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### (54) Headrest, in particular for dentist chairs

(57) The headrest (1) includes a locking mechanism (3) with two strips or plates (5,6) connected to each other at both ends and defining two transverse recesses (7,8) which receive respective articulating means connected to the headrest (1) and to a mounting post (12) slidably inserted into a suitable socket (13) made in the backrest (2) of the dentist chair. The locking mechanism (3) is equipped with a pneumatic control device (14) that clamps the plates (5,6) so that the articulating means are locked within the respective recesses (7,8).

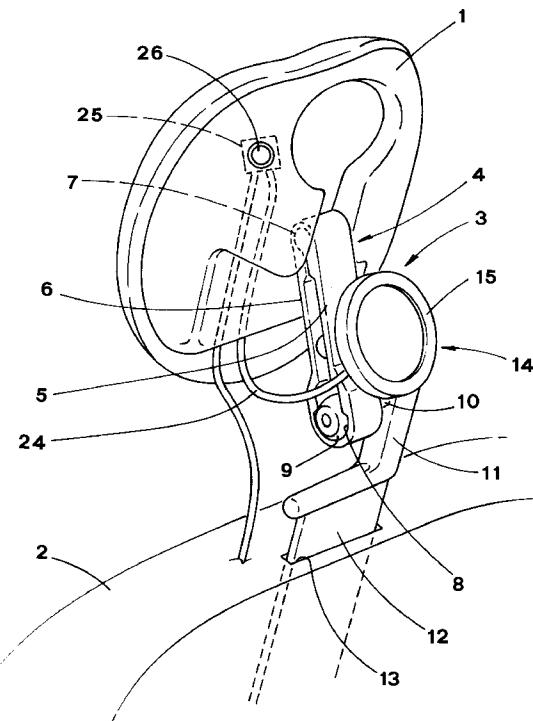


FIG.1

## Description

The present invention relates to production of chairs used for dental treatment.

It is known that in dental practice chairs are used in which position of the headrest, backrest and footrest can be varied with respect to the seat, so as to make easier for the dentist to operate in the patient oral cavity. In particular, movement possibility of the headrest with respect to the backrest is very important.

As a matter of fact, when the headrest is rigidly fastened to the backrest, patients take odd anomalous positions in the subsequent steps of the medical treatment. This can lead to uncomfortable situations, mainly when the treatment requires long operating time.

Some chairs have the headrest supported by a mounting post slidably friction-coupled with the backrest for height adjustment.

However, this does not allow for individual adjustment of the headrest, also in accordance with the position that the patient is to assume each time.

According to a known solution, that solves the problem only partially, the headrest is articulated to the upper end of an arm hinged with its bottom end to the wings of a fork shaped member. The shank of the fork shaped member slides with friction in a socket specially made in the chair backrest.

In this way, the headrest can be tilted according to vertical planes, and then it is possible to change the angle of slant thereof.

However, the positions that the headrest can take are the ones allowed by the related articulating connections, and do not always match the actual position taken time by time by the patient's head.

The result is that, when the dentist moves the headrest, the patient must conform himself to the new position of the headrest by moving the neck or the bust often assuming uncomfortable positions.

Patent Application No. BO92U 000046, of the same Applicant, avoids this disadvantage and discloses a headrest that is articulated to the back of the chair by connection means equipped with a spherical element, inserted in a related recess of a mechanism for locking the same headrest.

The spherical coupling allows the headrest to follow anatomically all the head movements, thus assuring a comfortable rest to the head in all its positions.

The headrest is locked in a each time selected working position by suitable mechanical means, e.g. operated by a lever, aimed at clamping the said connection means.

The object of the present invention is to improve the above mentioned headrest, so as to facilitate locking and releasing of the connection means of the backrest.

The above mentioned objects are obtained, in accordance with the invention, by providing the headrest described in the preamble of Claim 1 with the features as claimed therein. Further characteristic features and embodiments of the invention are described in claims 2

to 9.

The present invention is disclosed in detail in the following description with reference to the enclosed drawings, in which:

- 5
- figure 1 shows a perspective view of the subject headrest;
  - figures 2a and 2b show a longitudinal sectional view of the headrest locking mechanism, respectively in locking and releasing positions.

With reference to the above described figures, the headrest 1 of a dentist chair is fastened to the backrest 15 2 of the chair by a locking mechanism 3.

The locking mechanism 3 includes a retaining device 4 formed by two strips or plates 5 and 6 that are connected to each other at both ends and which define, at their ends, a first and a second transversal recess 7 20 and 8.

A pin, not seen in the drawing, integral with the headrest, is inserted into the first recess 7. A spherical element 9, integral with a support gudgeon 10, is inserted into the second recess 8.

25 The gudgeon 10 is connected, in cantilever fashion, to a protrusion 11 formed by the head of a mounting post 12, inserted and frictionally sliding in a suitable socket 13 specially made in the backrest 2.

The locking mechanism 3 features a pneumatic control device 14, aimed at clamping the plates 5, 6 of the retaining device 4 so as to lock the articulation means inside the respective recesses 7, 8.

More precisely, the control device 14 has a member 15 that forms a cylindrical chamber 16, in which a piston 35 17 sealably slides.

The member 15 is fastened to the first plate 5 of the retaining device 4 by a hollow tubular tang 18.

A free end of the stem 19 of the piston 17, that passes through the tubular tang 18, is fastened to the second 40 plate 6 of the retaining device 4 by means of a nut 20.

Angular position of the member 15 of the control device 14 with respect to the plate 5 is set by a pin 21 that prevents any reciprocal rotation thereof. Likewise, the piston 17 is linked with the member 15 by means of another pin 22.

45 The connection 23 of an air supplying duct 24 leading to a suitable delivery of compressed air, is linked with the cylindrical chamber 16.

A two-way valve 25, operated by a push button 26, 50 controls the supplying duct 24. In the present case, the push button 26 is situated at the back of the headrest 1.

Obviously, this push button can be situated in any other suitable position that allows the dentist to operate it easily. It is also possible to activate the valve 25 by 55 means of a pedal button or the like.

The possibilities of use of the headrest are obvious from the description and with reference to the enclosed figures. In the locking position, the plates 5, 6 of the re-

taining device 4 are clamped by the action of the piston 17 of the control device 14 (see fig. 2a).

The piston 17 is pushed by the pressure created inside the cylindrical chamber 16, due to the air supplied by the duct 24.

Obviously, this pressure is suitably set so as to supply a pre-determined suitable pressing force.

It is to be pointed out that the piston 17 has wide diameter, and is in fact in disk-like form, so as to present bigger surface for pneumatic pressure and, consequently, bigger pressing force without necessity of increasing the pressure.

Axial movements of the piston 17 are relatively short. The orientation of the headrest is changed by operating the push button 26 of the valve 25, so as to connect the cylindrical chamber 16 of the control device 14 with a discharge outlet thus allowing the air to come out of the chamber.

In this way, the piston 17 can return inside the cylindrical chamber 16, as a result of the elastic reaction movement of the plates 5,6, which move away from each other, provoking releasing of the articulation means of the headrest 1 (fig. 2b).

Then, the headrest 1 can pivot about the axis of the pin connected with the seat 7 and follow, due to the spherical element 9, all the movements of the patient's head.

When the button 26 is released, the air in the chamber 16 is compressed again and the piston 17 takes the last defined position by making the plates 5, 6 move closer to each other and clamping the articulation means of the headrest (see again fig. 2a).

The described technical solution facilitates locking and releasing of the means connecting the headrest to the chair back.

In particular, the releasing of the headrest 1 does not require any effort of the dentist, since it is operated by the button 26 of the valve 25.

The pneumatic control allows for suitable adjustment of the force clamping the locking mechanism 3.

It is also to be pointed out that the cylindrical chamber 16 of the control device 14 is very small, therefore the consumption of the compressed air is proportionally limited.

Hydraulic, electric or electromagnetic control means can be used instead of the pneumatic means, for locking and releasing the means connecting the headrest to the chair back.

## Claims

1. Headrest, in particular for dentist chair, including a locking mechanism (3) with two strips or plates (5,6), a first plate (5) and a second plate (6) respectively, connected to each other at both ends and defining two transverse recesses (7,8) which receive respective articulating means connected to the headrest

(1) and to a mounting post (12) slidably inserted into a socket (13) made in the backrest (2) of the dentist chair, the said headrest being characterised in that the said locking mechanism (3) includes a control device (14) that clamps the plates (5,6) so that the articulating means are locked within the respective recesses (7,8).

2. Headrest, according to claim 1, characterised in that the said control device (14) is pneumatic.
3. Headrest, according to claim 2, characterised in that the said pneumatic control device (14) is supplied with compressed air by a supplying duct (24), connected to a suitable delivery of compressed air, with a two-way valve (25) operated by a push button (26) for delivery or discharge of compressed air to and from the said control device (14).
4. Headrest, according to claim 3, characterised in that the said button (26) connects the control device (14) with a discharge outlet, so as to release the articulation means situated in the respective recesses (7,8).
5. Headrest, according to claim 2, characterised in that the said pneumatic control device (14) features a member (15), fastened to the said first prong (5) of the locking mechanism (3), and delimiting a cylindrical chamber (16), in which a piston (17) is sealingly made to slide, with the stem (19) of the said piston (17) fastened to the said second plate (6) of the locking mechanism (3).
6. Headrest according to claim 5, characterised in that the member (15) is fastened to the said first plate (5) of the locking mechanism (3) by means of a tubular tang (18), through which the stem (19) of the piston (17) passes, a free end of the said stem (19) being fastened to the said second plate (6).
7. Headrest, according to claim 1, characterised in that the said control device (14) is hydraulic.
8. Headrest, according to claim 1, characterised in that the said control device (14) is electric.
9. Headrest, according to claim 1, characterised in that the said control device (14) is electromagnetic.

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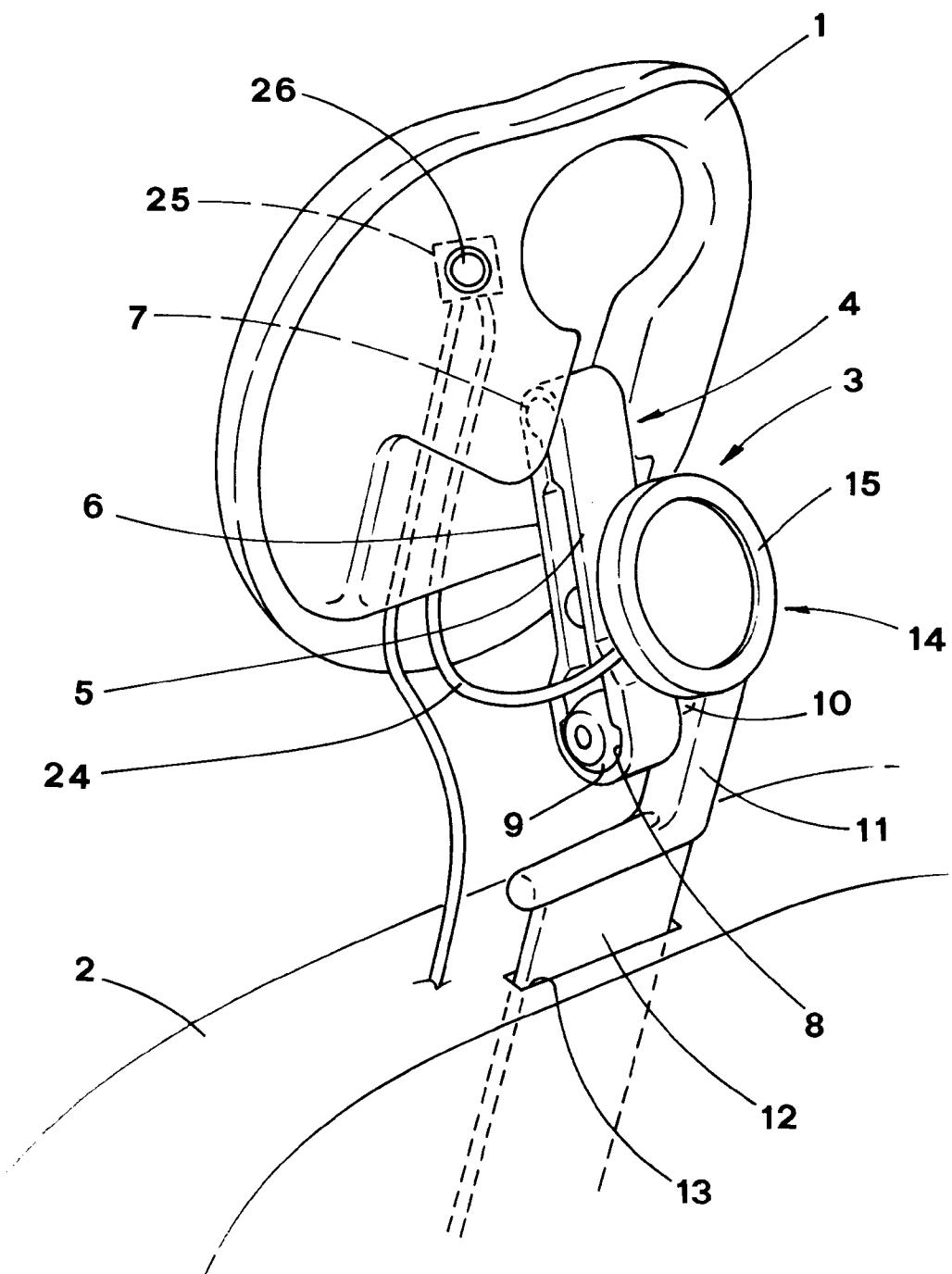
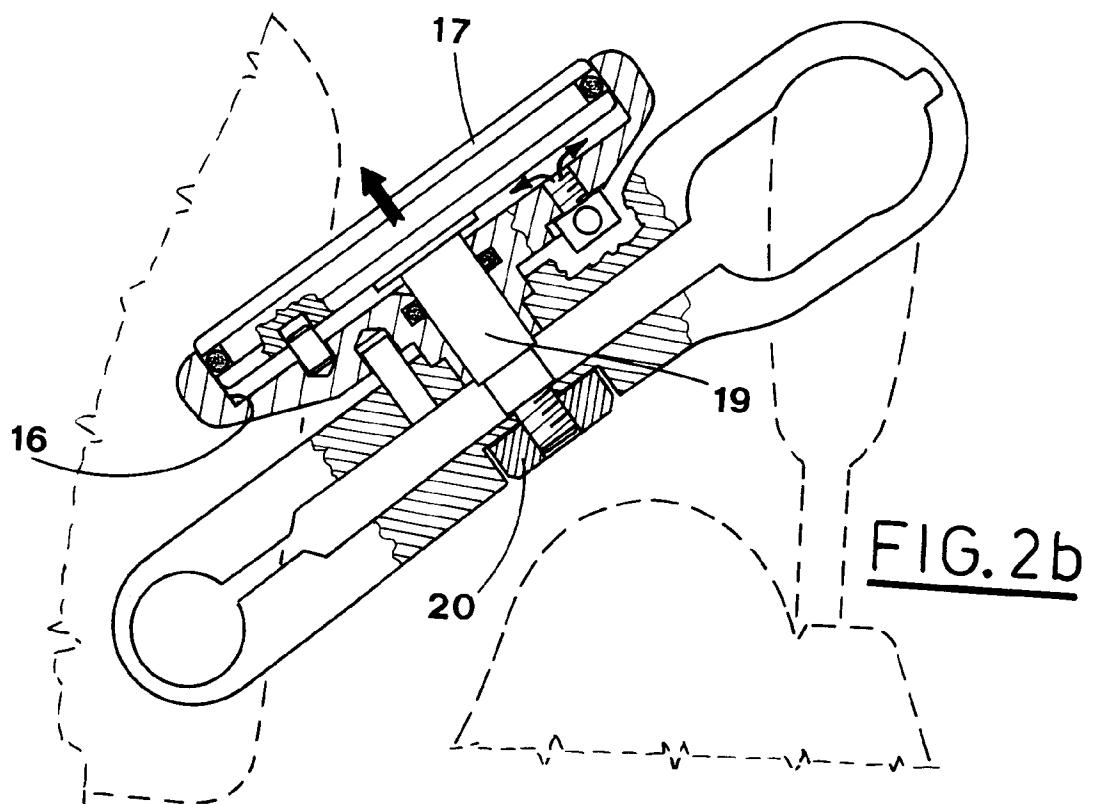
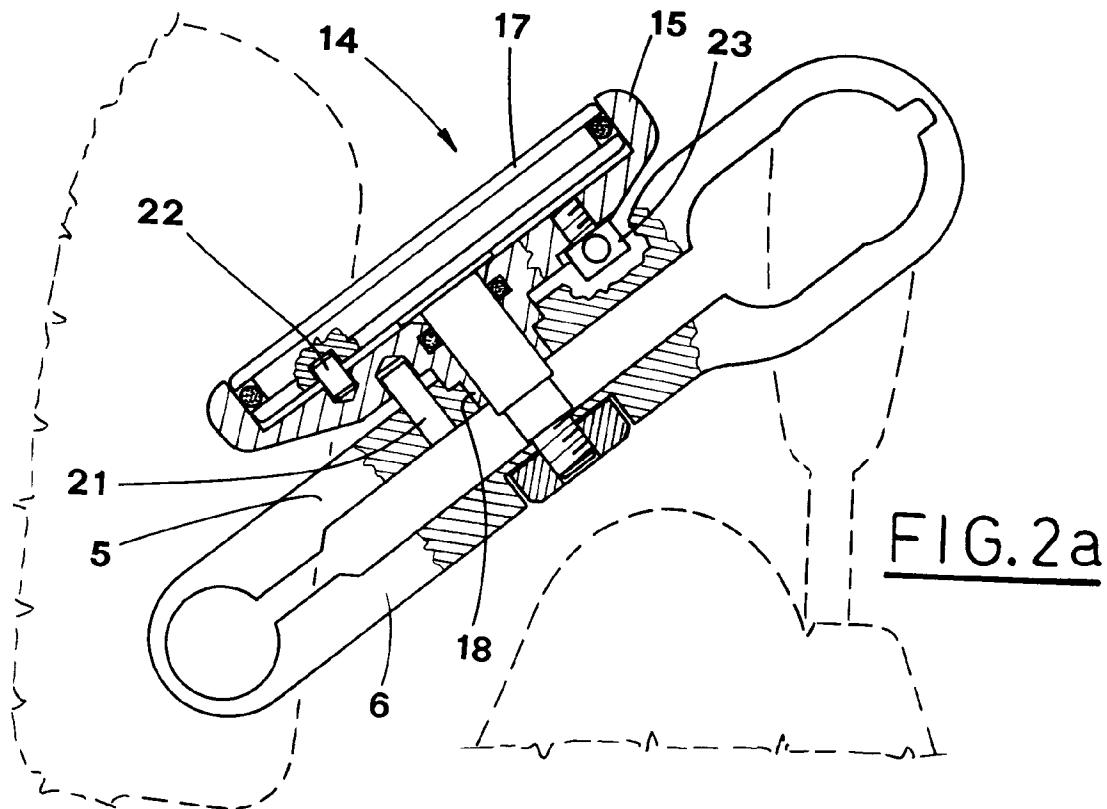


FIG.1





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## EUROPEAN SEARCH REPORT

Application Number  
EP 95 83 0372

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	DE-C-469 771 (BELDAM-WERKE) * the whole document *	1-9	A61G15/12
Y	DE-B-12 27 189 (MAHUTEAUX) * the whole document *	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A61G A47C
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	8 December 1995	Baert, F	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			