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Polak

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[54] **CONVERTIBLE BUCCAL TUBE OR BRACKET**

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[52] **U.S. Cl.** ..... **32/14 A**

[51] **Int. Cl.** **A61c 7/00**

[58] **Field of Search** ..... 32/14 A

[56] **References Cited**

UNITED STATES PATENTS

3,391,461 7/1968 Johnson ..... 32/14 A

Primary Examiner—Robert Peshock

Attorney, Agent, or Firm—Jessup & Beecher

[57] **ABSTRACT**

An orthodontic convertible buccal tube or bracket, with spaced-apart and arch-slotted mesial and distal lugs, has a guide channel and closed arch slots developed by a channel tab member selectively fastened to the mesial and distal lugs so that an arch wire is easily threaded therethrough.

11 Claims, 4 Drawing Figures

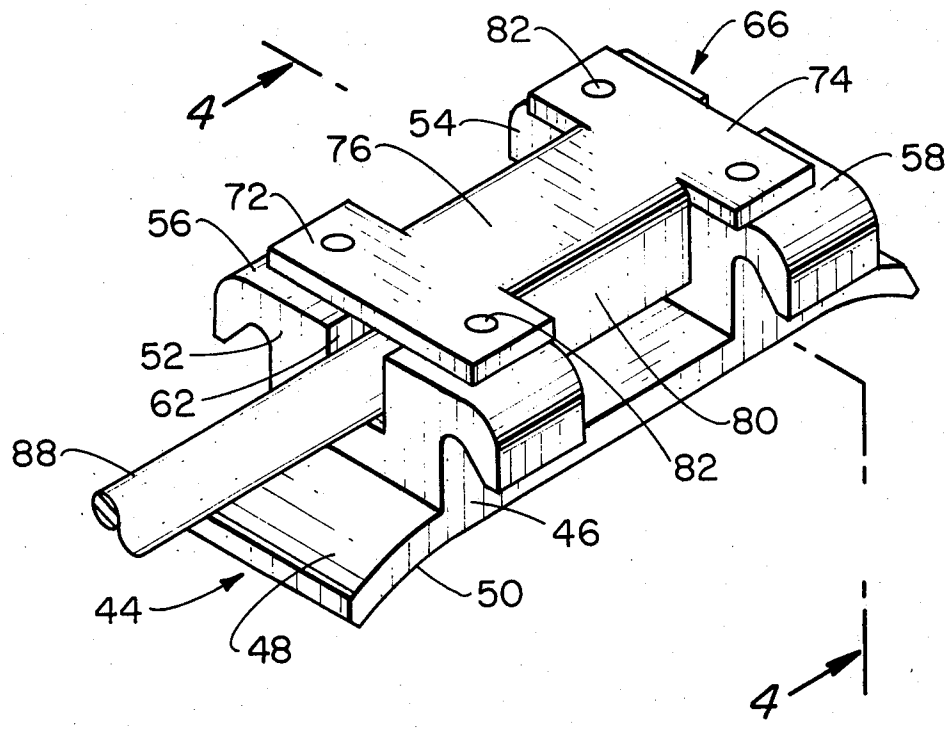


Fig. 1.
PRIOR ART

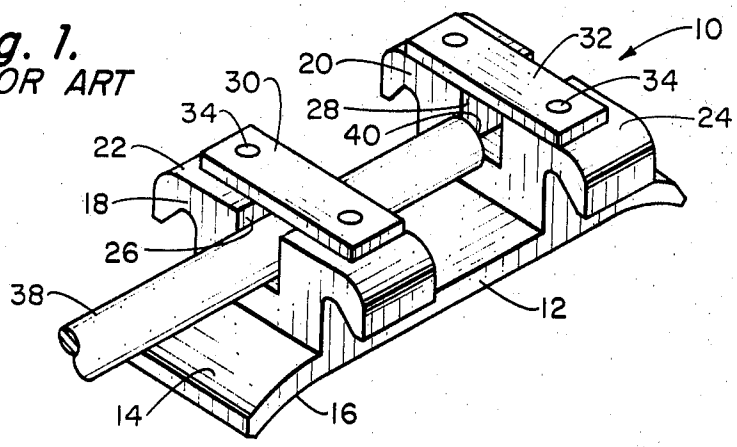


Fig. 2.

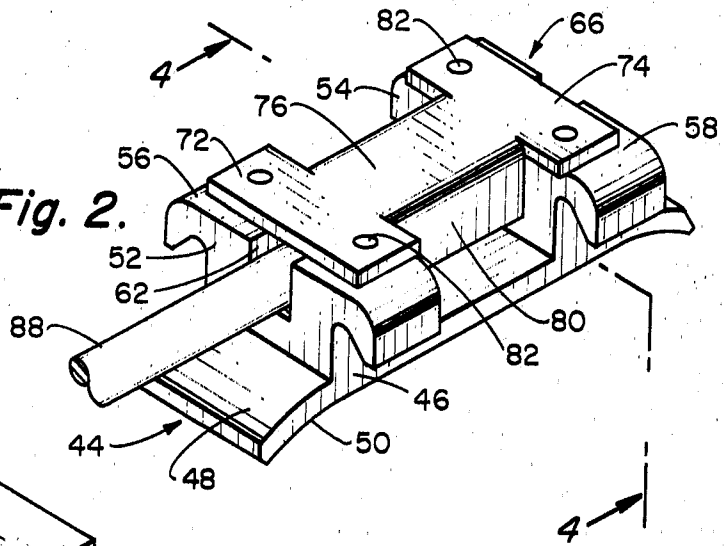


Fig. 3.

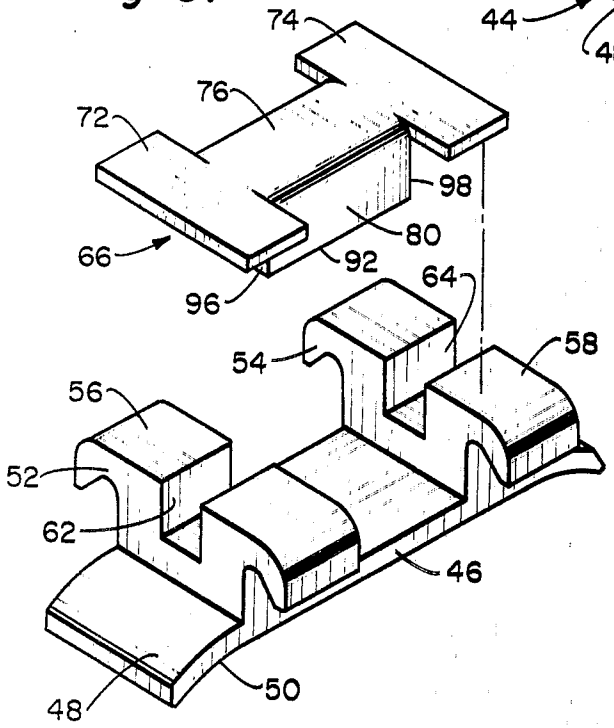
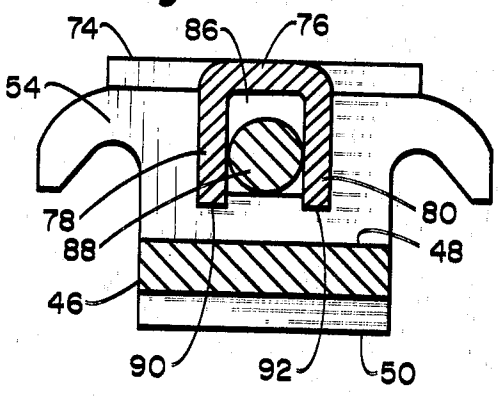


Fig. 4.



CONVERTIBLE BUCCAL TUBE OR BRACKET

BACKGROUND OF THE INVENTION

Orthodontics, as a branch of dentistry dealing with irregularities of the teeth and their correction, uses the application of predetermined and directed corrective mechanical forces to reposition irregular teeth to their proper position. The corrective forces can be developed by various orthodontic apparatus, such as orthodontic brackets in combination with a tensioned or torqued arch wire. Conventional orthodontic brackets have an arch slot that receives the arch wire, while convertible buccal tubes or brackets have a closed arch slot that forms a buccal tube which is convertible to a conventional bracket with an open arch slot; for example, see U.S. Pat. No. 3,391,461. A closed arch slot or buccal tube not only retains the arch wire, but also permits unrestricted mesial and distal, i.e. longitudinal, movement of the arch wire without binding of the arch wire within the buccal tube.

Convertible buccal tubes or brackets are used primarily on first molars: first as a buccal tube and then as a conventional bracket so that the same tooth is not banded twice with a separate buccal tube and a separate orthodontic bracket, but rather is banded only once which results in a saving of time and reduces patient discomfort.

While U.S. Pat. No. 3,391,461 describes one method of forming a closed arch slot on a single-lug orthodontic bracket, other methods of forming a closed arch slot are by welding a bar, wire, or the like, across the open arch slot. However, these methods of forming a closed arch slot when used on certain orthodontic brackets, such as a bracket with a twin-lug configuration (see U.S. Pat. No. 3,530,583), leave an open space between the spaced-apart twin lugs. This open space creates a problem for an orthodontist who must thread an arch wire through the closed arch slots of the twin lugs. When the arch wire is inserted into the closed arch slot of the mesial or front lug, it exits from the slot into the open space between the mesial and the distal or rear lug. Since the distal or free end of the arch wire is no longer retained and is free to move in any direction, threading the arch wire into the closed arch slot of the distal lug becomes extremely difficult. This problem is multiplied in many orthodontic situations by the tipped or rotated conditions or the teeth that can cause the distal end of the arch wire to be directed at odd angles and orientations in the open space between the mesial and distal lugs.

OBJECTS OF THE INVENTION

Accordingly, it is an object of the invention to provide a new and improved convertible buccal tube or bracket.

It is an object of the invention to provide a convertible buccal tube or bracket having an improved arch wire guide channel.

It is an object of the invention to provide an improved convertible buccal tube or bracket having a selectively removable arch wire guide.

It is an object of the invention to provide a convertible buccal tube or bracket having an improved channel tab developing an arch wire guide channel.

It is an object of the invention to provide an improved convertible buccal tube or bracket having an improved arch wire guide channel that facilitates dental hygiene.

SUMMARY OF THE INVENTION

Briefly, in accordance with the invention, an improved convertible buccal tube or bracket is provided having spaced-apart first and second lugs with respective first and second arch slots. A channel tab has end portions that are fastened to the arch slots to selectively close the arch slots. A central body portion of the channel tab has first and second side portions spaced apart by the body portion and extending between the end portions. The side portions depend between the first and second lugs and with the central body portion develop a guide channel between the lugs and each arch slot so taht a buccal tube or full channel, which may be selectively converted to a bracket, both guides and retains an arch wire therethrough and therein.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which may be regarded as the invention, the organization and method of operation, together with further objects, features, and the attending advantages thereof, may best be understood when the following description is read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of one form of prior art orthodontic bracket;

FIG. **2** is a perspective view of the improved convertible buccal tube or bracket of the invention;

FIG. **3** is an exploded perspective view of the improved convertible buccal tube or bracket of the invention; and

FIG. **4** is a sectional view of the improved convertible buccal tube or bracket of FIG. **2** along the line **4-4.**

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring to FIG. **1,** a prior art form of orthodontic bracket **10** has a longitudinally extending base **12** with a front or buccal surface **14** and a rear or lingual surface **16** adapted to be fastened to a tooth band (not shown). A mesial lug **18** and a distal lug **20** extend outwardly from buccal surface **14** and terminate in tie-wing buccal surfaces **22** and **24,** respectively. Arch slots **26** and **28** in the spaced-apart mesial and distal lugs **18** and **20,** respectively, are closed by respective bars **30** and **32** that are fastened, for example, by similar spot welds **34** to the tie-wing buccal surfaces. An arch wire **38** extends through the closed mesial arch slot **26** with the free or distal end **40** of the arch wire positioned to enter closed distal arch slot **28.** Since the distal end **40** of the arch wire **38** is free and unrestrained, the "threading" of the arch wire into the distal arch slot **28** becomes extremely difficult.

Referring to FIGS. **2** and **3,** the improved orthodontic convertible buccal tube or bracket **44** of the invention has a longitudinally extending base **46** with a front or buccal surface **48** and a rear or lingual surface **50.** A mesial lug **52** and a distal lug **54** extend outwardly from buccal surface **48** and terminate in respective tie-wing buccal surfaces **56** and **58.** The spaced-apart mesial and distal lugs **52** and **54** have respective arch slots **62** and **64** that are selectively closed by a channel tab **66** as described hereinafter. While the arch slots **62** and **64**

can be longitudinally aligned as illustrated, it is contemplated that the arch slots can also be selectively non-aligned as may be required.

Channel tab **66** as illustrated by FIGS. **2, 3** and **4** is a generally planar member having end portions **72** and **74** continuous with and generally transversely extending from a longitudinally extending central body portion **76.** The central body portion **76** has side portions **78** and **80** spaced-apart thereby and extending outwardly therefrom in a substantially parallel relationship. It is contemplated that the central tab can be other than planar and that the side portions can be other than parallel, and that the side portions can be separate from, but fastened to, the central body portion as may be required. The end portions **72** and **74** of channel tab **66** are positioned on the tie-wing buccal surfaces **56** and **58** of the respective mesial and distal lugs **52** and **54,** and fastened, for example, by similar spot welds **82.** The end portions **72** and **74** support and stabilize the channel tab **66** and position the central body portion **76** with its outwardly extending side portions **78** and **80** depending between the mesial and distal lugs.

The central body portion **76** and the side portions **78** and **80** with the buccal surface **48** develop a longitudinally extending guide channel or buccal tube **86** that leads from closed mesial arch slot **62** to closed distal arch slot **64.** The buccal tube **86** guides the distal end of arch wire **88** from the mesial arch slot to the distal arch slot, and permits desired mesial-distal movement of the thus retained arch wire within the buccal tube.

The side portions **72** and **74** of channel tab **66** as shown by FIGS. **2, 3** and **4** have respective edges **90** and **92** that are maintained adjacent to and spaced from buccal surface **48,** particularly as shown by FIG. **4.** Similar mesial edges **96** and similar distal edges **98** of the respective side portions **72** and **74** are also maintained adjacent to and spaced from their associated mesial and distal lugs **52** and **54.** The resulting spaced relationship between the side portions, the buccal surface, and the lugs facilitates removal of any foreign matter that may collect in the buccal tube **86,** for example, by flushing out the foreign matter with a pressurized fluid stream.

In the convertible buccal tube or bracket **44** of the invention, removal of the central tab **66** can be easily accomplished by cutting or breaking and grinding so that the buccal tube **86** is converted to a bracket with open arch slots, for example, when the second molars are banded.

What is claimed is:

1. In combination:

a twin orthodontic bracket having a pair of spaced lugs, said lugs having respective aligned slots for the reception of an arch wire: and

channel means aligned with said slots and developing a longitudinally extending guide channel and having end means extending outwardly therefrom and fastened to said bracket.

2. The combination of claim **1** in which said channel means includes a body portion, and first and second side portions spaced apart by and extending outwardly from said body portion, and said end means includes first and second end portions extending transversely to said body portion.

3. The combination of claim **2** in which said body portion is generally planar and said first and second end portions are coextensively planar with said body portion.

4. In combination:

a twin orthodontic bracket having a pair of spaced lugs, said lugs having respective aligned slots for the reception of an arch wire;

a channel tab extending between said lugs and aligned with said slot and comprising:

a. a generally planar member having first and second end portions spaced apart by a central body portion; and

b. first and second side portions extending from said central body portion and spaced apart by said body portion, said first and second side portions and said central body portion developing a longitudinally extending guide channel.

5. The combination of claim **4** in which said first and second end portions are coextensively planar with said central body portion.

6. The combination of claim **5** in which said first and second side portions are substantially parallel.

7. A convertible buccal tube or bracket comprising:

a. a longitudinally extending base portion having a lingual surface and a buccal surface;

b. first and second spaced-apart lug portions extending outwardly from said buccal surface and terminating in respective first and second tie-wing buccal surfaces;

c. first and second longitudinally extending arch slots in respective ones of said first and second lug portions; and

d. a channel tab including:

1. first and second end portions spaced apart by a central body portion,

2. said first and second end portions removably fastened to respective ones of said first and second tie-wing buccal surfaces to position and stabilize said channel tab, and

3. first and second side portions depending from said central body portion between said lug portions, said first and second side portions spaced apart by said body portion,

4. said first and second side portions and said body portion developing a longitudinally extending guide channel between said lug portions and said first and second arch slots so that a buccal tube is developed which is convertible to a bracket.

8. The convertible buccal tube or bracket of claim **7** in which said first arch slot is longitudinally aligned with said second arch slot.

9. The convertible buccal tube or bracket of claim **7** in which said channel tab is generally planar.

10. The convertible buccal tube or bracket of claim **7** in which said depending first and second side portions have edges adjacent to and spaced from said buccal surface and said lug portions.

11. In an orthodontic bracket wherein a longitudinally extending base portion has a buccal surface and first and second spaced-apart lugs extending outwardly therefrom and terminating in respective first and second tie-wing buccal surfaces and having respective first and second arch slots, the combination thereof with said bracket of a channel tab comprising:

a. first and second end portions spaced apart by a central body portion;

b. said first and second end portions removably fastened to respective ones of said first and second tie-wing buccal surfaces to position and stabilize said channel tab; and

c. first and second side portions depending from said central body portion between said lugs, said first and second side portions spaced apart by said body portion,

d. said first and second side portions and said body portion developing a guide channel between said lugs that is in alignment with said first and second end portion closed arch slots so that a buccal tube is developed which is convertible to a bracket.

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