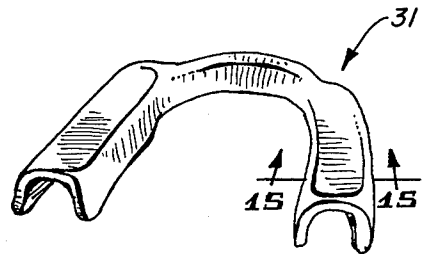


FIG. 10

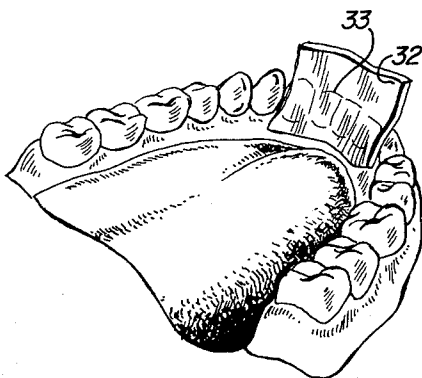


FIG. 11

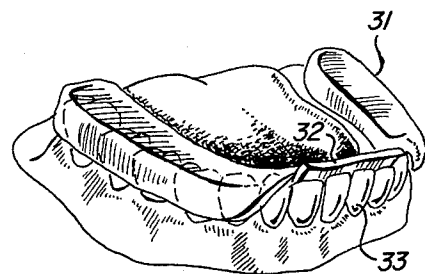


FIG. 12

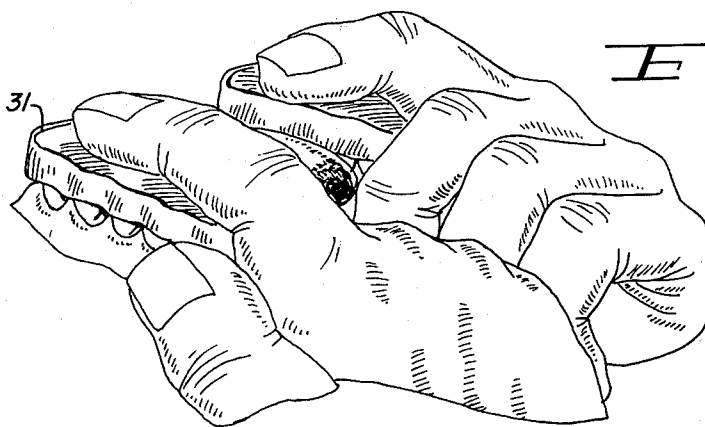


FIG. 13

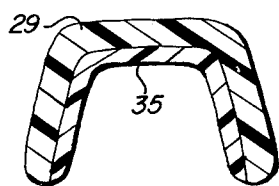


FIG. 15

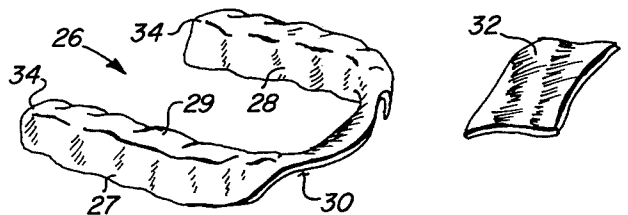


FIG. 14

## TENSION RELIEVER

The present invention relates to a tension reliever designed to inhibit headaches caused by grinding, gnashing or clenching of teeth which result in tension syndromes of the mandibular muscles which trigger spasms which are ultimately effective on the cranial nerves to create the headache, and is concerned primarily with the reliever per se, and also with methods of forming the reliever.

### BACKGROUND OF THE INVENTION

Many, if not all people, when subjected to emotional and physical stress caused by environment or work conditions, have a tendency to release such stress by clenching and/or grinding the teeth of the upper and lower jaws. This brings certain surfaces of the teeth into meeting engagement which is under pressure. Due to the angular disposition of these meeting surfaces, which will vary throughout the teeth of different individuals, camming actions are generated with anterior, posterior, lateral and vertical movement of the lower jaw relative to the upper jaw.

Any of the above movements or any combination thereof causes a displacement of the jaws which results in tension of the mandibular muscles. This camming, occlusion or bite asymmetries can result in constant stress or tension in this muscle group. Repeated episodes of spasm or repeated and prolonged tension may result in local tender muscle areas commonly called trigger points. Clenching and grinding of the teeth are manifestations of tension and/or contracture of this muscle group.

Tempromandibular joint is a medical term for the jaw joint. It includes the pterygoid muscle comprising the superior head and the inferior head. The superior head is the key which is affected by spasms or contractions of mandibular muscles to set off a chain reaction which is ultimately effective on the cranial nerves to cause headaches and similar discomfort. This discomfort may occur as spasms of the upper neck muscles, both anterior and posterior, and upper muscles of the back.

The present invention is founded on the concept of a tension reliever that provides a physical outlet for the emotional stimuli that create the tension syndrome in the mandibular muscles. A practical aspect of the methods of this invention is that they are predicated on the fact that the distance between the auxillary molars of all human adults is substantially the same, being 32 mm.

### OBJECTS OF THE INVENTION

With the foregoing conditions in mind, the present invention has in view the following objectives:

1. To provide a tension reliever that is intended for insertion into the oral cavity and which includes means for accommodating the tendency of the individual into whose mouth the reliever is inserted to grind or clench his teeth when subjected to emotional and/or physical stress.

2. To provide a tension reliever of the type noted which is of a material having a firm body consistency with slight properties of flexibility and elasticity and which includes a horizontal wall or flange that assumes a position between the teeth of the upper and lower jaws and which when bitten into by the teeth inhibits

camming actions which might cause displacement of the jaws.

3. To provide, in a tension reliever of the character aforesaid, a lining for the horizontal wall or flange which is of a material softer than the remainder of the reliever.

4. To provide a tension reliever of the kind described which is constructed and designed for insertion into the oral cavity and against the roof and palate of the mouth and against the inner surfaces of the upper teeth, with the horizontal flange aforesaid extending outwardly into a position beneath and in engagement with the cusps of the upper teeth.

5. To provide a tension reliever of the type noted which is held in position against the roof and palate of the mouth by an accurate fit, the surface tension of tissue fluids and the bite created by forcing the teeth of the jaws together.

6. To provide a method for forming a tension reliever of the character aforesaid which begins with a standard blank produced by a manufacturer, and includes subsequent steps carried out by an individual to accurately fit the blank to the mouth of that individual and which is completed by trimming away excess areas of the horizontal flange.

7. To provide a tension reliever of the kind described which is constructed and designed to be fitted over the teeth of the lower jaw and which comprises an inverted channel of U-shaped cross section presenting inner and outer generally vertical walls and a horizontal top wall which is interrupted over the lower incisors.

8. To provide a method of forming a tension reliever that is to be applied over the teeth of the lower jaw which begins with a standard blank which is produced by a manufacturer, and which includes subsequent steps of accurately fitting the reliever to the teeth of the lower jaw, and particularly the step of masking off the lower incisors as the reliever is being deformed to accurately fit the teeth of the lower jaw.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above ideas in a practical embodiment, will, in part, become apparent and, in part, be hereafter stated as the description of the invention proceeds.

### SUMMARY OF THE INVENTION

The foregoing objects are achieved by providing two embodiments of the tension reliever, one being intended for the teeth of the upper jaw and the other for the teeth of the lower jaw, together with a method of forming each embodiment.

The embodiment for the upper jaw is of plastic, such as an acrylic, that is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity. It comprises a curved top wall which conforms to the roof of the mouth and palate, a skirt integrally joined to the top wall and depending therefrom and which, when the reliever is in effective position, is in intimate engagement with the inner surfaces of the teeth of the upper jaw, and a flange integrally joined to and extending outwardly from the lower edge of the skirt and which engages the cusps of the teeth of the upper jaw. The surface of the flange which engages the teeth cusps may be lined with a material softer than this acrylic, and if desired, this lining may extend over the skirt and the top wall.

The method of forming the tension reliever aforesaid begins with a standard blank that is produced by a man-

ufacturer. After being acquired by a particular individual, it is accurately fitted to the mouth of that individual by first immersing the blank in water at a temperature ranging from about 180° to 212°F. and leaving it so immersed for a period of about two minutes. After removal from the hot water, it is permitted to cool to a temperature rendering it compatible to body temperature. It is then inserted into the mouth of the individual and is worked to bring it into accurate conformity to the contour of the mouth, roof, palate and inner surfaces of the teeth by appropriate operations of the fingers, thumbs and tongue of the individual. The jaws of the individual are then closed to create a bite which is held for approximately thirty seconds. This enables the reliever to acquire a set. It is then removed from the mouth and excess areas of the flange removed by trimming.

The second embodiment comprises an inverted channel member of U-shaped cross section and of a plastic, such as an acrylic, that is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity. The channel member presents generally vertical inner and outer walls which are joined at their top edges by a top wall which is interrupted or omitted over the lower incisors. The undersurface of this top wall may be lined with a material softer than the acrylic and this lining may be continued throughout the inner surfaces of the vertical walls.

The method of forming the tension reliever for the teeth of the lower jaw is substantially the same as that above described for the reliever for the teeth of the upper jaw, in that it begins with a standard blank that is produced by a manufacturer and includes subsequent steps of shaping the blank to accurately conform it to the mouth of that particular user, with two notable exceptions. One of these is the step of masking off the lower incisors before or as the blank is inserted into the mouth of the user as by a sheet of wax of appropriate dimensions, and the other exception is changing the final step of trimming from that of removing excess areas of the flange to removing excess portions of the ends of the reliever where they extend beyond the back cusps of the lower jaw.

For a full and more complete understanding of the invention, reference may be had to the following description and the accompanying drawings wherein:

FIG. 1 is a perspective looking at the upper side of a standard blank from which the tension reliever for the teeth of the upper jaw is fashioned;

FIG. 2 is another perspective looking from the inner end of the blank of FIG. 1;

FIG. 3 is a perspective depicting the insertion of the blank into the mouth of an individual;

FIG. 4 is another perspective showing how the blank is worked by a finger and thumb of the individual to whom it is fitted;

FIG. 5 is another perspective looking at the face of the individual and depicting the bite which is the final step of the mouth conforming operations;

FIG. 6 is another perspective showing the final step of trimming the horizontal flange;

FIG. 7 is still another perspective looking at the top of the finished tension reliever;

FIG. 8 is a flow sheet diagrammatically depicting the steps of the forming operations;

FIG. 9 is a perspective looking at the top of a blank for a tension reliever for the teeth of the lower jaw;

FIG. 10 is another perspective looking from the inner side of the blank of FIG. 9;

FIG. 11 is another perspective looking down on the teeth of the lower jaw and illustrating the step of masking off the lower incisors;

FIG. 12 is a perspective showing the blank of FIGS. 9 and 10 as positioned over the teeth of the lower jaw with the masking element in place;

FIG. 13 is still another perspective illustrating the working of the blank by a finger and thumb of the individual to whom it is being fitted;

FIG. 14 is another perspective showing the formed reliever and masking blank which is discarded in exploded relation, and

FIG. 15 is a transverse vertical section through a portion of the blank, being taken on the plane of the line 15-15 of FIG. 10.

#### DESCRIPTION OF THE FIRST EMBODIMENT

Referring now to the drawings, wherein like reference characters denote corresponding elements throughout the several views, and first more particularly to FIG. 7, the embodiment designed for insertion into the oral cavity in engagement with the roof and palate will be described. FIG. 7 illustrates the finished tension reliever. It is identified in its entirety by the reference character 10 and comprises a top wall 11 from which depends a skirt 12 which is integrally joined therewith and a generally horizontal flange 13 which extends outwardly from the lower edge of skirt 12 to which it is integrally joined.

The reliever 10 may be of any plastic which is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity. Certain acrylics now used in the dental profession are known and have these properties. When inserted into the mouth of the individual to whom it is fitted, the top wall 11 and the upper portions of the skirt 12 accurately conform to the contour of the roof and palate of that individual's mouth. The lower portions of skirt 12 accurately conform to the inner surfaces of the teeth of the upper jaw and the flange 13 is dimensioned to underlie the cusps of the teeth of the upper jaw.

Referring now more particularly to FIGS. 1-6 inclusive, which may be considered along with FIG. 8, the method of forming the tension reliever 10 will be described. FIG. 1 illustrates a blank 14 of a standard size which will be produced by a manufacturer. The use of such a standard blank is not only possible, but entirely practical, due to the fact that the distance between the maxillary molars of most human adults is substantially the same, being 32 mm.

Referring now to FIG. 8, the second step of the subject method is to immerse the blank 14 into water which has been heated to a temperature ranging from 180° to 212° F. and leaving it so immersed for a period of about 2 minutes. This step is represented by the block 15. This heating of the blank renders it workable so that it may be fashioned into the required shape. After being removed from the heated water, it is cooled to a temperature which is compatible to the human body. This step is represented by the block 15. Even though it has been somewhat cooled, it is still workable. It is then inserted into the mouth of the individual for whom it is being fitted, as illustrated in FIG. 3 and represented by block 17. After being so inserted, it is worked into a shape accurately conforming to the roof and palate of the mouth and inner surfaces of the teeth

of the upper jaw. This step is illustrated by block 18 and is carried out by the fingers and thumbs of the person performing the working, which ordinarily will be the individual who purchased the blank, and may be supplemented by manipulation of the tongue.

After being worked into an accurate fit, flange 13 is bitten into by the teeth of both jaws. This step is represented by the block 19 and it is notable that the bite is held for a period of approximately thirty seconds which is sufficient to allow the reliever to acquire a "set," and thus retain its shape. The bite of block 19 is illustrated in FIG. 5. The formed and set reliever is then removed from the mouth as represented by block 20 and the flange is trimmed as indicated by block 21. This trimming of the flange is illustrated in FIG. 6 and may be achieved by any appropriate instrument, such as a pair of scissors, as indicated at 22.

While it is believed that certain of the acrylics now available to those working in the dental profession will have the properties required of the subject tension reliever, if desired, the surface of flange 13 which engages the cusps of teeth 23 of upper jaw 24 may be lined with a layer of a material softer than the acrylic from which reliever 10 is made and which has a lower melting point than such acrylic. Ethyl vinyl acetate is an example of such a material. If such a lining is used, it is important that it cover the upper surface of flange 13. However, it may extend throughout the entire upper surface of the reliever 10 as illustrated in FIG. 2, wherein it is designated 25.

#### DESCRIPTION OF THE SECOND EMBODIMENT

Referring now to FIGS. 9-15 inclusive, the tension reliever intended for application to the teeth of the lower jaw will be described. The finished reliever is illustrated in FIG. 14 and is identified in its entirety by the reference character 26. It comprises a generally U-shaped channel member which conforms to the arrangement of the teeth of the lower jaw. This channel member is U-shaped in cross section presenting an outer wall 27 and an inner wall 28 which are generally vertical and to the upper edges of which is integrally joined a top wall 29. It is important to note that the top wall 29 is cut away or interrupted over the lower incisors as represented by the space 30 in FIG. 14. This interruption is of importance because it permits the upper incisors to pass over and partially overlap the lower incisors which is the condition of the normal bite for most humans.

Like the tension reliever 10, the reliever 26 is of a plastic that is thermosetting and at body temperature is firm with slight properties of flexibility and elasticity. Certain of the acrylics now available to the dental profession are suitable for this purpose.

The method of forming the tension reliever 26 is substantially the same as the method of forming reliever 10, with certain notable exceptions which will become apparent from the following description. In describing this method, the flow sheet of FIG. 8 is referred to because of the fact that many of the steps are common to the two methods.

Referring now to FIG. 8, along with FIGS. 9-14, the initial step is the same. Thus, a blank 31 is produced by a manufacturer in standard size, due to the uniformity of the dimensions of the mouth of human adults. Block 15 of FIG. 8 is repeated in the method for reliever 26. Thus, the blank 31 is immersed in water heated to a temperature from 180° to 212° F. and left so immersed

for about 2 minutes. It is then cooled to a temperature compatible with the human body as indicated by block 16 of FIG. 8.

At this point the method for reliever 26 differs from that of reliever 10. As shown in FIG. 11, a masking element 32 is inserted behind and over the cusps of lower incisors 33. Many materials may be employed as the masking element, but a piece of wax of appropriate dimension is indicated as being preferred.

After the masking element 32 is positioned, blank 31 is inserted into the mouth and positioned over all of the teeth of the lower jaw as illustrated in FIG. 12 and represented by the block 17 of FIG. 8. The blank is then worked by thumbs and fingers of the user as illustrated in FIG. 13 and represented by the block 18. The teeth of the upper and lower jaws are then moved together to create a bite which is held for about 30 seconds as represented by the block 19 of FIG. 8. It is notable that this bite does not obtain between the incisors as above pointed out. The formed and set reliever is then removed from the mouth as indicated by block 20 of FIG. 8, but at this point the final steps of the two methods differ. In the method for reliever 10, the flange 13 is trimmed. In the method for reliever 26, the free ends of the U-shaped channel member indicated at 34 are trimmed so that the top wall 29 does not extend beyond the back of the lower molars.

Like the reliever 10, the inner or lower surface of top wall 29 may be lined with a material softer than and having a lower melting point than the acrylic aforesaid, ethyl vinyl acetate being an example of such a material. As shown in FIG. 15, this lining is represented at 35 and may be continued over the inner faces of vertical walls 27 and 28.

While preferred specific embodiments are herein disclosed, it is to be clearly understood that the invention is not to be limited to the exact constructions, materials and steps illustrated and described because various modifications of these details may be provided in putting the invention into practice.

What is claimed is:

1. In a tension reliever intended to be positioned in the oral cavity of the mouth of a person, said mouth presenting a lower set of teeth including incisors in the front central portion thereof, said tension reliever being intended for application to said lower set of teeth;

a. a one piece integral wall structure of a plastic that is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity;

b. said wall structure including a horizontal wall adapted to engage the teeth of said lower set;

c. an inner wall integral with and depending from said horizontal wall, said inner wall adapted to engage inner surfaces of the teeth of said lower set when the tension reliever is in effective position;

d. an outer wall integral with and depending from said horizontal wall, said outer wall adapted to engage outer surfaces of the teeth of said lower set when the tension reliever is in effective position, said outer wall being interrupted at the front central portion thereof to provide a space thereat;

whereby said horizontal, inner and outer walls define a channel to receive the teeth of said lower set to maintain said tension reliever in effective position.

2. The tension reliever of claim 1 in which the plastic is acrylic.

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3. The tension reliever of claim 2 in which the lower surface of the horizontal wall is lined by a layer of material which is softer than and has a melting point lower than that of said acrylic.

4. The tension reliever of claim 3 in which said layer of material is ethyl vinyl acetate.

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