A tooth positioning and retaining appliance which is preformed and includes a molded arch-shaped body of resilient material having upper and lower archways to receive upper and lower arches of a person. Each archway includes a plurality of tooth sockets arranged in ideal arch relationship and preselected positions to urge the teeth received thereby into the preselected positions. Retention means in the form of relatively rigid projections are anchored in at least one of the arches for engagement in the embrasure or interproximal areas of the teeth to assist in orienting and retaining the appliance in position.

5 Claims, 4 Drawing Figures
3,837,081

PREFORMED TOOTH POSITIONING AND RETAINING APPLIANCE

This invention relates in general to a tooth positioning appliance used in orthodontic treatment usually as a final treatment step, and more particularly to a tooth positioning and retaining appliance which is preformed with tooth sockets arranged in ideal positions and includes retention means for assisting in orienting and retaining the positioner in the mouth of the wearer.

Tooth positioning appliances of the type like the present invention are used in the final stages of the removal of fixed appliances to complete treatment. Therefore, such appliances having spring means for assisting in orientating and positioning the appliance in the mouth of the wearer have been known as in U.S. Pat. No. 3,178,820. Such tooth positioning appliances have been custom made for a particular patient where it has been necessary to fabricate the appliance following the impressions in the mouth of the patient, thereby creating a lapse of time between the initial need for the appliance and the actual placement of the appliance in the patient's mouth. It has also been heretofore proposed to provide preformed tooth positioning appliances which may be ordered in various sizes so that when the need arises for the appliance, the appliance may be immediately fitted in place. However, these appliances have not included rigid means, such as seating spring clips, for assisting in placement and retention in the user's mouth, as disclosed in the above-mentioned patent.

The present invention would obviate the problem of ordering a custom-made tooth positioning appliance with seating springs by providing to the orthodontist ready-made tooth positioning appliances with seating springs of a sufficient number of sizes so that when the need arose, an appliance with seating springs could immediately be placed in the patient's mouth. Moreover, the cost of such an appliance would be substantially less than a custom-made appliance, as such an appliance could be mass-produced from molds that could be used over and over again. The seating springs which may be of metal such as spring wire, if necessary, could easily be slightly bent to insure proper fit in a patient's mouth at the time of placement.

It is therefore an object of the present invention to provide a preformed tooth positioning and retaining appliance having seating springs for assisting in orienting and retaining the appliance in the mouth of the patient, and which would enable immediate placement of the appliance and the savings of costs.

Other objects, features and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheet of drawings, wherein like reference numerals refer to like parts, in which:

FIG. 1 is a perspective view of a tooth positioning and retaining appliance according to the present invention;

FIG. 2 is an enlarged transverse sectional view taken substantially along line 2-2 of FIG. 1;

FIG. 3 is a perspective view of a seating spring which has been removed from the positioner to show its full contour; and

FIG. 4 is a fragmentary side elevational view of a positioner and the teeth of a patient and illustrating the manner in which the seating springs seat in the embrasure or interproximal areas of the teeth.

The tooth positioning and retaining appliance of the present invention is preformed or ready-made for the orthodontist so that upon removal of the fixed appliances from a patient's teeth an appliance of the present invention can be immediately fitted to the patient to eliminate the usual time taken to have a custom-made appliance with seating springs produced. Moreover, the appliance of the invention can be mass-produced and thereby made more inexpensively. The appliance of the invention would include an arch-shaped body having an upper and lower archway with tooth sockets arranged to accept typically sized teeth and to have spring means or seating springs in at least one of the archways for coacting with the embrasure or interproximal areas of teeth, preferably in the molar area to assist in positioning and retaining the appliance in the mouth of the patient.

The seating springs comprise spring-like members having arms engaging in embrasure areas of the teeth that assist in placement by indicating to the patient when the positioner is properly in place on the teeth. Thereafter, when it is placed and the seating springs in seated position, the springs assist in retaining the positioner in the proper place for best action with respect to functioning on the teeth. The seating springs may be placed in a variety of areas along the arch, but preferably they are placed in the buccal segments. Then it will be appreciated that one end of each seating spring will fit into the buccal embrasure, while the other end will engage in the lingual embrasure. Since the ends of the springs are projecting toward each other, it is necessary that they be deflected apart during placement, after which they close again gingival to the greatest contours of the respective adjacent teeth. Moreover, the seating springs can be placed in all four quadrants of the positioning appliance, but they usually are only in the upper arch.

Referring now to the drawings, the tooth positioning and retaining appliance of the invention includes a resilient arch-shaped body 10 having upper and lower archways 11 and 12. Specifically, the body may be made of any suitable natural or synthetic rubber or of a suitable plastic. The upper archway 11 includes a plurality of tooth sockets 13, while the lower archway 12 includes a plurality of tooth sockets 14. It should be appreciated that the ready-made or preformed positioning and retaining appliance of the invention would have the tooth sockets arranged in an ideal arch relationship relative to both the upper and lower arches, so as to apply the necessary forces to the teeth of the wearer that would bring the teeth into the desired ultimate position. Moreover, the number of tooth sockets would be of the usual type encountered by patients so that there would be maximum mating engagement between all of the teeth of the patient and sockets in the appliance. It can also be seen that an orthodontist would have several sizes of the preformed positioning appliances so that the patient could be fitted with the one most closely fitting the arches and teeth to provide the maximum benefit.

Each of the tooth sockets as shown in FIG. 2 includes a bottom wall 18 and opposed side walls 19 which extend upwardly from the opposite edges of the bottom walls, and while it may be appreciated that a positioning appliance may be made with only tooth sockets
which will accommodate a part of the teeth of any arch, it is preferred that the number of tooth sockets or partial sockets equal that of the teeth in the arch of a patient in order to give maximum results in using the positioning appliance.

The spring means or precision seating springs that assist in placement and retention of the positioning appliance in the mouth of the patient are generally designated by the numeral 25 and in FIG. 1 are shown to be in the buccal segments of the appliance. The seating springs may be used in both the upper and lower archways or just in the upper archway, depending upon the needs for any one case. A seating spring 25 includes a bight portion 26 and opposed arms 27 extending rootward to the plane of the bight or loop portion 26. The arms 27 project convergingly toward each other, and their free ends 27a are preferably ball-shaped in order to eliminate any sharp edges and provide a structure which assists in engaging the teeth when deflecting apart during placement of the appliance. The bight portion or loop 26 is embedded in the portion of the body 10 which exists between the upper and lower archways. The arms 27 extend upwardly through the side walls of an archway intermediate adjacent sockets preferably in the molar area and project "rootward," as seen particularly in FIG. 2, so that the arms and particularly the free ends thereof will engage in the embrasure or interproximal areas of the teeth, as shown in FIG. 4. More particularly, the ball-shaped ends 27a move upwardly over the contact area between the teeth to the gingival side of the contact area and into the embrasure areas between the teeth. It should also be appreciated that the exact shape of the seating springs may vary within the scope of the invention since it is only necessary that the arms having free ends extend from the body of the appliance so that the arms and/or just the free ends thereof engage in the embrasure or interproximal areas of the teeth.

From the foregoing, it can be appreciated that the present invention provides a preformed or ready-made tooth positioning and retaining appliance which includes seating springs to assist in immediate placement and retention of the positioner in the mouth of the patient when the fixed appliances are removed.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention, but it is understood that this application is to be limited only by the scope of the appended claims.

The invention is hereby claimed as follows:

1. A preformed tooth positioning and retaining appliance comprising a molded arch-shaped body of resilient material sized to fit arches of a person of an average predetermined size, said body including upper and lower archways to receive upper and lower arches of a person, a plurality of tooth sockets in said archways arranged in ideal arch relationship and preselected positions and sized to receive teeth of an average predetermined dimension to urge the teeth received thereby into the preselected positions of the sockets, and spring means anchored in at least one of the arches of said body having a pair of arms with free ends projecting toward each other into opposed relation for engagement in the embrasure areas of the teeth of the respective arch to assist in orienting and retaining the appliance in the mouth of the wearer.

2. A preformed tooth positioning and retaining appliance as defined in claim 1, wherein said free ends of the arms are ball-shaped.

3. A preformed tooth positioning and retaining appliance as defined in claim 1, wherein said spring means includes a bight portion anchored in said body substantially between said archways and connected across the arms.

4. A preformed tooth positioning and retaining appliance as defined in claim 3, wherein each of said arms extend rootward relative to the plane of the bight portion.

5. A preformed tooth positioning and retaining appliance comprising a molded arch-shaped body of resilient material, upper and lower archways in the body to receive upper and lower arches of a person, a plurality of tooth sockets in said archways formed to receive typically sized teeth, and spring means anchored in said body having arms projecting into the archways for engagement in the embrasure areas of the teeth to assist in orienting and retaining the appliance in the mouth of the wearer.

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