

[54] **ADJUSTABLE HEADREST FOR DENTAL CHAIRS**
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[58] Field of Search 297/391, 396, 408-410

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[57] **ABSTRACT**

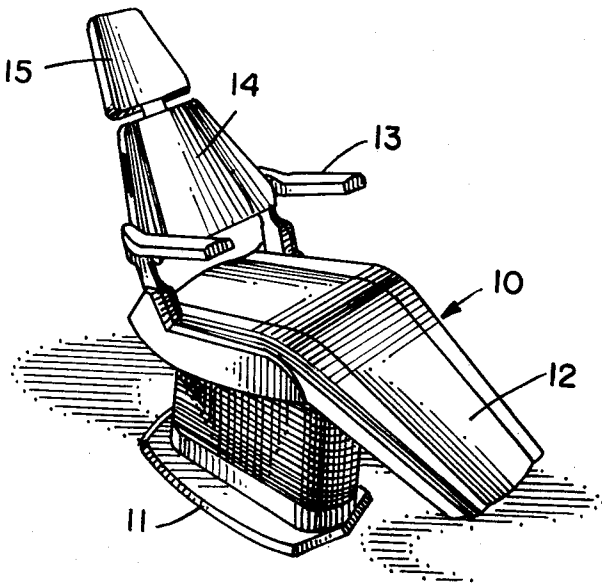
An adjustable headrest particularly suitable for use in combination with dental chairs. The headrest is provided with a depending bar which is slidably received in a passage or channel within the backrest. Spring means and friction locking means within the backrest cooperate with the bar to secure it in any selected position of adjustment.

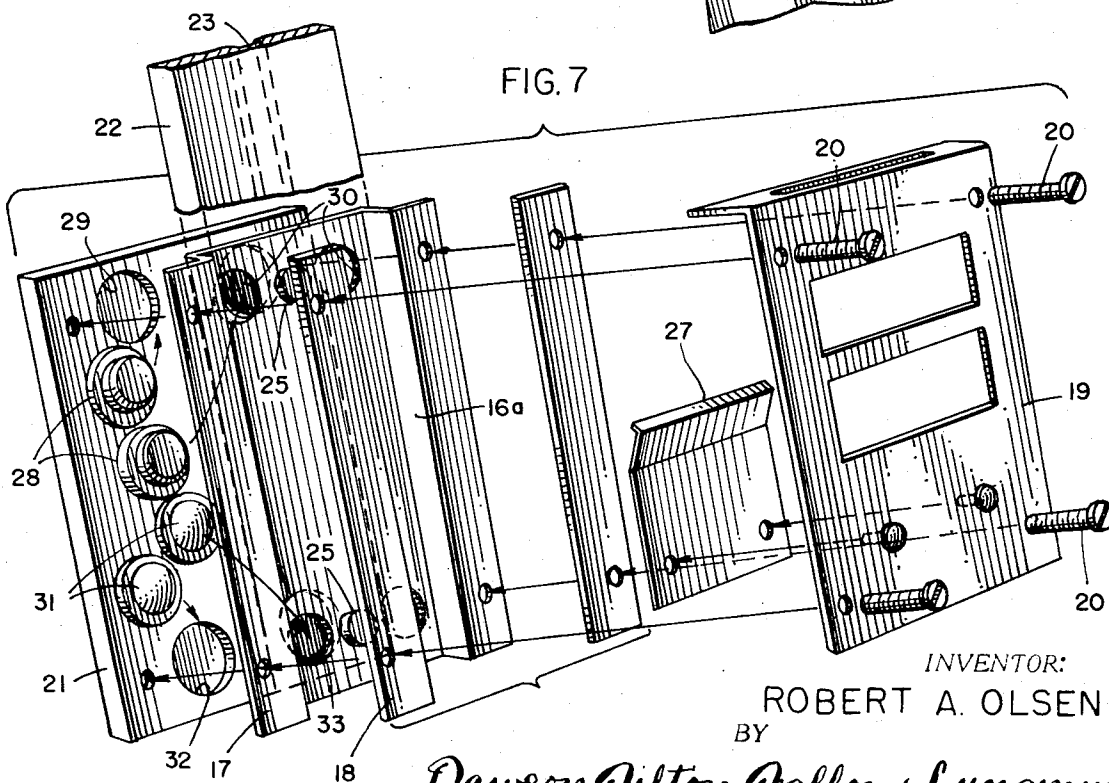
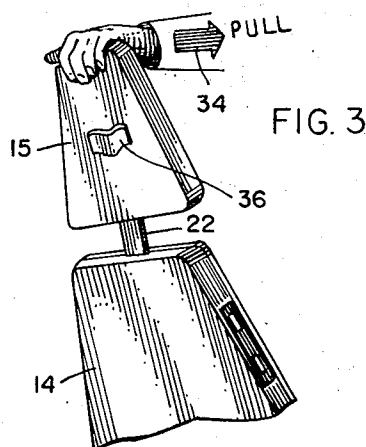
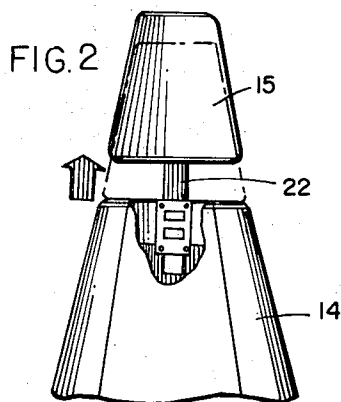
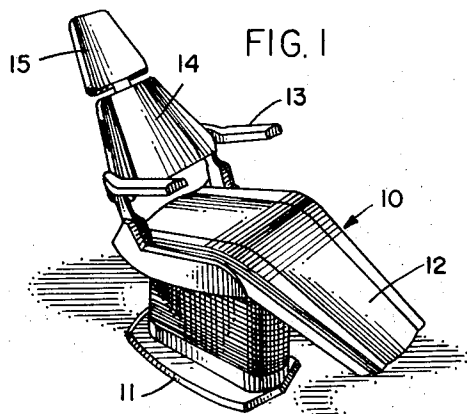
16 Claims, 7 Drawing Figures

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FIG. 4

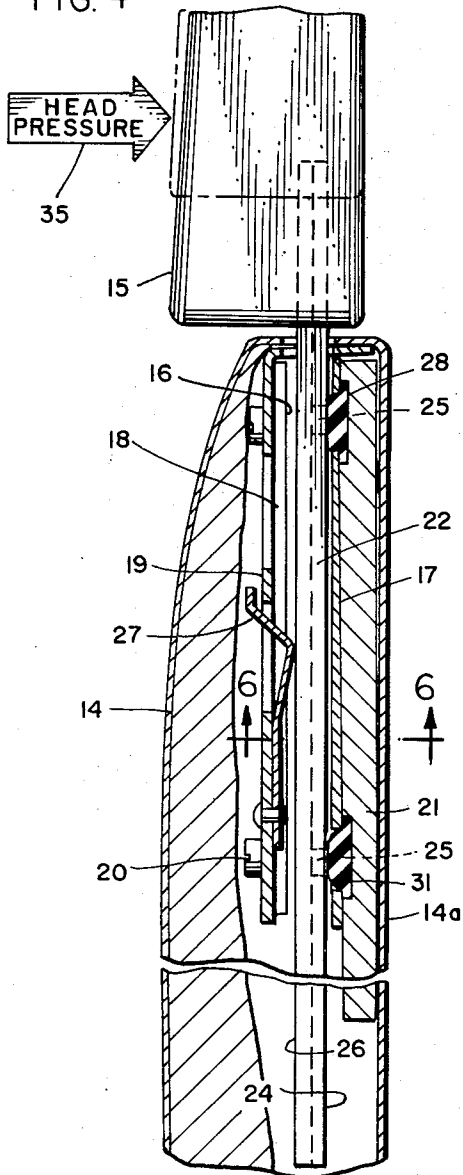


FIG. 5

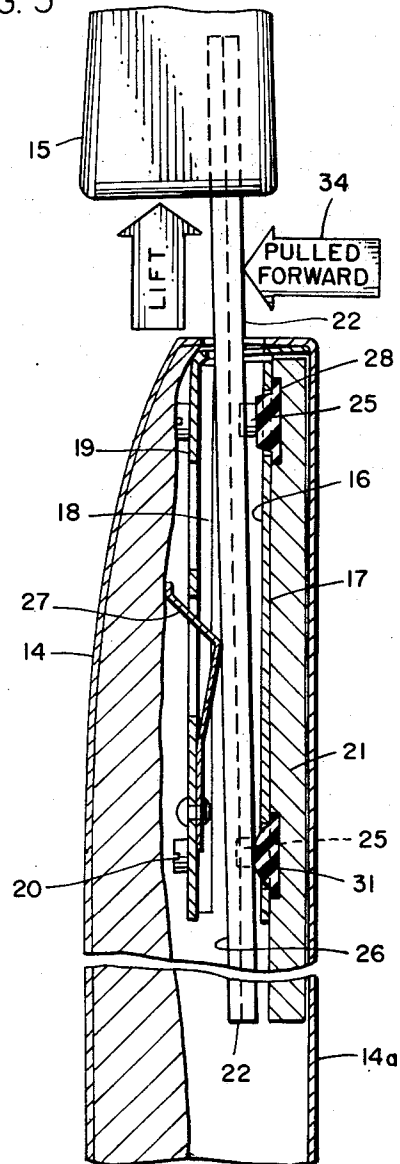
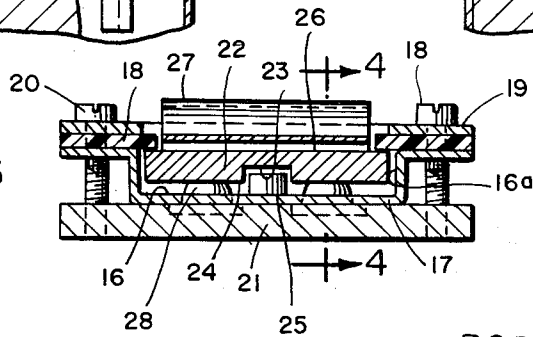


FIG. 6



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ADJUSTABLE HEADREST FOR DENTAL CHAIRS

BACKGROUND

While adjustable headrests for dental chairs have long been known in the art, such headrests are usually awkward to adjust, requiring the dentist or attendant to use both hands, and sometimes fail to remain in their selected positions of adjustment. It is apparent that should a headrest unexpectedly shift in its position while dental work is being performed, serious injury to the patient might conceivably occur. Some prior headrests have been developed which overcome such dangers by providing a series of positive latching positions for the headrests; however, because the number of positions is limited, adjustability and patient comfort have been sacrificed in order to achieve greater security and reliability.

SUMMARY

The headrest of the present invention achieves the important advantages of ease of adjustability and an infinite number of positions within a given range of adjustment while, at the same time, providing a high degree of security against headrest movement when the chair is in use.

With respect to adjustability, a dentist or attendant may readily shift the headrest into any of an infinite number of vertical positions to suit the patient and the dentist. Furthermore, such adjustment may be made, where necessary, using only one hand, a definite advantage in those instances where some further adjustment is required or desired after dental work has commenced or after the dentist has positioned himself at the side of the chair.

Although the headrest is capable of an unlimited number of positions of adjustment within its range of movement, security against displacement from any selected position is nevertheless achieved, partly because of a highly effective friction locking means, and partly because of the weight or force of a patient's head against the headrest increases the locking force.

These objectives are achieved by providing the headrest with a depending bar which is slidably received within a passage or channel extending downwardly into the backrest. The bar is non-circular, preferably rectangular, in cross section, and its front-rear thickness is substantially less than the corresponding dimension of the passage, thereby permitting the bar to be tipped or angled to a limited extent within the passage. Near the top of the passage, and at the rear thereof, is at least one friction pad which, upon engagement with the bar, prevents it from sliding axially within the passage. A spring slidably engaging the front surface of the bar urges the bar into firm frictional engagement with the pad and the rearward force of the patient's head against the headrest further increases the locking action. Release of the frictional force, for purposes of shifting the headrest into a different position of adjustment, is achieved simply by urging the headrest forwardly to overcome the spring force and to tip the bar forwardly in its channel or passage.

DRAWINGS

FIG. 1 is a perspective view of a chair equipped with the headrest-backrest combination of the present invention;

FIG. 2 is a front elevational view, partly broken away, of the backrest and adjustable headrest;

FIG. 3 is a rear perspective view illustrating the direction of force required for releasing the locking means;

FIG. 4 is a vertical sectional view illustrating portions of the backrest and headrest with the headrest in a normally locked position;

FIG. 5 is a vertical sectional view similar to FIG. 4 but illustrating the adjustable headrest in a released or unlocked position;

FIG. 6 is a horizontal sectional view of the channel, bar, friction pads, and spring, taken along line 6—6 of FIG. 4;

FIG. 7 is an exploded perspective view of the parts defining the channel or passage and showing the relation thereto of the friction pads, bar, pivot elements, and spring means.

DETAILED DESCRIPTION

Referring to FIG. 1, the numeral 10 generally designates a dental chair having a base 11, a seat and leg rest 12, armrests 13, backrest 14, and headrest 15. The headrest is in effect an upward extension of the backrest and is generally disposed in the same plane as the backrest. Normally the backrest and headrest extend upwardly in a generally vertical direction and, to facilitate orientation and description, will be so described herein. It should be understood, however, that the entire backrest, along with the headrest connected thereto, may be tipped rearwardly into a reclining position and that therefore the term "vertical" in referring to the backrest is intended only as a reference in defining the relationship between the backrest and other parts.

Referring to FIG. 4 and 5, it will be observed that the padded backrest 14 is provided with a vertical channel or passage 16 which is open at the top of the backrest. The passage is defined by a rear channel-shaped member 17 (FIG. 6), a pair of vertical guide strips 18, and a front plate 19, all secured by screws 20 or by other suitable connecting means to a rear mounting member 21. The mounting member 21 is in turn secured by welding or by any appropriate attachment means to the inside surface of the rear panel 14a of the backrest or may, if desired, be formed integrally with the rear panel.

Passage 16 is of substantially uniform cross sectional dimensions throughout its entire vertical extent and, preferably, is of rectangular cross sectional configuration with its width being greater than its depth (FIG. 6). The passage slidably receives a tongue or bar 22 which is secured to headrest 15 and extends downwardly therefrom. As shown in FIGS. 6 and 7, the bar 22 is similarly of non-circular (rectangular) cross section and is of substantially uniform cross sectional dimensions throughout its entire vertical extent. In the embodiment illustrated, the bar has a longitudinal groove or recess 23 along its rear surface 24 for slidably receiving a pair of vertically-spaced guide pins 25 secured along the longitudinal mid line of channel member 17 (FIG. 6). The two guide pins or studs are spaced vertically apart (FIGS. 4 and 5) and serve to prevent lateral displacement and possible binding contact between the bar 22 and the sides 16a of the channel or passage.

It will be observed from FIGS. 4-6 that the thickness of the bar 22 — that is, the distance between rear surface 24 and front surface 26 — is substantially less than the corresponding front-rear dimension of the passage 16, such dimension being defined by the distance between the inside forwardly-facing surface of channel member 17 and the rearwardly-facing surfaces of guide strips 18. Because of the dimensional difference between the thickness of the bar and the depth of the passage, the bar is capable of a limited extent of forward-rearward tipping movement within the passage (FIGS. 4 and 5).

A leaf spring 27, secured to front plate 19, bears rearwardly against the bar 22 at a point intermediate the upper and lower ends of the passage (FIGS. 4 and 5). The spring slidably engages the bar and urges it rearwardly with sufficient force to direct the rear surface of the bar into firm frictional engagement with one or more slip-resistant members or pads 28. In the embodiment illustrated in the drawings, a pair of such pads are shown; however, it is to be understood that a greater or smaller number may be provided. The pads are disposed adjacent the upper end of the channel or passage and project into that passage to make direct contact with the rear surface of the bar. While the pads may be fixed in place by any suitable means, an effective arrangement is to mount them in recesses 29 in mounting member 21 so that they project forwardly through openings 30 in the wall of channel member 17 (FIG. 7). To insure proper retention of the pads, each pad is generally hat-shaped in configuration, the rim portion of larger diameter being retained in recess 29 by channel member 17.

As shown in the drawings, the pads or resistance elements have flat forwardly-facing surfaces adapted to engage the flat rearwardly-facing surface portions of the bar 22. The pads may be formed of any suitable resilient material capable of resisting sliding contact with the bar. Rubber, natural and synthetic, has been found effective but plastics and other materials having similar anti-skid properties may be utilized.

Anti-friction means in the form of one or more bearing elements 31 may be provided near the lower end of the passage along the rear surface thereof. Like the friction pads, each bearing element 31 may be mounted in a recess 32 in mounting member 21 and projects forwardly through an opening 33 in channel member 17. However, unlike the friction pads, the bearing elements 31 are formed of a hard, durable plastic or other suitable material which tends to be self-lubricating in its properties and which slides readily with regard to the smooth rear surface of bar 22. Furthermore, as shown most clearly in FIGS. 4 and 5, bearing elements 31 have rounded forward surfaces rather than the relatively flat contact faces characteristic of the anti-friction pads 28.

Spring 27 is disposed at a point intermediate friction pads 28 and bearing elements 31, and on the opposite or front side of bar 22, and therefore urges the bar rearwardly into forceful contact with both the friction means and the bearing means (FIG. 4). The force of the spring and the contact between friction pads 28 and bar 22 is more than adequate to maintain the headrest 15 in any selected position of vertical adjustment in the absence of a substantial opposing (forward) force exerted upon the headrest cushion in the direction of

arrow 34 in FIGS. 3 and 5. Furthermore, the locking or holding force exerted by spring 27 is complemented by the rearward force exerted upon the headrest cushion, as represented by arrow 35 in FIG. 4, when the headrest is in use. Thus, the rearward force exerted upon the headrest by a patient's head adds to the already-effective locking force exerted by the spring.

When the position of adjustment of the headrest is to be changed, the dentist or attendant forcefully urges the headrest pad forwardly, either by a pushing or pulling action, to tip bar 22 forwardly within channel 16 and out of frictional contact with pads 28. When so released, the bar may be shifted either downwardly or upwardly and, if desired, may be removed completely from the passage in those instances where presence of the headrest might be obstructive rather than helpful as, for example, in treating small children whose size renders use of the headrest unnecessary.

To facilitate adjustment of the headrest with the use of only one hand, the back surface of the headrest pad may be provided with a handle strap or loop 36 as illustrated in FIG. 3. The dentist may simply hook one or more fingers beneath the handle strap 36 so as to give purchase for either raising or lowering the headrest, and then, using the same hand, urges the headrest pad forwardly in the direction of arrow 34. It has been found, however, that use of the handle strap is not essential for one-handed adjustment of the headrest and that an operator may normally make such adjustment simply by gripping the headrest either from the rear or from the front (as illustrated in FIG. 3) to urge it forwardly and, at the same time, either upwardly or downwardly.

While in the foregoing I have disclosed an embodiment of the invention in considerable detail for purposes of illustration, it will be understood by those skilled in the art that many of these details may be varied without departing from the spirit and scope of the invention.

I claim:

1. In combination, a backrest for a chair, said backrest having a generally vertical passage opening at the top thereof, a headrest equipped with a depending bar slidably received in said passage, said bar having a pair of opposite surfaces spaced substantially closer together than the corresponding dimension of said passage to permit limited tipping movement of said bar within the passage, said passage having at least one slip-resistant member positioned for contact with one of said opposite surfaces of said bar when said bar is urged into engagement therewith, and spring means disposed within said passage and slidably engaging the other of said opposite surfaces of said bar to urge said one surface into frictional contact with said slip-resistant member, said bar being releasable for vertical adjustment by manually tipping the same out of contact with said member.

2. The structure of claim 1 in which said slip-resistant member is disposed adjacent the top opening of said passage.

3. The structure of claim 2 in which at least one bearing element is secured within said passage at a substantial distance below said slip-resistant element for sliding pivotal engagement with said one side of said bar.

4. The structure of claim 3 in which said spring engages said bar at a point spaced below said slip-resistant member and above said bearing element.

5. The structure of claim 1 in which said member comprises a pad of resilient slip-resistant material.

6. The structure of claim 1 in which said bar is of substantially uniform cross section throughout its entire length.

7. The structure of claim 6 in which said bar is of generally rectangular cross section.

8. The structure of claim 1 in which handle means are provided by said headrest for manually gripping and shifting the same into selected positions of adjustment.

9. In combination, a backrest for a chair, said backrest having a generally vertical passage extending downwardly from an opening at the top thereof, a headrest equipped with a depending bar slidably received in said passage, said bar having front and rear surfaces spaced substantially closer together than the front-rear dimension of said passage to permit limited forward-rearward tipping movement of said bar within said passage, said passage having at least one slip-resistant member engagable with the rear surface of said bar, spring means disposed within said passage and slidably engaging the front surface of said bar to urge said rear surface into frictional engagement with said slip-resistant member, said headrest being releasable for vertical adjustment by manually tipping the upper portion thereof forwardly out of frictional contact with

said slip-resistant member and thereafter sliding said bar within said passage.

10. The structure of claim 9 in which said slip-resistant member is disposed adjacent the top opening of said passage.

11. The structure of claim 10 in which a second slip-resistant member is disposed within said passage adjacent the top opening thereof, said slip-resistant members being positioned to contact said bar at laterally-spaced contact points.

12. The structure of claim 10 in which said slip-resistant member is provided with a generally flat surface engagable with said bar.

13. The structure of claim 12 in which said member comprises a pad of resilient slip-resistant material.

14. The structure of claim 9 in which at least one bearing element is secured within said passage at a substantial distance below said slip-resistant member for sliding pivotal engagement with the rear surface of said bar.

15. The structure of claim 14 in which said spring engages said bar along said front surface at a point spaced below said slip-resistant member and above said bearing element.

16. The structure of claim 9 in which said bar is of generally rectangular cross section, said cross section being uniform along substantially the entire longitudinal extent of said bar.

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