Jan. 21, 1964 V. R. TRAPOZZANO 3,118,230

DENTAL ARTICULATING DEVICES

Filed May 25, 1962

FIG. 1.

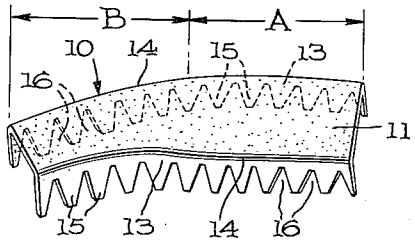


FIG. 2.

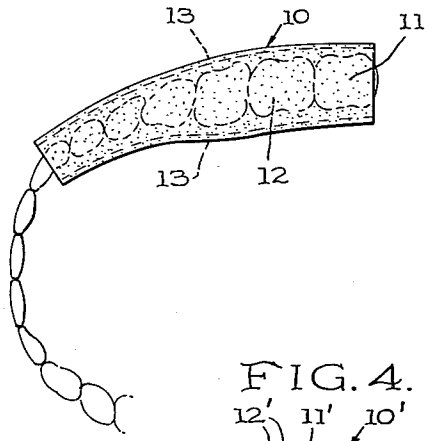


FIG. 3.

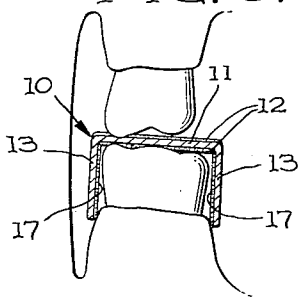


FIG. 4.

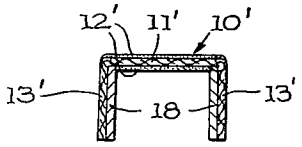


FIG. 5.

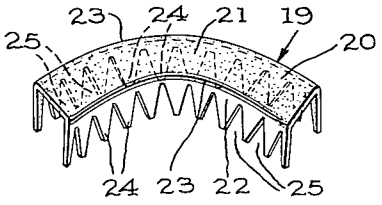


FIG. 6.

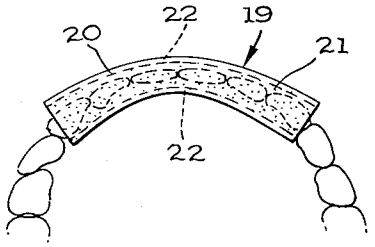
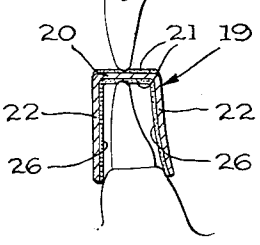


FIG. 7.



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DENTAL ARTICULATING DEVICES

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This invention relates to dental articulating strips, sometimes called high spot markers.

Conventional articulating strips commonly employed by dentists for marking high spots on the occlusal surfaces of the posterior teeth and the incisal edges of the anterior teeth are thin straight and flat strips of thin paper coated on both sides with a vegetable wax mixed with harmless coloring matter. The dentist positions the articulating strip between the occlusal surfaces or incisal edges of the upper and lower teeth and the patient is told to bite the strip and upon removal of the strip from the mouth, the high spots on the teeth are marked with the colored coating material so that the dentist may operate properly upon these high spots by grinding them down, etc. Difficulty is experienced in the use of these conventional paper or cloth articulating strips in that they are difficult to position properly with relation to the teeth and they tend to move readily from their proper positions and require handling and constant adjustment by the dentist. An even more important disadvantage of the conventional strips is that they tend to wrinkle or become crimped adjacent the occlusal surfaces and incisal edges of the teeth, resulting in inaccurate high spot marking and other difficulties. Sometimes the conventional cloth or paper articulating strips are made horseshoe-shaped to conform generally to the shape of the dental arch, but these thin flat strips are still subject, to a great extent, to the above-mentioned difficulties and are not entirely satisfactory.

Another procedure employed at the present time for the same purpose is to introduce strips or sheets of wax material between the upper and lower teeth and to have the patient bite the wax material which, after removal from the mouth, indicates the high spots on the occlusal surfaces or incisal edges by the relative degree of penetration of the teeth into the wax material. This penetration method does not mark the teeth and is a much more inaccurate method of indicating the high spots but possesses the advantage over the aforementioned paper and cloth marking strips that the wax strips do not tend to move relative to the teeth or to wrinkle or become crimped. Sometimes the wax strips bear an adhesive coating on one side thereof for adherence to the teeth and the adjacent soft tissue structure of the gums, and the wax strips in this instance may be wrapped over the tooth or teeth to be tested. However, as stated, the wax penetration method of indicating the high spots on the teeth without directly marking the teeth is inferior to the method of marking the high spots directly with coloring material.

The object of the present invention is therefore to provide a dental articulating device which overcomes completely the above-mentioned deficiencies of the prior art by the provision of means having the admirable qualities of each of the aforementioned high spot testing methods without the disadvantages or deficiencies inherent in the same.

More particularly, the object of the invention is to provide preformed or tailored articulating strips to be made in various sizes and segments to fit over the posterior and anterior teeth and to remain properly positioned without movement during use and without the tendency for wrinkling or crimping adjacent to the occlusal surfaces and incisal edges of the teeth, and being capable of directly marking the high spots of the upper and lower

teeth, either natural or artificial, by means of coloring material.

Another object of the invention is to provide tailored articulating strips or segments having scalloped or serrated marginal flanges which may be reinforced for stiffening the structure and coated on their inner sides with adhesive, if preferred, and tending to eliminate all wrinkling or crimping and to prevent unwanted movement of the strips relative to the teeth.

A further and more general object of the invention is to provide dental articulating devices or strips, the use of which will save a great deal of the dentist's time and render much more uniformly accurate results in indicating the high spots on the teeth, regardless of whether the teeth being tested are the posterior teeth or the anterior teeth.

Another object is to provide dental articulating strips of the above-mentioned character which may be formed of various materials or combinations of materials such as paper, linen, silk, and synthetic fabrics, and which may be made in various colors to mark the teeth accordingly.

Further objects are to provide articulating strips which are inexpensive to manufacture, easy to use and reliable and efficient in operation.

Other objects and advantages of the invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a perspective view of a posterior segment of a dental articulating strip according to the invention,

FIGURE 2 is a top plan view of the same during use, partly diagrammatic,

FIGURE 3 is an enlarged cross sectional view through the articulating strip segment shown in FIGURES 1 and 2,

FIGURE 4 is a similar cross sectional view showing a modification of the invention,

FIGURE 5 is a perspective view of an anterior segment of the dental articulating strip according to the invention,

FIGURE 6 is a top plan view of the same illustrating its use in conjunction with the anterior teeth, and

FIGURE 7 is an enlarged cross sectional view of the strip segment shown in FIGURES 5 and 6.

In the drawings, wherein for the purpose of illustration are shown preferred embodiments of the invention, attention is directed first to FIGURES 1 through 3, wherein the numeral 10 designates generally a preformed posterior segment of a dental articulating strip formed of paper, natural or synthetic fabric, or the like. The segment 10 is somewhat irregular in shape, as shown, to conform generally to the curvature of the dental arch adjacent to the molars and bicuspids. More specifically, the segment 10 includes a flat horizontal wall 11 adapted during use to engage between the occlusal surfaces of the posterior teeth including the molars and bicuspids as shown approximately in FIGURE 2. The flat wall 11 is coated on both sides thereof as indicated at 12 with a conventional vegetable wax substance containing a harmless coloring material for marking the high spots of the occlusal surfaces of the posterior teeth. The coating material is conventional and well-known in the art.

The segment 10 further comprises substantially vertical downturned side flanges 13, integral with the horizontal wall 11 and foldable with relation thereto along longitudinal fold lines 14 extending for the entire length of the segment 10. The segment 10 therefore constitutes an open ended channel-like member of somewhat irregular cross section adapted to fit over the lower posterior teeth during use as shown approximately in FIGURE 2.

The depending flanges 13 of segment 10 are scalloped or serrated throughout their entire lengths to form thereon a plurality of substantially uniformly sized and spaced tapered projections 15 and alternately arranged oppositely tapering recesses 16. These projections and recesses have their upper ends terminating near and below the fold lines 14, as shown, preferably about 1/16 of an inch therebelow.

Preferably, as shown in Figure 3, the depending flanges 13 are somewhat thicker than the horizontal wall 11 to add increased rigidity or stiffness to the channel-like structure and to prevent wrinkling or crimping of the flat wall 11 which engages the occlusal surfaces of the teeth. This increased thickness for the flanges 13 may be achieved in different ways, such as by laminating additional strips of paper, fabric or other material to the basic sheet material from which the segment 10 is constructed or by otherwise building up the flanges 13 to increase the thickness and strength thereof. The scalloped construction of the flanges 13 prevents the same from wrinkling or crimping during the bending thereof and this construction allows the flanges to conform to the curvature of the dental arch without crimping or wrinkling.

As shown in FIGURES 1 and 2, the rear portion of the channel-shaped segment 10 is wider than the forward portion thereof to accommodate the relatively wide molars. The relatively narrow forward portion of the segment 10 is designed and shaped to accommodate the bicuspids which are relatively narrower than the molars, as shown. In the region of the segment designated "A," FIGURE 1, the flat wall 11 is of substantially uniform width between the flanges 13, whereas in the region designated "B," the flat wall 11 becomes gradually narrower toward the forward end of the segment 10 and the shape or curvature of the segment is non-uniform as indicated to conform to the natural dental arch. The overall height or depth of the channel-shaped segment 10 is preferably uniform, as shown.

The inner faces of the side flanges 13 may be coated at 17, FIGURE 3, with a well known adhesive composition to allow the flanges to adhere somewhat to the sides of the teeth and adjacent soft tissue of the gums. This further aids in fixedly positioning the articulating strip or segment relative to the teeth during use.

FIGURE 4 shows in cross section a modification of the segment 10, designated 10'. The channel-shaped segment 10' may be formed of cloth, such as linen, silk or the like, and includes a top horizontal wall 11', coated on both faces at 12' with the colored waxy material employed to mark the teeth, as described previously in connection with FIGURES 1–3. The depending side flanges 13' of the segment 10', FIGURE 4, are reinforced and stiffened upon their inner faces by stiff strip elements 18, formed of paper or the like, and secured thereto adhesively, by stitching or by other suitable means. The flanges 13' and their reinforcing strips 18 are scalloped in the identical manner shown and described in connection with FIGURE 1 and for the same purpose. The flanges 13' serve to position the segment 10' upon the teeth without wrinkling of the flat wall 11' in the same manner described in connection with FIGURES 1–3, and all other parts of the invention shown in FIGURE 4 are otherwise identical in construction and operation with the corresponding parts shown and described in connection with FIGURES 1 through 3. If desired, the interior faces of the stiffening strips 18 may be coated with adhesive in the same manner and for the purpose specified in connection with the adhesive coating 17 in FIGURE 3.

FIGURES 5 through 7 show a preformed anterior segment of a dental articulating strip for application to the anterior teeth for testing and locating high spots on the incisal edges thereof. This anterior segment is designated generally by the numeral 19 and may be formed in its entirety of paper, cloth or the other materials mentioned in the prior forms of the invention. The construction

and mode of use of the segment 19 is generally similar to that of the posterior segment 10. The segment 19 includes an arcuate flat horizontal wall 20 to engage the incisal edges of the lower and upper anterior teeth, and this wall is coated upon opposite sides as at 21, FIGURE 7, with the waxy colored tooth marking material previously mentioned. The segment 19 is channel-shaped and open ended to fit over the anterior teeth as shown in FIGURE 6 and includes depending vertical side flanges 22, integral therewith, and foldable along longitudinal fold lines 23 adjacent the opposite arcuate edges of the flat wall 20. The flanges 22 are serrated or scalloped throughout their lengths in approximately the manner previously described in the prior forms of the invention. However, in connection with the segment 19, due to its more abrupt curvature to conform to the dental arch of the anterior teeth, a greater number of tapered projections 24 and a correspondingly greater number of alternate oppositely tapering recesses 25 are formed upon the side flanges 22, with the tops of the projections and recesses terminating approximately 1/16 of an inch or the like below the fold lines 23, as shown. As shown in FIGURES 5 and 6, the anterior segment 19 is symmetrical about its center of curvature and of substantially uniform width between the side flanges 22, as distinguished from the irregular shape and curvature of the posterior segment 10.

The side flanges 22 may be formed somewhat thicker than the flat wall 20 to render the device more rigid and more resistant to wrinkling and crimping, or the side flanges 22 may be reinforced by separate laminating strips in the same manner described in connection with FIGURES 1–3 and FIGURE 4. The interior faces of the flanges 22 may be coated with adhesive at 26 in the same manner and for the purpose described previously in the prior forms of the invention. The anterior segment 19 of the articulating device may be formed of various materials other than paper as previously stated.

Both the posterior and anterior segments 10 and 19 may be manufactured in various sizes to meet the requirements of tooth size and dental arch structure encountered with various dental patients. In any event, the preformed posterior segments 10 and anterior segments 19 will be constructed in the manner shown in the drawings to accommodate the posterior and anterior teeth and to conform approximately to the average shape of the dental arch in these regions, and variations will be in size only and not in structural shape or mode of use.

During use, the posterior segments 10 or the anterior segment 19 may be conveniently applied by the dentist over the upper or lower posterior teeth or upper or lower anterior teeth as found desirable, FIGURES 2 and 6. The adhesive coated side flanges of the channel-like segments may contact the sides of the teeth and/or the gum tissue to further fixedly position the segment relative to the teeth. The patient is instructed to bite naturally upon the flat coated wall 11 or 20 of the segment between the occlusal surfaces of the posterior teeth or between the incisal edges of the anterior teeth. Upon opening of the mouth and removal of the segment or 10 or 19 by the dentist, clear markings are made upon the high spots, if any, of the teeth by the colored coating material 12 or 21.

There is little or no tendency for the segments 10 and 19 to shift relative to the teeth during the above testing operation because the segments are contoured to fit the teeth and to conform to the curvature of the dental arch, as stated. Likewise, there is no tendency for the coated flat wall 11 or 20 to wrinkle or become crimped, due to the channel-like formation of the segment and the strengthening or stiffening effect of the scalloped side flanges 13 and 22. Thus, the invention completely overcomes the most glaring defects of the conventional flat articulating strips which are subject to much movement and wrinkling during use and yet successfully utilizes the most advantageous feature of the conventional strips

in directly marking the teeth with coloring material. In like manner, the invention eliminates the defect of conventional wax impression strips which are somewhat inaccurate in detecting high spots by measuring the degree of penetration of the wax, and the invention also achieves the advantage of the wax strips in that the invention does not tend to move or become displaced during use. The non-wrinkling and non-crimping characteristic of the present invention afforded by the scalloped side flanges 13 and 22 and the tendency for the working wall or surface directly between the teeth to remain flat is a characteristic of the invention which cannot be achieved by any of the known prior art dental articulating means.

It is to be understood that the forms of the invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

I claim:

1. A dental high spot marker comprising an elongated longitudinally curved element formed of sheet material and being channel-shaped in cross section and having a main flat web for disposition between the meeting faces of upper and lower teeth, tooth marking material on opposite sides of the main flat web for directly marking high spots on the upper and lower teeth, the channel-shaped element including longitudinal side flanges projecting beyond one face only of said web and being scalloped throughout the length of the flanges to form thereon a multiplicity of alternating projections and spaces.

2. The invention as defined by claim 1, and wherein said sides flanges are formed of thicker material than said web.

3. The invention as defined by claim 2, and an adhesive coating on the inner faces of said side flanges for adherence to the side walls of teeth and adjacent gum tissue.

4. The invention as defined by claim 1, and wherein said channel-shaped element is formed in its entirety from thin sheet material, and separately formed relatively stiff reinforcing strips secured to said side flanges to reinforce the same and to render the side flanges relatively stiff.

5. A posterior dental articulating segment for testing high spots on the posterior teeth comprising a unitary strip body portion formed of sheet material and being substantially channel-shaped in cross section and having a main web for disposition between the occlusal surfaces of the upper and lower posterior teeth and dependent scalloped side flanges adapted to straddle the lower posterior teeth during use, colored coating material on the opposite faces of said main web adapted to visibly mark high spots on said occlusal surfaces, said channel-shaped strip body portion being irregularly curved and tapering somewhat forwardly from its rear end toward its forward end to conform substantially to the shape of the dental arch along the posterior teeth and to acommodate the relatively wide molars near the rear end of the body portion and the relatively narrow bicuspids near the forward end thereof.

6. The invention as defined by claim 5, and adhesive material on the inner faces of said side flanges.

7. An anterior dental articulating segment for testing high spots on the anterior teeth comprising a unitary strip body portion formed of sheet material and being channel-shaped in cross section and having a main web for disposition between the incisal edges of the upper and lower anterior teeth and dependent scalloped side flanges adapted to straddle the lower anterior teeth during use, high spot coloring material on the opposite faces of said main web, said channel-shaped body portion being substantially uniformly curved throughout its length to conform to the curvature of the dental arch adjacent the anterior teeth, the side flanges being substantially uniformly spaced along the length of said body portion to accommodate the anterior teeth between them.

8. The invention as defined by claim 7, and an adhesive coating on the inner faces of the side flanges.

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