

Aug. 31, 1965

B. J. PETRAITIS
ORTHODONTIC APPLIANCE

3,203,098

Filed Sept. 19, 1961

2 Sheets-Sheet 1

Fig. 1

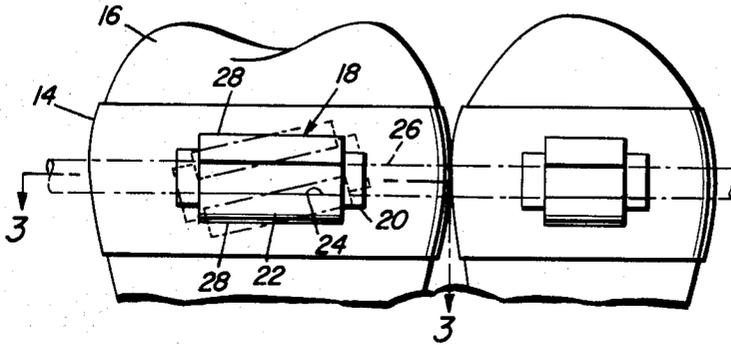


Fig. 2

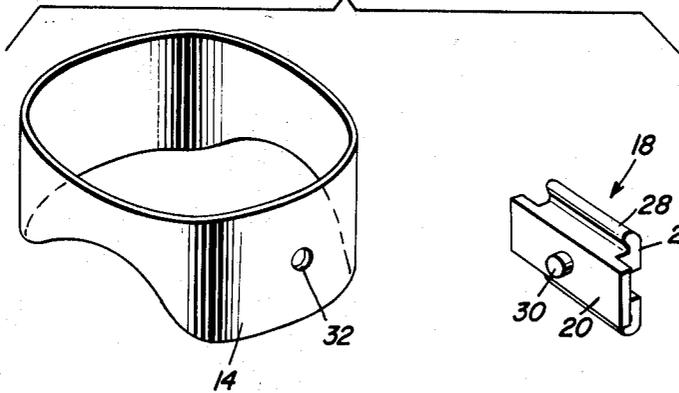
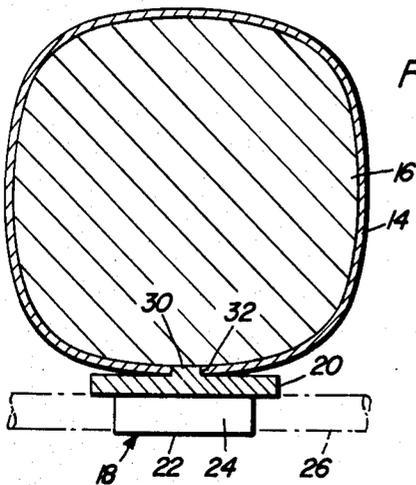


Fig. 3



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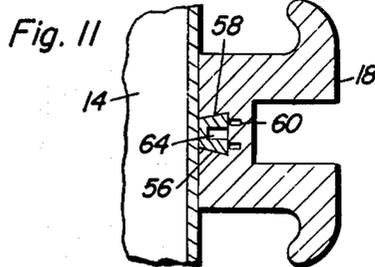
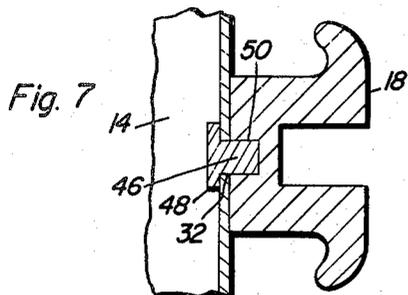
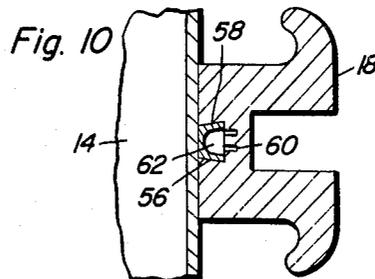
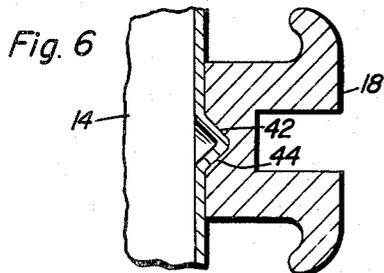
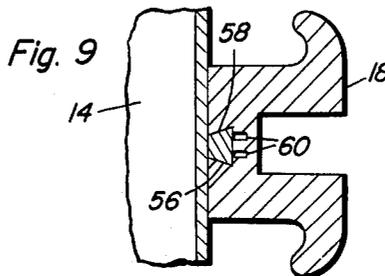
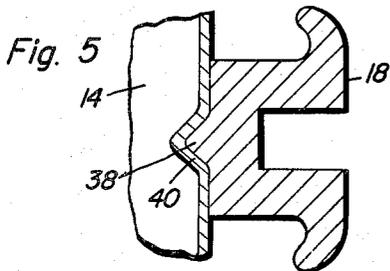
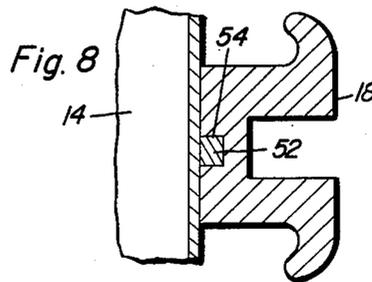
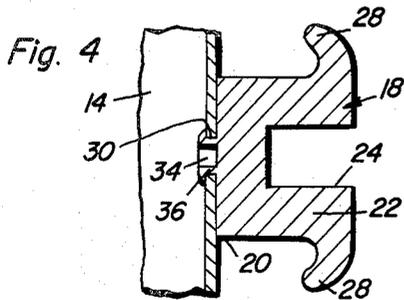
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ORTHODONTIC APPLIANCE

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2 Sheets-Sheet 2



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1

3,203,098

ORTHODONTIC APPLIANCE

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9 Claims. (Cl. 32-14)

This invention relates to new and useful improvements in orthodontic appliances which, in accordance with conventional practice, utilize bands placed upon the teeth and slotted brackets strategically positioned on the bands for engagement by an arch wire. The arch wire is received and tied by ligatures in the slots of the brackets and the positioning of the brackets on the tooth bands is critical in enabling the arch wire to exert proper forces in proper directions on the teeth to be straightened. In conventional procedure a band is made to fit a particular tooth and a point is marked on the band to indicate the location where a bracket is to be secured thereto. In mounting the bracket, it is placed over the marked point on the band and is welded or soldered in place. In this respect a difficulty arises in properly locating the bracket inasmuch as the marked point on the band is hidden by the bracket when the latter is positioned, the result being that the bracket is often secured to the band off the desired marked location and must be removed for repositioning, during which the same difficulty again arises.

Moreover, the orientation of the arch wire receiving slot in the bracket relative to the band cannot be adjusted once the bracket is secured to the band, and if such adjustment is desirable or necessary during fitting of the appliance, the bracket must also be removed from the band and relocated to effect the desired orientation of the slot.

It is, therefore, the principal object of the invention to eliminate the difficulties above outlined and to facilitate easy, convenient and highly accurate locating of the bracket at a predetermined point on the tooth band, and to further facilitate adjustment in orientation of the bracket slot after the bracket is located on the band.

This object is attained by the provision of coating means on the bracket and at a predetermined point on the band for accurately locating the bracket thereon, while permitting angular movement of the bracket about that point for orienting the bracket slot relative to the band as desired.

Some of the advantages of the invention reside in its simplicity, convenient and accurate use, and in its adaptability for embodiment in orthodontic appliances of various sizes and types.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary elevational view showing two teeth equipped with bands and brackets, the arch wire being shown by dotted lines;

FIGURE 2 is a group perspective view of one tooth band and one bracket on an enlarged scale;

FIGURE 3 is an enlarged horizontal sectional view, taken substantially in the plane of the line 3-3 in FIGURE 1; and

FIGURES 4-11 inclusive are fragmentary vertical sectional views showing various modified embodiments of the means for locating the bracket on the tooth band.

Referring now to the accompanying drawings in detail, more particularly to FIGURES 1-3 inclusive, the numeral 14 designates an orthodontic tooth band which has been made to fit a particular tooth 16 and which is firmly cemented to the tooth in accordance with conventional practice when the orthodontic appliance is in-

2

stalled. The bracket is designated generally by the numeral 18 and includes a mounting base 20 and an integral body portion 22 which is formed with a transverse slot 24 to receive the arch wire 26 and is also formed with longitudinal wings 28 for ligature (not shown) used in tying the arch wire in the slot. The end portions of the base 20 project laterally beyond the body portion 22 so that they may be welded or soldered to permanently secure the bracket to the tooth band after the bracket has been initially located and properly oriented on the band, as will be presently described.

The structure thus far described is conventional and the invention resides in the provision of means for accurately locating the bracket 18 at a predetermined point on the band 14 while facilitating angular adjustment of the bracket about that point, so that the bracket slot 24 is oriented as required relative to the band and, consequently, to the tooth.

These means involve the provision of a cylindrical locating pin 30 on the mounting base 20 of the bracket 14, the pin 30 preferably being disposed centrally of both the length and width of the slot 24 and having its axis at right angles to the longitudinal axis of the slot, as shown. After the band 14 has been initially fitted to the tooth, a point is marked on the band to indicate the exact location where the bracket 18 is to be placed on the band, and upon removal of the band from the tooth, a circular recess or aperture 32 is drilled through the band at the marked point as shown in FIGURE 2, the diameter of this aperture being such as to snugly receive the locating pin 30 of the bracket 18. The bracket may then be quickly and easily applied to the band by simply inserting the locating pin 30 in the aperture 32, whereby accurate positioning of the bracket at the predetermined point on the band is effected. The snug fit of the pin in the aperture prevents the bracket from turning freely about the axis of the pin, yet is such that the bracket may be rotated by application of manual force for angular adjustment about the pin axis, so that the bracket slot 24 is oriented as desired in relation to the band 14 and consequently to the tooth. After location and orientation of the bracket on the band has been made, the bracket may be permanently secured to the band by soldering or welding, in the conventional manner.

The invention contemplates various modified embodiments of the locating and adjusting means 30, 32 shown in FIGURES 2 and 3, such modifications being illustrated in FIGURES 4-11 inclusive.

Thus, in the embodiment of FIGURE 4, the locating pin 34 of the bracket 18 is tubular rather than solid so that after being inserted in the band aperture 30, it may be peened over as at 36 to prevent its withdrawal.

In the embodiment of FIGURE 5 the bracket is provided with a conical locating element 38 in place of a pin, the element 38 being received in a complementary, conical recess or depression 40 formed in the band 14.

In the embodiment of FIGURE 6 the arrangement of FIG. 5 is reversed in that the conical locating element 42 is provided on the band 14 which the bracket 18 is formed with the depression 44 to receive the element.

In the embodiment of FIGURE 7 the band aperture 32 receives a rivet 46 having a head 48 at the inside of the band and having its shank pressed into a cylindrical bore or socket 50 formed in the bracket.

In the embodiment of FIGURE 8 a cylindrical pin 52 is suitably secured to the outside of the band 14 and is received in a cylindrical bore or socket 54 in the bracket 18.

In the embodiments of FIGURES 9, 10 and 11 a frusto-conical locating element 56 is suitably secured to the outside of the band 14 while the bracket 18 is provided with a complementary frusto-conical re-

3

cess or socket 58. Although the parts are of metallic construction, the metal is relatively soft and at least slightly resilient, so that when the bracket is applied to the band, the locating element 56 is snap-fitted into the socket 58 to hold the parts assembled. The inner end wall of the socket 58 in the bracket is preferably provided with a plurality of slots 60 to enhance the springingness of the socket, and for the purpose of enhancing the resiliency of the element 56, the same may be made hollow as indicated at 62 in FIGURE 10, or formed with a slot as indicated at 64 in FIGURE 11.

It is to be noted that in all of the embodiments of FIGURES 4-11, as in the embodiment of FIGURES 1 to 3, the locating element is rotatable by manual force in its aperture, recess or socket, as the case may be, to facilitate adjustment of orientation of the slot in the bracket relative to the band.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous other modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation as shown and described, and all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is:

1. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface of said band opposed in close proximity to said peripheral surface and positioned on said band and having an arch wire receiving slot, and coating means provided on said band and on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said slot relative to the band, said means being provided in part on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined to a position inwardly of the lengthwise and transverse marginal edges of said bracket, said means comprising a locating element provided on said band at said predetermined point, said bracket being provided with a recess, said locating element being snap-fittingly received in said recess.

2. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface of said band opposed in close proximity to said peripheral surface and positioned on said band and having an arch wire receiving slot, and coating means provided on said band and on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said slot relative to the band, said means being provided in part on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined to a position inwardly of the lengthwise and transverse marginal edges of said bracket, said means embodying a cylindrical locating pin fixedly mounted on said bracket, said pin having a smooth peripheral surface, said band being provided with a circular aperture rotatably receiving said pin.

3. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface on said band and opposed in close proximity to said peripheral surface, positioned on said band and having an arch wire receiving slot, and coating means provided on said band and also on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said arch wire receiving slot relative to said band, said means being provided in part

4

on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined to a position inwardly of the lengthwise and transverse marginal edges of said bracket, said means comprising a cylindrical locating pin having a smooth peripheral surface, said bracket being provided with a cylindrical socket rotatably receiving said pin.

4. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface on said band opposed in close proximity to said peripheral surface and positioned on said band and having an arch wire receiving slot, and coating means provided on said band and on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said slot relative to the band, said means being provided in part on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined to a position inwardly of the lengthwise transverse marginal edges of said bracket, said means comprising a conical locating element provided on said bracket, said band being formed with a conical depression rotatably receiving said element.

5. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface on said band opposed in close proximity to said peripheral surface and positioned on said band and having an arch wire receiving slot, and coating means provided on said band and on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said slot relative to the band, said means being provided in part on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined in a position inwardly of the lengthwise transverse marginal edges of said bracket, said means comprising a conical locating element provided on said band, said bracket being formed with a conical depression rotatably receiving said element.

6. In an orthodontic appliance, the combination of a tooth band, a bracket having an inwardly disposed planar surface proximal with the outer peripheral surface and positioned on said band and having an arch wire receiving slot, and coating means provided on said band and on said bracket for locating the bracket at a predetermined point on the band while permitting angular movement of the bracket about said point for adjustment of orientation of said slot relative to the band, said means being provided in part on said band and in part on said planar surface and being located at the intended centralized attaching point of the bracket to the band and being confined to a position inwardly of the lengthwise and transverse marginal edges of said bracket, said means comprising a frusto-conical locating element provided on said band, said bracket being provided with a frusto-conical socket snap-fittingly receiving said element.

7. In an orthodontic appliance, in combination, a tooth-embracing band designed and adapted to securely embrace a given tooth, said band being provided at a predetermined place with bracket-accommodating, locating means, a complementary bracket having an outer surface provided with means for the attachment thereto of an arch wire, said bracket being further provided with a planar surface opposed to a cooperating surface on said band, said planar surface being provided at a bracket orienting point with quick separable centering and orienting means, the latter registering with and connectible with the first-named means, said means, conjointly considered, permitting said bracket to be bodily rotated about its center so that the arch wire accommodating means can be

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given its intended and proper inclination in respect to the root of the tooth and band as a step preparatory to finally fixing the bracket in its intended position on said band, said first-named means comprising a pin fixed to and projecting beyond an outer peripheral surface of said band at a pre-

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determined carefully marked spot on said band, said pin having a smooth peripheral surface, and said second-named means comprising a recess formed in the inner surface of said bracket, said recess constituting a socket for snug-fitting telescopic reception and retention of said pin.

8. In an orthodontic appliance, in combination, a tooth-embracing band designed and adapted to securely embrace a given tooth, said band being provided at a predetermined place with bracket-accommodating, locating means, a complementary bracket having an outer surface provided with means for the attachment thereto of an arch wire, said bracket being further provided with a planar surface opposed to a cooperating surface on said band, said planar surface being provided at a bracket orienting point with quick separable centering and orienting means, the latter registering with and connectible with the first-named means, said means, conjointly considered, permitting said bracket to be bodily rotated about its center so that the arch wire accommodating means can be given its intended and proper inclination in respect to the root of the tooth and band as a step preparatory to finally fixing the bracket in its intended position on said band, said first-named means comprising a pin fixed to and projecting beyond an outer peripheral surface of said band at a predetermined carefully marked spot on said band, and said second-named means comprising a recess formed in the inner surface of said bracket, said recess constituting a socket for snug-fitting telescopic reception and retention of said pin, said pin being conical in form and said socket having a corresponding conical shape and size conformable with said pin.

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9. In an orthodontic appliance, in combination, a tooth-embracing band designed and adapted to securely embrace a given tooth, said band being provided at a predetermined

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place with bracket-accommodating, locating means, a complementary bracket having an outer surface provided with means for the attachment thereto of an arch wire, said bracket being further provided with a planar surface opposed to a cooperating surface on said band, said planar surface being provided at a bracket orienting point with quick separable centering and orienting means, the latter registering with and connectible with the first-named means, said means, conjointly considered, permitting said bracket to be bodily rotated about its center so that the arch wire accommodating means can be given its intended and proper inclination in respect to the root of the tooth and band as a step preparatory to finally fixing the bracket in its intended position on said band, said first-named means comprising a pin fixed to and projecting beyond an outer peripheral surface of said band at a predetermined carefully marked spot on said band, and said second-named means comprising a recess formed in the inner surface of said bracket, said recess constituting a socket for snug-fitting telescopic reception and retention of said pin, said pin being conical in form and said socket having a corresponding conical shape and size conformable with said pin, said means, conjointly considered, having slot means embodied therein to provide resiliency and to permit snap-fitting of the pin into the socket and to assist in retaining the bracket in a temporarily usable set position until respective end portions of the bracket can be permanently welded and joined with said band.

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