March 6, 1973 G. A. FORTNAM 3,719,388

ADJUSTABLE HEADREST ASSEMBLY FOR A DENTAL CHAIR

Filed May 12, 1971 2 Sheets-Sheet 1

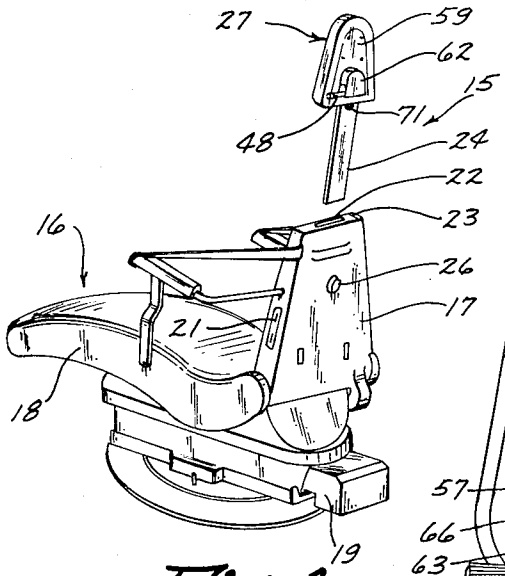


Fig. 1

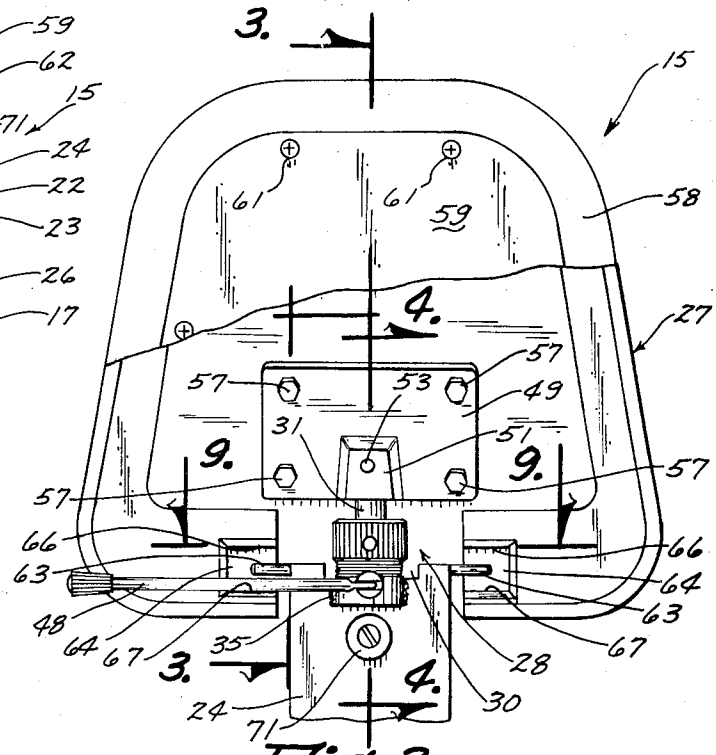


Fig. 2

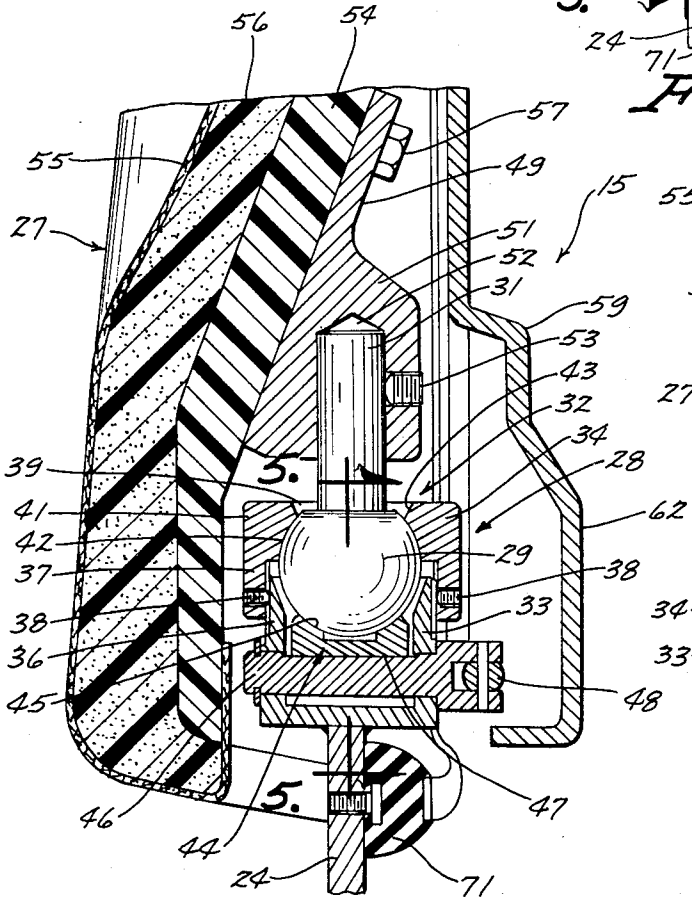


Fig. 4

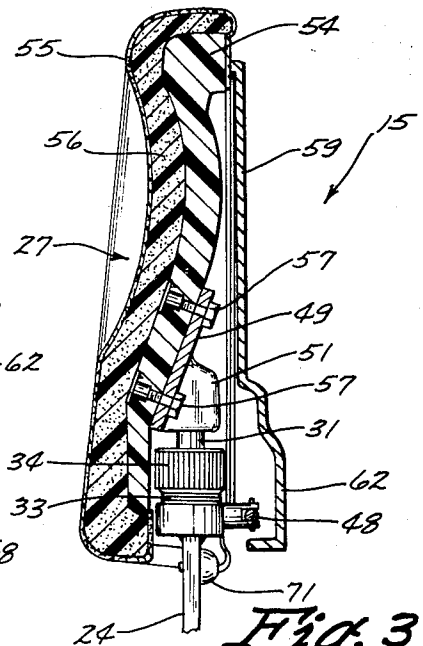


Fig. 3

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ADJUSTABLE HEADREST ASSEMBLY FOR A DENTAL CHAIR

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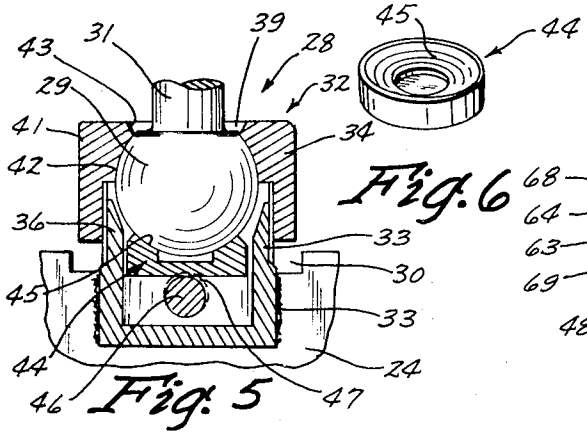


Fig. 6

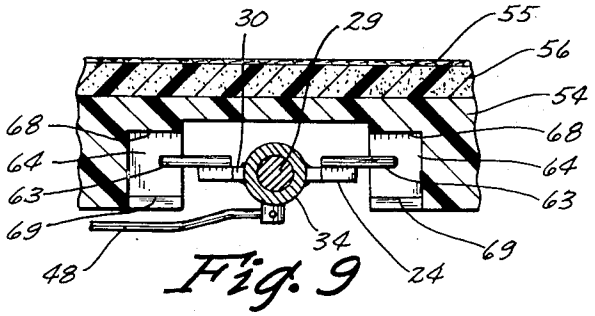


Fig. 9

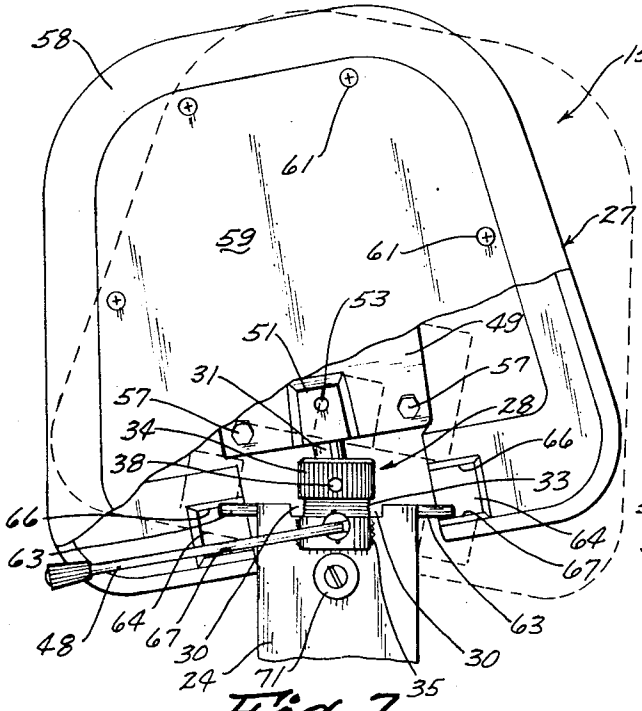


Fig. 7

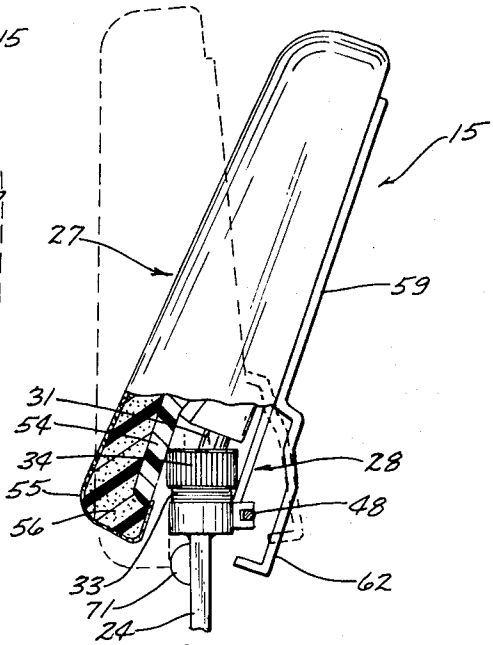


Fig. 8

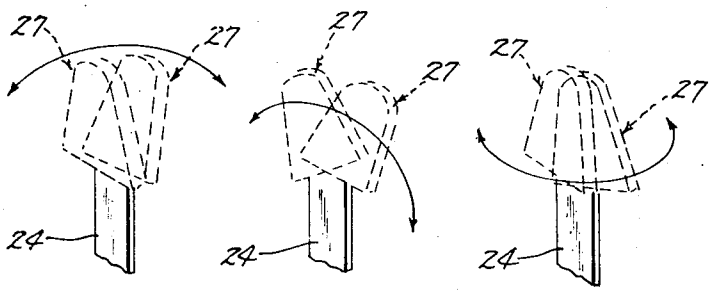


Fig. 10 Fig. 11 Fig. 12

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ADJUSTABLE HEADREST ASSEMBLY FOR A DENTAL CHAIR

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Int. Cl. A47c 7/38
U.S. Cl. 297—405 2 Claims

ABSTRACT OF THE DISCLOSURE

The headrest assembly has a head receiving depression in the front surface thereof for holding the head in a comfortable, yet secure position at all times. To permit convenient access to all tooth surfaces to be worked on the headrest assembly is swivelly mounted on the backrest of a dental chair for adjustable movements laterally and transversely of the backrest and for rotational movement about an upright axis. A single conveniently located lever is readily actuated to release the headrest from and to lock the headrest in an adjustably moved position.

SUMMARY OF THE INVENTION

The headrest assembly is of a pleasing over-all appearance and easily manipulated to an adjusted position by a dentist without patient discomfort or annoyance. The patient's head is at all times received in a fully supported position in a head receiving pocket or cavity so that the patient's head and the headrest are movable together to a desired adjusted or working position within a predetermined range of movements. The swivel support of the headrest on the chair backrest and its direct manipulation by the chair operator provides for adjustments being made quickly and easily with a minimum of interference with any dental work in process.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a rear perspective view of a dental chair showing the headrest assembly of this invention in a position to be assembled therewith;

FIG. 2 is an enlarged rear elevational view of the headrest with parts broken away to more clearly show its construction;

FIG. 3 is a sectional view as seen on line 3—3 in FIG. 2;

FIG. 4 is an enlarged sectional detail view taken along line 4—4 in FIG. 2;

FIG. 5 is a sectional detail view of a swivel assembly as seen on line 5—5 in FIG. 4;

FIG. 6 is a perspective view of an adjustable member which forms part of the swivel assembly shown in FIG. 5;

FIG. 7 is illustrated similarly to FIG. 2 with parts shown in changed positions;

FIG. 8 is illustrated similar to FIG. 3 with parts shown in changed positions;

FIG. 9 is a sectional detail view taken on line 9—9 in FIG. 2; and

FIGS. 10, 11 and 12 are diagrammatic illustrations showing the adjustment of the headrest relative to a plurality of axes.

DETAIL DESCRIPTION OF THE INVENTION

The headrest assembly of this invention, indicated generally as 15 in FIG. 1, is intended for use with a dental

chair 16 having a backrest 17 pivotally connected with a contoured seat and leg rest 18 which is mounted on a vertically adjustable floor supported base structure 19. The backrest 17 is movable to an adjusted position relative to the seat and leg rest 18 and the chair vertically moved on the base structure 19 by respective motor means (not shown) operable in a usual manner by control buttons 21 conveniently located on the backrest 17 for manipulation by a dentist or chair operator. The backrest 17 is formed with an upright cavity or socket 22 open to and located centrally of the top surface 23 of the backrest and of a size and shape to receive in a telescopic relation a depending tongue member 24 that comprises part of the headrest assembly 15. The tongue member 24 is longitudinally adjustable within the cavity 22 to provide for the vertical adjustment of the headrest assembly 15 relative to the backrest 17 to accommodate the height of a patient seated within the chair 16. This adjustment is maintained by a locking screw 26 carried in the backrest 17 for movement into and out of locking or clamping engagement with the tongue member 24.

In its locked position with the backrest 17 the tongue member 24 functions as a mounting member for a swivel unit 28 which swivelly supports a headrest unit 27 (FIGS. 2 and 4) for pivotal movement laterally and transversely of the tongue member and for rotational movement about the axis of the swivel unit. The swivel unit 28 includes a ball member 29 that is integrally formed with an upwardly projected stem or shank member 31 and an associated socket means 32 comprised of a lower cup-shaped section 33 and an upright inverted cup-shaped section 34. The lower cup section 33 is positioned within a notch 30 in the top side of the tongue member and is rigidly secured to the tongue member as by weldments 35.

As shown in FIG. 4, the side wall 36 of the lower cup section 33 is externally threaded for threaded engagement with the internally threaded side wall 37 of the upper cup section 34. This threaded connection of the cup sections 33 and 34 is maintained by a locking or friction screw 38 threadable laterally through the side wall of the upper cup section 34 for engagement with the side wall of the lower cup section 33. The ball member 29 is received within the compartment formed by the cup sections 33 and 34 with the stem 31 thereof extended through an enlarged central opening 39 formed in the base wall 41 of the upper cup section 34. The opening 39 has a first side wall portion 42 of a shape corresponding to the curvature of the upper portion of the ball member 29 so as to form a stationary socket portion for the ball member. A second side wall portion 43 of the central opening 39 is sloped upwardly and outwardly in a concentrically spaced relation with the stem member 31 to provide for a tilting movement of the stem 31 within the opening 39.

Positioned within the lower cup section 33 (FIG. 5) for up and down movement axially thereof is a locking member 44 of a generally disc shape having an upper surface 45 of a size and shape for bearing engagement with the lower portion of the ball member 29. With the surface 45 of the locking member 44 in contact with, but out of locking engagement with the ball member 29, the ball member is freely and swivelly movable relative to the socket means 32 to a desired adjusted position of the head rest unit 27. With the headrest unit 27 in an adjusted position the ball member 29 is locked against move-

ment within the swivel means **32** by an upward movement of the locking member **44** to clamp the ball member between the surfaces **42** and **45** on the upper cup section **34** and locking member **44**, respectively.

Movement of the locking member **44** into and out of locking engagement with the ball member **29** is accomplished by means including an elongated cam member **46** (FIGS. 4 and 5) extended diametrically through the side wall **36** of the lower cup section **33** with end portions thereof rotatably mounted in opposite portions of the cup side wall **36** and a cam section **47** located within the cup section **33** for bearing engagement against the under side of the locking member **44**. On rotation of the cam member **46** in one direction the locking member **44** is engaged and moved by the cam section **47** into locking engagement with the ball member **29**. On rotation of the cam member **46** in an opposite direction the locking member **44** is permitted to move out of locking engagement with the ball member **29**.

This action of the locking member **44** into and out of locking engagement with the ball member **29** is initially set up and then maintained by the provision for relative axial movement of the cup sections **33** and **34**. Thus with the ball member **29** located within the cup sections and the cam section **47** in a ball release position relative to the locking member **44**, the cup sections **33** and **34** are threadably adjusted until the ball member **29** is snugly fitted between the upper cup section **34** and the surface **45** of the locking member **44**. This adjusted position of the cup sections **33** and **34** is rigidly secured by the locking screws **38**. On movement of the cam section **47** to a ball locking position, therefore, the ball member **29** is frictionally clamped between and in locking engagement with the surface **45** of the locking member **44**, and the surface **42** of the upper cup section **34**.

The headrest unit **27** includes a plate member **49** (FIGS. 2 and 3) having an integral lower enlarged section **51** formed with a downwardly facing hole **52** to receive the ball stem **31**. The plate member **49** is secured to the stem **31** in a usual manner by a friction screw **53**. A base or mounting member **54** of a plastic composition for supporting a resilient contoured head member **56** is attached to the plate member by screws **57**.

The head member **56** (FIGS. 3 and 4) has a rear surface of a shape for full mating engagement with the entire front surface of the base member **54**. A covering material **55** such as a fabric reinforced vinyl is fitted over the head member **56** with the marginal portion thereof extended over a marginal rim **58** formed on the rear side of the base member **54**. A rear cover plate **59** of a size and shape to fit over the marginal rim **58** is secured as by screws **61** to the base member **54**. A housing portion **62** integrally formed with the rear cover plate **59** shields the swivel unit **28**. The handle member **48** is projected from one side of the housing portion **62** to provide for its manipulation by either the left or right hand of the chair operator.

It is seen, therefore, that with the handle member **48** actuated to release the ball member **29** for a swivel movement of the stem **31** that the head rest unit **27** is concurrently or separately movable relative to a plurality of axes having a common origin in the longitudinal axis of the tongue member **24**. To limit the range of adjustable movement of the head rest unit **27** the upper end of the tongue member is provided with a pair of transversely opposite laterally extended fingers **63**. Corresponding to the fingers **63** is a pair of cavities or recesses **64** formed in the base member **54** at opposite sides of the tongue member **24**. Each cavity has an upper wall **66**, a lower wall **67**, a front wall **68** and an open rear side **69**. A finger **63** extends horizontally within an adjacent cavity **64** at a position intermediate the upper and lower walls thereof and spaced from the front wall **68** when the headrest unit **27** is in a neutral position, namely, the ball member stem **31** is in coaxial alignment with the longitudinal axis of the tongue member **24**.

Pivotal or tilting movement of the headrest unit **27** in a direction transversely of the tongue member **24** is limited by the engagement of the ends of the fingers **63** with an upper or lower wall of a cavity **64** as shown in FIG. 7. In other words, on movement of a cavity wall **66** or **67** into engagement with a finger **63**, the head rest unit has been transversely tilted to a maximum position as illustrated diagrammatically in FIG. 11.

A rotational movement of the headrest unit **27** about the axis of the ball stem member **31** (FIGS. 9 and 12) is limited by the engagement of one of the fingers **63** with the front wall **68** of one of the cavities **64**. The extent of this rotational movement of the headrest unit **27** is thus initially determined by the distance between a front wall **68** and its corresponding finger **63** when the headrest unit is in the neutral position therefor.

The tilting or pivotal movement of the headrest unit **27** laterally of the tongue member **24** is limited by the engagement of the ball stem member **31** with the side wall surface **43** of the central opening **39** (FIGS. 5, 8 and 10). Such engagement, to limit the fore and aft pivotal movement of the headrest unit **27**, occurs at diametrically opposite portions of the side wall surface **43**.

It is seen, therefore, that on the release of the ball member **29** out of locking engagement with the socket means **32** the headrest unit **27** is easily and quickly manually movable by the chair operator to an adjusted position within defined limits. These defined limits provide adequate and full accessibility to all tooth surfaces to be worked on while providing for patient comfort while the adjustment is taking place. The head member **56** is centrally contoured in its forward side to form a pocket or rest to comfortably receive the back portion of a patient's head. As a result the patient's head is supported for movement concurrently with the head rest unit **27** to an adjusted position.

In the vertical adjustment of the tongue member **24** relative to the chair backrest **17**, the headrest assembly **15** might be accidentally dropped prior to any manipulation of the locking screw **26**. Should this occur, there is provided a rubber bumper **71** on the tongue member at a position spaced downwardly from the lower cup section **33**. The engagement of the bumper **71** with the top surface **23** of the backrest **17** not only eliminates any possible damage to the headrest assembly but prevents the finger of an operator from being caught between the lower cup section **33** and the top surface of the backrest **17**.

Although the invention has been described with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes can be made therein which are within the full intended scope of this invention as defined by the depended clams.

I claim:

1. An adjustable headrest assembly for a dental chair having a backrest with an upright hole open to the top surface of said backrest comprising:

(a) an elongated support member receivable within said hole,

(b) a socket unit mounted on said support member,

(c) a ball member swivelly supported within said socket unit having a radially extended stem member,

(d) a headrest unit secured to said stem member for swivel movement with said ball member,

(e) means on said socket unit for releasably locking said ball member against movement in a swivelly moved position, and

(f) coacting means on said support member and said headrest unit for relatively limiting the swivel movement of said headrest unit in directions transversely and laterally of said support member, and rotatably about the axis of said stem member.

2. The headrest assembly according to claim 1 wherein:

(a) said coacting means includes a pair of transversely opposite outwardly projected stop fingers on said support member, and

(b) said headrest unit includes a base member having a pair of cavities corresponding to said pair of stop fingers positioned at opposite sides of said support member, each finger extended within a corresponding cavity and engageable with certain wall portions of an associated cavity in response to a swivel movement of said headrest unit transversely of said support member or rotatably about the axis of said stem member.

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U.S. Cl. X.R.

297—410