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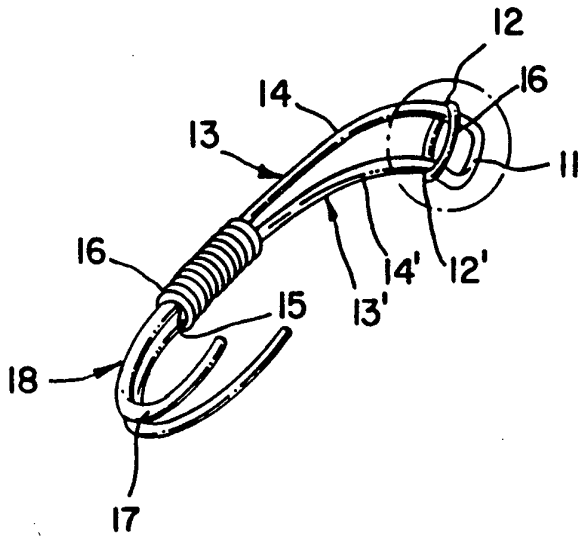

(57) Abstract

Instead of preparing the elastic rings and tool separately for the treatment, the tool of this invention can hold a number of elastic rings behind the head. When needed, an elastic ring can be pushed to the head of the tool and fixed by the indented portion of the head. Then, the elastic ring can be fastened to the bracket by the same procedure as with the traditional tools. Also, it provides a simpler way to fix the position of the elastic ring at the head of the tool. Thus, it prevents unnecessary waste of the elastic rings during the elastic ring placement at the head. The tool is designed to be disposable so that it can eliminate hygienic problem which may be caused by the repeated use of the traditional plier-type tools.

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TOOL FOR FASTENING THE RINGS TO THE BRACKET IN ORTHODONTIA APPLICATIONS AND METHOD THEREFOR

BACKGROUND OF THE INVENTION

This design relates to a tool for fastening the elastic rings to the brackets holding an archwire in between for the orthodontic treatment. Without additional equipment or tools, the elastic ring can be fastened to the bracket easily by the tool to be described.

Prior art apparatus and methods for the orthodontic treatment can be explained by reference to FIGS. 1, 5 and 6. First, the back plate (3) of a H-shaped bracket (1) having a groove (2) is attached to the center of the tooth for the treatment. An archwire (5) is then inserted to the grooves (2) of the brackets (1) which have been attached to two teeth (4)(4'). The elastic ring is fastened to the upper and lower part (1)(1') of the H-shaped bracket (1) to fix the archwire (5). Then, the both ends of the archwire (5) are bent to achieve the desired position of the teeth (4)(4').

One of the traditional methods for fastening the elastic rings to the bracket can be explained by the FIG. 5. The elastic rings (6) are kept at the body of holder (7). Then, the elastic rings are separated one by one using a plier-type tool (not shown in the FIG. 5) and fastened to the upper and lower part (1')(1") of the bracket (1). The other method is shown in FIGS. 6(a) and (b). In this method, a number of elastic rings (6) are kept at the wire holder (8) as in FIG. 6(a). Each elastic ring is separated from the wire holder using a tool (10) having a U-shaped curvature (9). The tool is shown in FIG. 6(b). (The procedure for fastening with this tool is the same as with the tool of invention and will be described in details later).

In the method of FIG. 5, a plier-type tool is put into the ring and opened so that the expanded ring can be fastened to the upper and lower part (1')(1") of the bracket (1). Therefore, the plier-type tool needs to be positioned perpendicular to the teeth (4)(4'). Thus, in case of a molar tooth, the mouth of a patient is forced to be opened wide to the side.

Furthermore, in the method of FIG. 6(a) and (b), the procedure to separate an elastic ring (6) from the wire holder and to place at the bent portion (9) of the tool (10) is not trivial. Due to the elasticity of the ring (6), a number of elastic rings are often wasted during this procedure.

SUMMARY OF THE INVENTION

However, a tool to be described will eliminate the need of a holder because the elastic rings are kept at the rear end of the tool. When needed, an elastic ring can be pushed towards the head of the tool and placed easily at the indented portion of the head.

This tool also prevents undesired waste of the rings as in the method of FIG. 6.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the invention. In such drawings:

FIG. 1 shows bracket attached to teeth;

FIG. 2 shows a tool for fastening of this application;

FIG. 3 shows an alternative design of a tool;

FIG. 4 shows the procedure for fastening;

FIG. 5 shows one of the conventional holders to hold the elastic rings;

FIG. 6(a) shows another conventional holder to hold the elastic rings; and

FIG. 6(b) shows a conventional tool for fastening the elastic rings for the holder in FIG. 6(a).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the tool and procedure for fastening an elastic ring to the bracket will be described in details by the FIGS. 2, 3, and 4.

The center of wire is bent to form a U-shaped head (11) of a tool. The indented portion (12)(12') of the head is also made for the placement of the elastic ring at the head. The side bars (13)(13') are made to form the slanted portion (14)(14') of the tool. A number of elastic rings (16) are held where two wires are met together (15). The end (17) of side bars (13)(13') are bent to keep the elastic rings. Thus, a tool for fastening the elastic ring to the bracket is achieved. During the treatment, an elastic ring (16) is gradually expanded as moving towards the slanted portion (14)(14') of the head of a tool. When reached at the indented portion (12)(12') of the head (11), it is slightly shrunk and fixed at that position (12)(12').

After an elastic ring is placed at the indented portion of the head, the inner portion of the elastic ring (16) is inserted to the upper part (1') of the bracket (1) as shown in FIG. 4(a). The ring (16) is then expanded by rotating the tool (18) by 90 degrees as in FIG. 4(b).

When rotated 180 degrees as in FIG. 4(c), the elastic ring (16) is separated from the tool (18) and then inserted into the lower part (1") of the bracket (1) as in FIG. 4(d). Finally, the elastic ring (16) fixes the position of the archwire (5) inserted to the grooves (2).

Alternative design of a tool is shown in FIG. 3. Instead of the indented portion (12) of the head, the concave portion (20) is formed at the head of the tool. With this alternative design, it is not necessary to fix the position of the elastic ring (16) at the head (11) of the tool (18).

I claim:

1. A tool for fastening an elastic ring to the bracket for orthodontic treatment, the tool comprising;

(a) U-shaped head (11) of a tool made by bending a center of a wire,

(b) indented portion (12)(12') at the head to fix the position of the ring,

(c) side bars (13)(13') gradually narrowing down to form the slanted portion (14)(14'),

(d) the portion of two wires meeting together (15) to hold a number of rings (16), and

(e) the ends (17) of two wires (13)(13') bent to keep the rings inside the tool.

2. The tool according to claim 1, wherein concave portion (20) at the head (11) of the tool instead of the indented portion.

3. A method for attaching an elastic resilient holding ring to upper and lower pairs of projecting parts of an H-shaped orthodontic bracket positioned on opposite sides of a archwire slot therethrough, the bracket being secured to a tooth and the archwire slot being used to receive an archwire, the method using a tool which has a relatively narrow handle portion around which a plurality of the elastic rings are stored in an unstretched condition and a relatively wider, notched end portion across which each elastic ring may be stretched to extend widely enough to fit over the pair of the projecting parts of the bracket on one side of the archwire groove, the method comprising the steps of,

moving one of the elastic rings from the narrow portion of the tool to the notched wider portion to stretch the elastic ring to an elongated condition to fit over the pair of projecting parts of the H-shaped bracket on the one side of the archwire slot;

manipulating the tool to place the stretched elastic ring over the projecting parts of the H-shaped bracket on one side of the archwire slot and placing a free extremity of the wide end of the tool in contact with the surface of the tooth on the opposite side of the archwire slot;

rotating the tool using the contact of its wide end with the tooth as a fulcrum to further stretch the elastic ring until it overlaps and is stretched beyond the pair of projections of the H-shaped bracket on the opposite side of the archwire slot in alignment to engage them; and

extracting the wide end of the tool from the ring to leave the elastic ring secured on both pairs of projecting parts of the H-shaped bracket holding the archwire within the archwire slot.

FIG. 1.

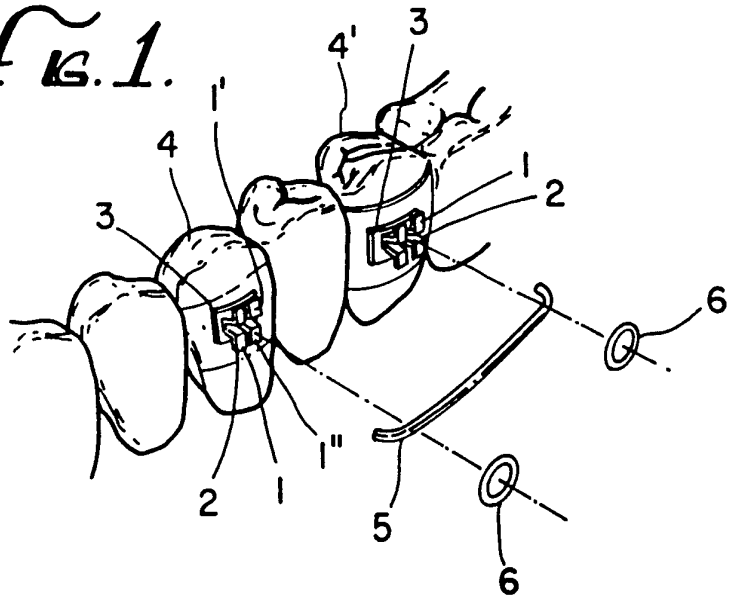


FIG. 3.

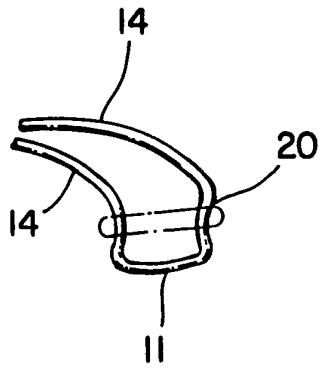


FIG. 2.

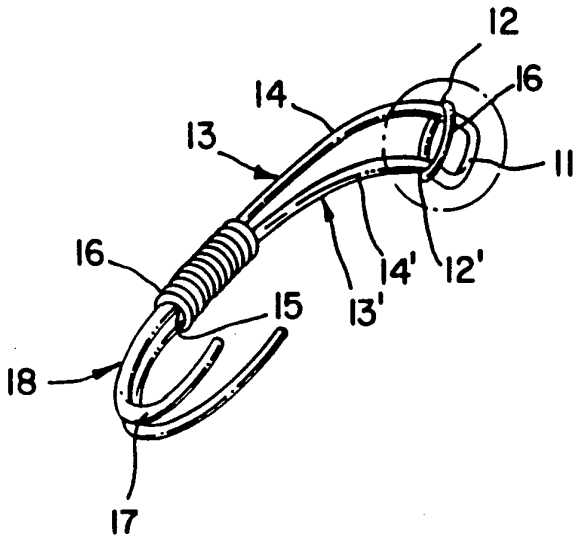
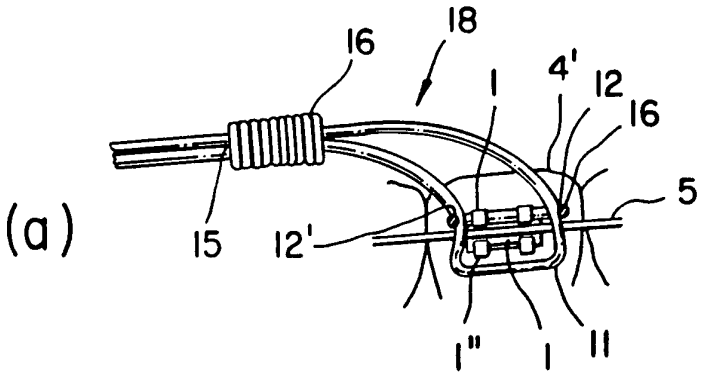
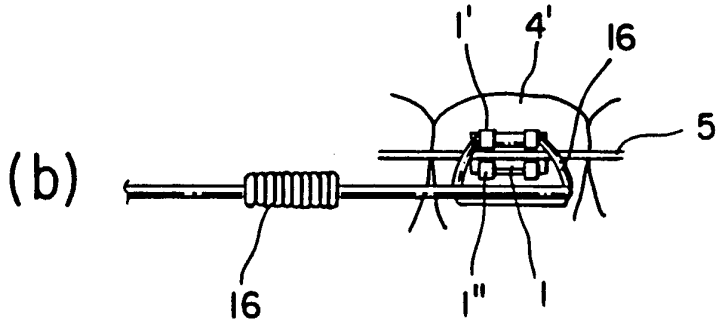
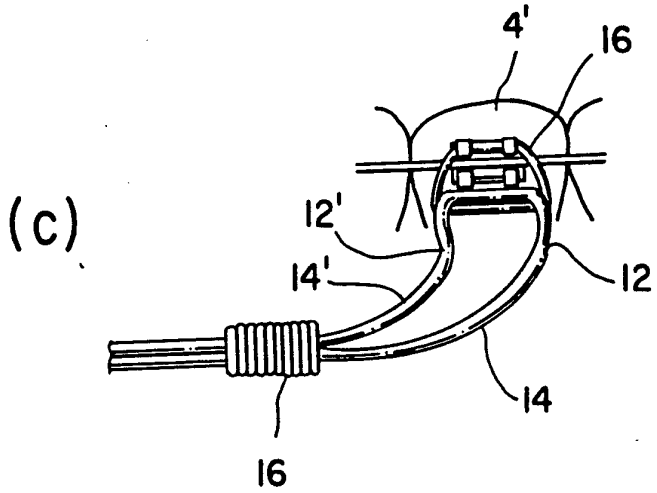


FIG. 4.







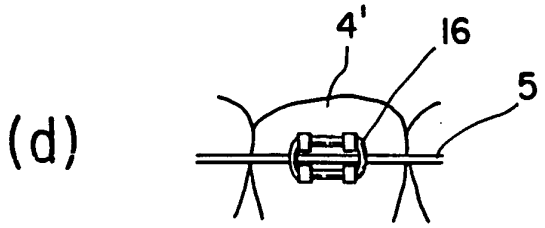


FIG. 5

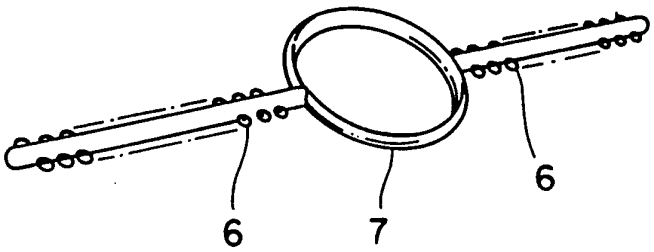
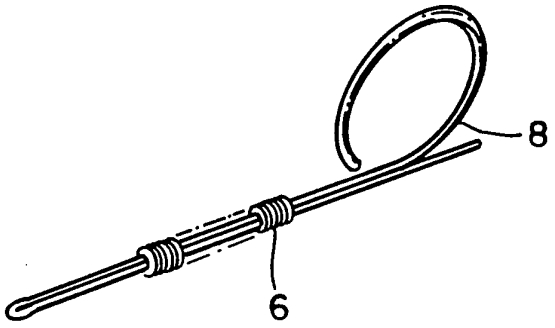
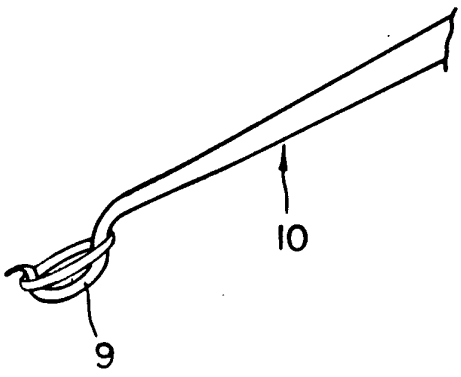


FIG. 6.

(a)



(b)



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 93/06787

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: A61C 7/02
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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: A61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4277236 (CRAVEN H. KURZ), 7 July 1981 (07.07.81), figures 4A and 4B, abstract	1-3
A	US, A, 4038753 (PAUL E. KLEIN), 2 August 1977 (02.08.77)	1-3
A	US, A, 4127940 (DOUGLAS J. SHILLIDAY), 5 December 1978 (05.12.78)	1-3
A	US, A, 4436510 (PAUL E. KLEIN), 13 March 1984 (13.03.84)	1-3

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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US-A- 4038753	02/08/77	US-A- 3903602	09/09/75
US-A- 4127940	05/12/78	NONE	
US-A- 4436510	13/03/84	NONE	
US-A- 4472137	18/09/84	NONE	