June 1, 1971 W. A. SNEAD 3,581,400

DISTAL END CUTTER

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Fig. 1

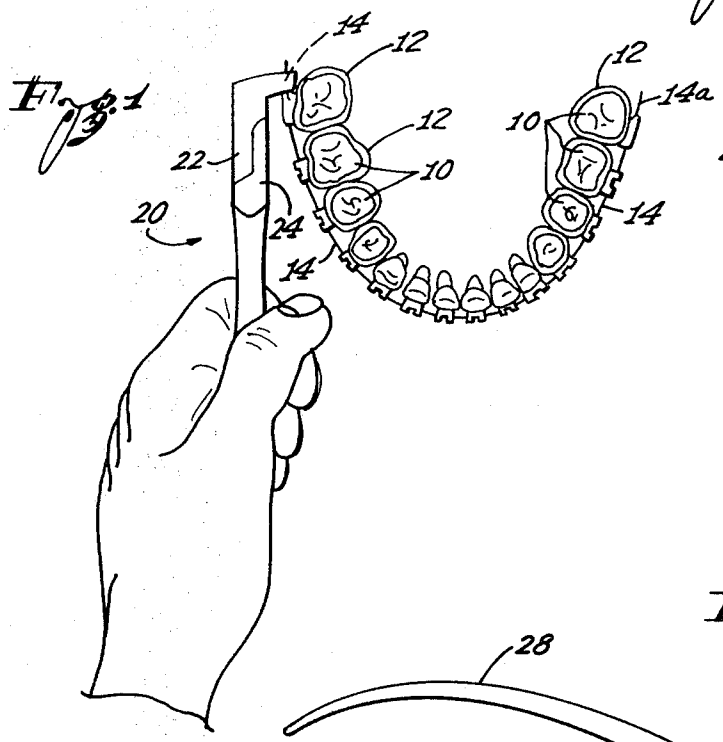


Fig. 2

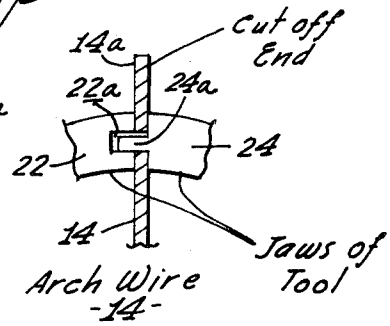


Fig. 3

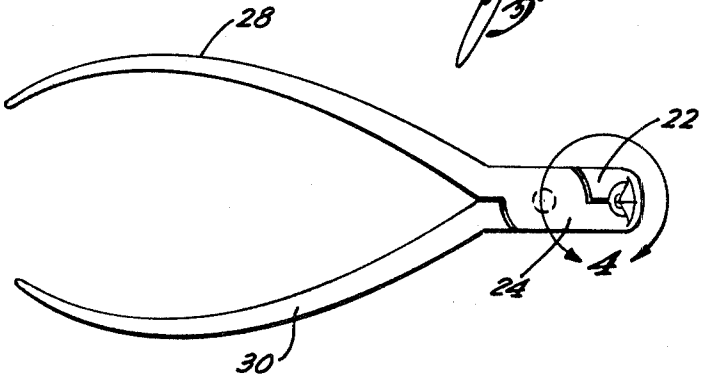
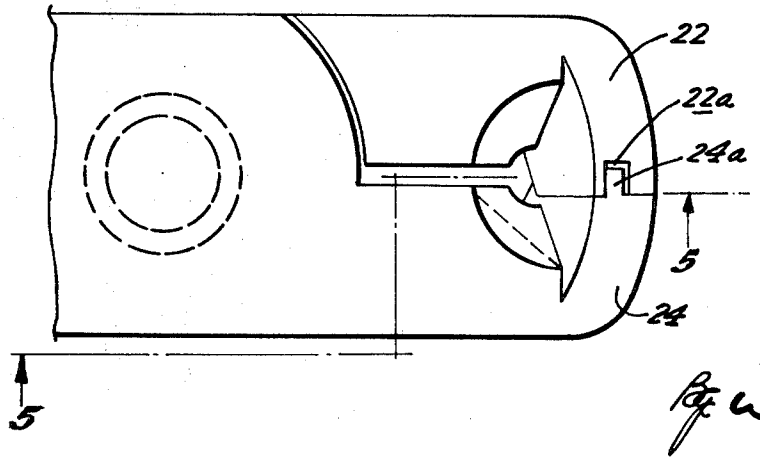


Fig. 4



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Fig. 5

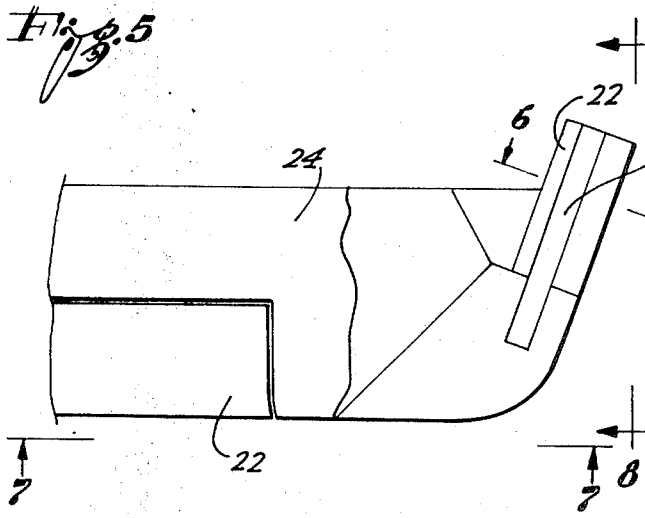


Fig. 6A

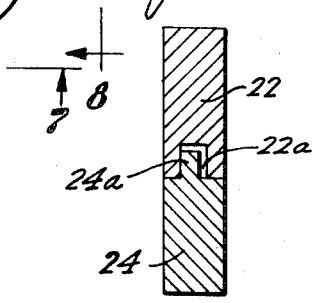


Fig. 6B

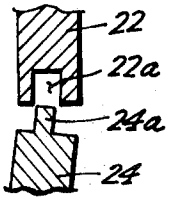


Fig. 7

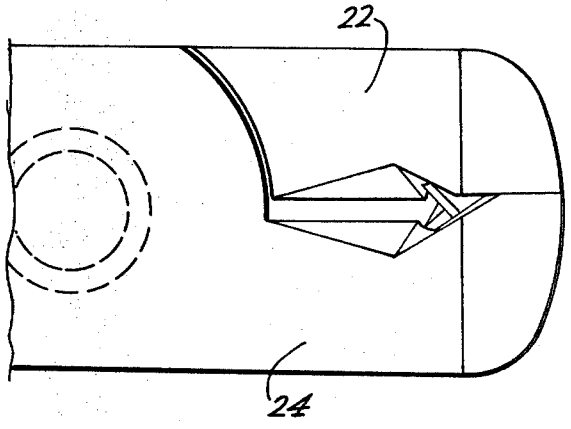
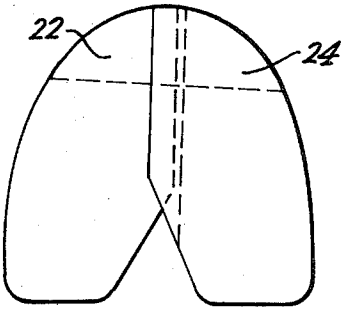


Fig. 8



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3,581,400

DISTAL END CUTTER

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Int. Cl. A61c 7/00
U.S. Cl. 32—66 4 Claims

ABSTRACT OF THE DISCLOSURE

An improved orthodontic pincer-type tool is provided for cutting the end from an arch wire within the mouth of the patient distally of the buccal tube. The tool is constructed so as to be easily manipulated to cut the distal ends off the arch wire, without any tendency for the cut-off ends to be projected forcibly into the gum or cheek tissue of the patient.

BACKGROUND OF THE INVENTION

Orthodontic procedures often include the intercoupling of the bands around the individual teeth of the patient by an arch wire. It is usually necessary to cut off the distal ends of the arch wire after it has been mounted in the mouth of the patient, so that the arch wire ends will not pierce the gums or cheeks of the patient.

However, the cutting of the distal ends of the arch wires has created problems in that a suitable tool must be provided, not only to cut off the distal ends of the arch wire without excessively awkward manipulations, but one which will not have a tendency to "shoot" the cut-off distal ends of the arch wire into the gum or cheek tissue of the patient.

SUMMARY OF THE INVENTION

A pincer-like tool is provided for cutting off the distal ends of an arch wire within the mouth of the patient, the jaws of the tool defining a mating tongue and channel combination which serves to cut off the ends of the arch wires, and which also serve to clamp the cut-off ends securely so as to prevent their being projected forcibly into the adjacent tissue of the patient.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of the teeth of a patient intercoupled by an arch wire, and showing the manner in which the distal end of the arch wire may be cut off by a pincer-like distal end cutter tool constructed in accordance with the concepts of the invention;

FIG. 2 is an enlarged fragmentary schematic representation showing the manner in which the jaws of the pincer-like tool clamp the cut-off end of the arch wire after it has been cut;

FIG. 3 is a plan view of an orthodontic pincer-like distal end cutter tool constructed in accordance with the concepts of the invention;

FIG. 4 is an enlarged plan fragmentary representation of the jaw portion of the tool of FIG. 3;

FIG. 5 is a side view of the jaw section of FIG. 4, taken along the line 5—5 of FIG. 4;

FIGS. 6A and 6B are cross-sectional representations of the jaw section taken along the line 6—6 of FIG. 5, and with the jaws in two different positions;

FIG. 7 is a bottom view of the jaw section of FIG. 5 taken along the line 7—7 of FIG. 5; and

FIG. 8 is an end view of the jaw section of FIG. 5 taken along the line 8—8 of FIG. 8.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

As shown in FIG. 1, the teeth **10** of a patient may be surrounded by individual bands **12**, and all the bands may be coupled together by means, for example, of an arch wire **14**, all in accordance with standard procedures. The arch wire **14** normally has distal ends **14***a* which extend beyond the buccal tube in the distal direction. It is desirable that the ends **14***a* be clipped off, so that there is no tendency for them to pierce the gums or inner cheek tissue of the patient.

The ends **14***a* may be cut off conveniently by the pincer-like distal end cutter tool of the present invention as designated **20** in FIG. 1. The tool **20** is grasped in the hand of the orthodontist, and is inserted into the mouth of the patient in the position shown in FIG. 1. The distal end **14***a* of the arch wire extends across the end section of the jaws of the tool **20**, which end section projects out from the plane of the remaining portion of the tool for convenience of manipulation, as shown in FIG. 1.

The jaws of the tool **20** are designated **22** and **24** in FIGS. 1 and 2, and it will be observed that a channel **22***a* is defined in the face of the jaw **22** and extends across the face and up the protruding end section, as will be described in more detail subsequently. Likewise, the jaw **24** defines a tongue **24***a* which extends across the face of the latter jaw and along the protruding end section. The tongue **24***a* is positioned to extend into the channel **22***a* when the handle sections **28** and **30** (FIG. 3) of the tool are squeezed together.

As shown in FIG. 6A, for example, the height of the tongue **24***a* is less than the depth of the channel **22***a* so that when the tool is operated to cut the end section **14***a* from the remaining part of the wire **14**, as shown in FIG. 2, the cut-off end **14***a* is held securely in the tool, during the cutting operation and until the jaws are opened, so that there is no tendency for the cut-off end to be "shot" into the gum or cheek tissue of the patient. The tongue **24***a* and channel **22***a* are defined cutting edges which are mutually engaged during the operation of the tool to sever the distal end **14***a* from the remaining part of the wire **14**.

As best shown in FIG. 5, for example, the end sections of the jaws **22** and **24** extend out from the plane of the remaining portions of the jaw section, and the channel **22***a* (shown in FIG. 5) together with the mating tongue **24***a* extend along the protruding sections to the extremities of the jaw, as shown in FIG. 8. Therefore, with the configuration shown, for example, the distal end cutter tool may be held in the position shown in FIG. 1, so that the distal end of the arch wire extends across the channel **22***a* of the protruding section of the jaw **22**, and when the handles **28** and **30** are squeezed together, the tongue **24***a* enters the channel **22***a* and the mating cutting edges cause the end **14***a* to be cut off from the remaining part of the arch wire **14**.

However, the configuration is such that the cut-off end is clamped between the jaws, as shown in FIG. 2, so that there is no tendency for it to "shoot" out and into the tissue of the patient. Also, the configuration of the channel **22***a* and tongue **24***a* is such that a smooth burrless end is provided on the remaining part of the wire **14**.

The tool may be formed, for example, of SAE 4063 steel. The jaws may be heat treated to Rockwell of C40–C45; and the cutting edges may be induction hardened to to a Rockwell of C60–C62, with a minimum depth of .015 inch.

The invention provides, therefore, a simple and effective pincer-like distal end cutter tool for conveniently cutting the distal ends from the arch wire within the mouth of the patient, this being achieved simply and expeditiously by the orthodontist, and without any possibility of injury to the patient.

What is claimed is:

1. A pincer-like distal end cutter tool for an arch wire, or the like, including:

a first member defining a first forward jaw section and a first rearward handle section; and

a second member defining a second forward jaw section and a second rearward handle section and hinged to said first member in a pincer-like relationship for mutual pivotal movement in uniplanar relationship; said first jaw section having a forward portion extending up out of the plane of said first member at an angle thereto and defining a channel extending longitudinally along the face of said forward portion, and said second jaw section having a forward portion extending up out of the plane of said second member at an angle thereto and defining a cutting member adjacent said channel, the edges of said channel and of said cutting member defining mutually related cutting edges for the end of an arch wire for severing said end when said handle sections are squeezed together.

2. The distal end cutter tool defined in claim 1, in which said forward portion of said second jaw section defines a tongue extending longitudinally along the face thereof as said cutting member, said tongue being positioned to enter said channel in said first jaw section when the aforesaid handle sections are squeezed together.

3. The distal end cutter tool defined in claim 2, in which the depth of said channel is greated than the height of said tongue so that the faces of said jaws serve to clamp and hold the end of the arch wire cut by said cutting edges during the operation of said cutter.

4. The distal end cutter tool defined in claim 2, in which said channel and said tongue extend along the respective forward portions of said jaws to the extremities thereof.

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ROBERT PESHOCK, Primary Examiner