United States Patent

Carnahan

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[54] HEADREST APPARATUS FOR A WHEELCHAIR

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[52] **U.S. Cl.** **297/410,** 128/75, 297/392

[51] **Int. Cl.** **A47c 7/36,** A47c 7/42

[58] **Field of Search** 297/391–393, 408, 297/410; 128/75

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[57] **ABSTRACT**

A wheelchair having rearwardly projecting frame members on which headrest apparatus is adjustably mounted for movements vertically and horizontally to accommodate patients of varying physiques. Mounting apparatus is provided to permit the headrest apparatus to swing in a horizontal plane and includes a swivel, and mechanism for selectively restricting the movement of the swivel.

9 Claims, 5 Drawing Figures

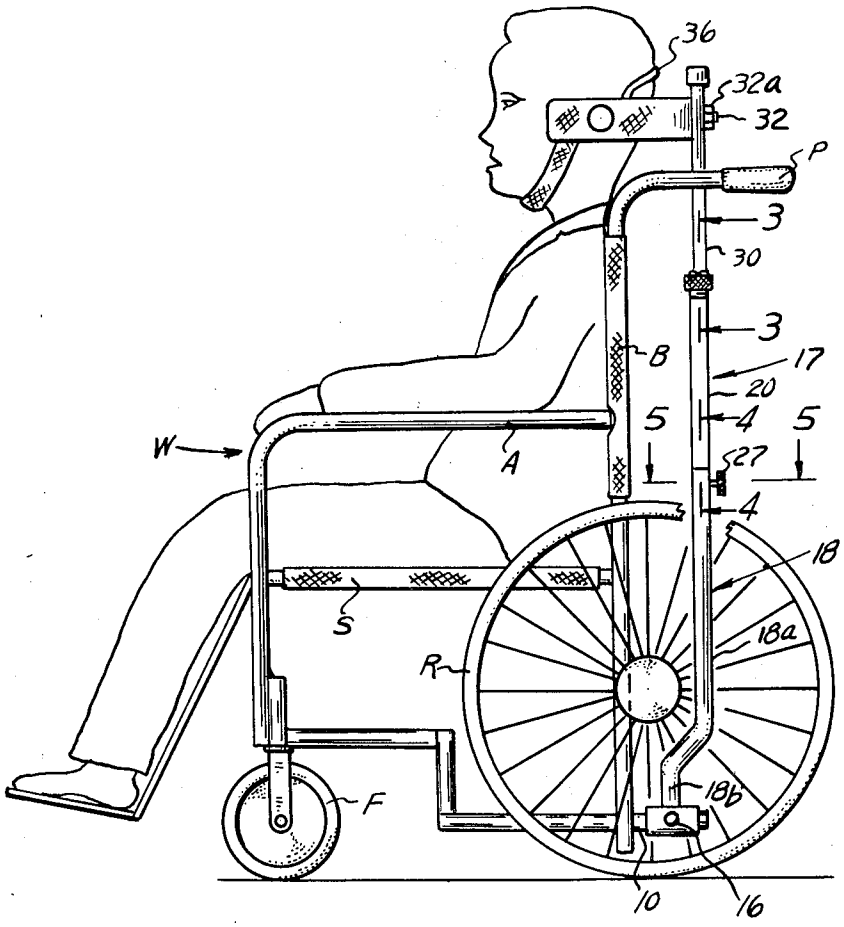


FIG. 1

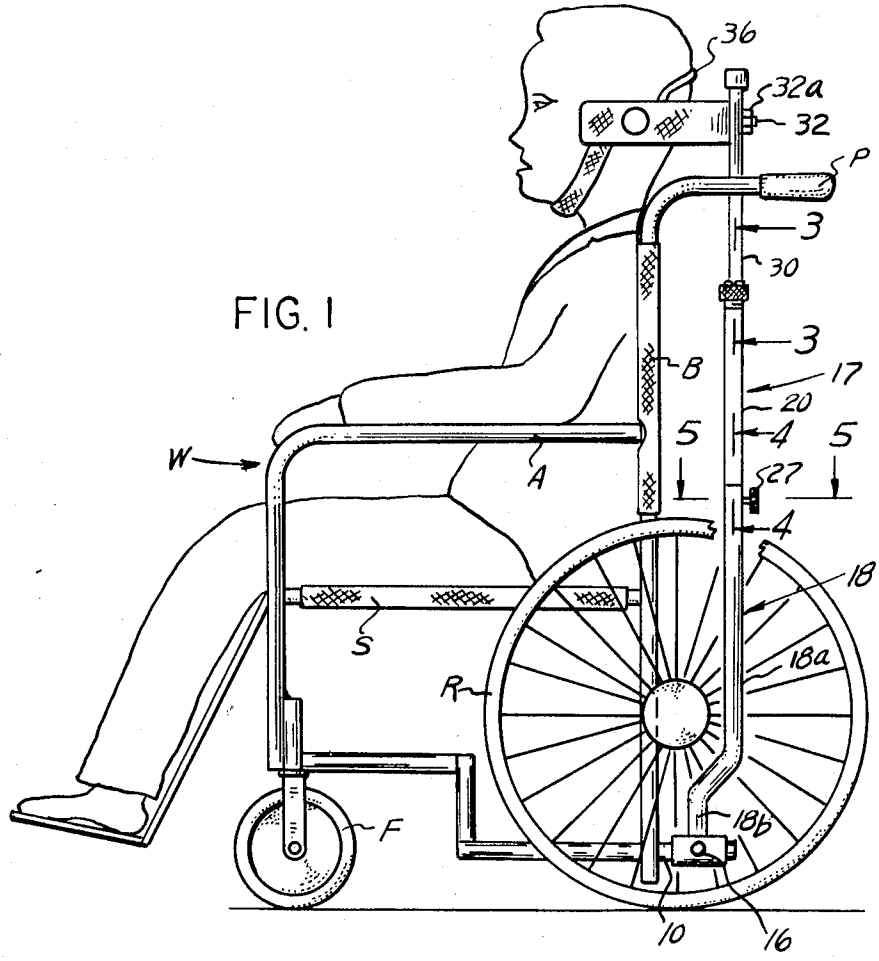
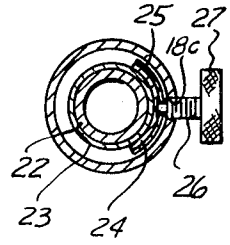


FIG. 5



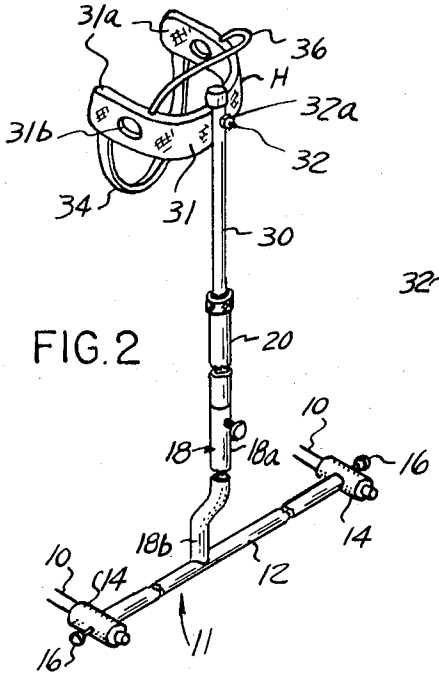


FIG. 2

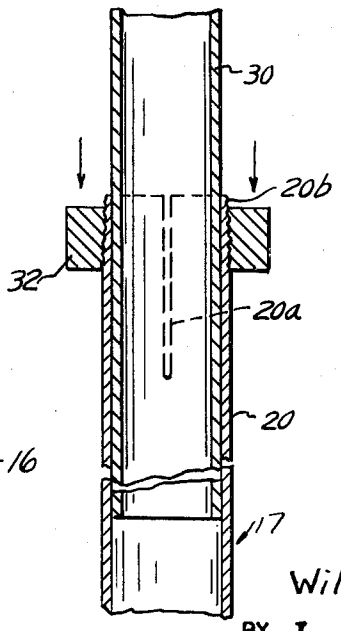
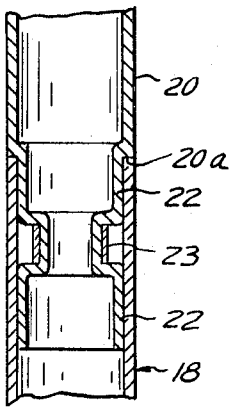


FIG. 3

FIG. 4



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HEADREST APPARATUS FOR A WHEELCHAIR

FIELD OF THE INVENTION

This invention relates to wheelchairs and more particularly to apparatus for supporting the head of a person who is restricted to a wheelchair and who does not have complete muscular control of his upper body. There are many persons who, for various reasons, have lost control of all or a portion of their body muscles. The majority of such persons are unable to sit up unassisted and, consequently, must spend most of their time in bed in the prone position. Continued bed rest frequently results in what is commonly referred to as "bed sores," in addition to patient apathy and mental dejection.

It is known that placing such an afflicted person in a wheelchair and securing him therein so that he may be wheeled about, both his physical and mental condition are improved. Due to the limited muscular control in the neck and head area of such a person, however, he is not able to maintain his head in an upright position except, perhaps, for a very short time. Thus, it is necessary to provide a headrest or support which will support the patient's head when he is being wheeled about but which will permit him to move his head both horizontally and vertically. It has been found that if the headrest is permitted to swing in a horizontal plane, the neck muscles of the patient may be exercised and, in addition, the range of the patient's vision is increased. With patient improvement, it is desirable to provide mechanism which will make it increasingly difficult for the patient to move his head horizontally, thereby gradually strengthening the patient's muscles and improving the muscle tone.

DESCRIPTION OF THE PRIOR ART

Although prior art devices have been provided in the past for supporting a person's head, there have been no provisions for adjustably mounting such devices on a wheelchair for movement forwardly, rearwardly, and vertically to accommodate patients who have different physiques. Moreover, the known prior art devices of this general type use a suspended swivel, which is positioned above, and generally in concentric alignment with, the axis of the person's upper spine so that any horizontal movement of the head necessarily results in vertical movement of the head, thereby limiting the person's freedom of movement. There also has been no provision in the prior art devices for locking a headrest support in various horizontally disposed positions, nor has there been provided any mechanism for selectively increasing the resistance to movement of the head support to assist the user in strengthening his neck muscles.

OBJECTS AND SUMMARY

It is an object of the present invention to provide a wheelchair having a headrest movably supported thereon for movement forwardly, rearwardly and vertically to accommodate patients of varying sizes.

Another object of the invention is to provide a rotatable headrest which is supported on a swivel that permits the headrest to swing in a horizontal plane.

A further object of the invention is to provide a swingable headrest support on a wheelchair which will assist a user in improving his neck muscles by making it increasingly difficult to swing the headrest support.

Another object of the invention is to provide a horizontally movable headrest support on a wheelchair and which is lockable in a plurality of horizontal positions.

Briefly, there is provided in accordance with the present invention a wheelchair having a head support mounted on the rearward end thereof by swivel means which permits the head support to swing in a horizontal plane. Mechanism is provided for selectively varying the resistance to movement of the swivel means and for locking the head support in any one of a plurality of horizontally disposed positions.

Other objects and advantages will become apparent from the following description when considered in relation to the accompanying drawings in which:

FIG. 1 is a side elevational view of a wheelchair having headrest apparatus mounted thereon according to the invention;

FIG. 2 is a fragmentary perspective view of the headrest apparatus mounted on the rearwardly extending frame members of the wheelchair;

FIG. 3 is a fragmentary, enlarged, vertical sectional view taken on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged, vertical sectional view of another portion of the support means taken on the line 4—4 of FIG. 1; and

FIG. 5 is an enlarged, fragmentary sectional plan view taken on the line 5—5 of FIG. 1.

Apparatus constructed according to the invention is adapted for use with a conventional wheelchair W having a seat S, a backrest B, a pair of sidearms A, and pairs of front and rear wheels F and R mounted on opposite sides of the chair. The upper portion of the backrest terminates in a pair of spaced apart handles P. Extending along the underside of the wheelchair in the usual manner is a pair of laterally spaced apart frame members **10** which project rearwardly of the rear end of the seat S.

The support apparatus of the present invention is designated generally by the reference character **11** and includes a crossmember or crossbar **12** having coupling or mounting members **14** at its terminal ends which are slidably received on the rearwardly extending frame members **10**. Each of the coupling members **14** threadedly receives a radially adjustable anchor screw **16** which can be adjusted radially to clamp and unclamp the members **14** to and from the member **10**. When the members **14** are unclamped from the member **10**, the apparatus **11** may be adjusted forwardly and rearwardly of the chair.

Extending upwardly from the midportion of the bar **12** is an upright support **17** having a lower, tubular section **18**. The upper portion **18*a*** of the tubular section **18** is offset slightly rearwardly relative to the lower portion **18*b*** to enable the section **18*a*** to be positioned a greater distance rearwardly of the back rest B. Rotatably mounted atop the upper end of the tubular section **18** is a second tubular section **20** formed with an inwardly turned, load bearing flange portion **20*a*** in engagement with the terminal end of the tubular section **18** and a tubular terminal end portion **22** received within the upper portion of the tubular section **18**. Concentric with and secured to a reduced diameter portion **22*a*** of terminal end portion **22** is a case hardened metal ring **23** which is resistant to wear. Disposed between the wear ring **23** and the inner surface of the tubular section **18** is a friction member **24** which may be formed from any commercially available brake lining material. The friction member **24** may be bonded or otherwise suitably secured to a backing plate **25** which rotatably receives the terminal end portion of an adjusting screw **26** threadedly received within a threaded aperture **18*c*** formed in the wall of the tubular section **18**. The plate **25** is secured to the terminal end portion of the screw **26** so as to follow the radial movements of the screw **26**. A manually operable knob **27** is provided on the screw **26** to facilitate turning of the latter in the opening **18*c***. Turning the knob **27** so as to move the screw **26** radially inwardly increases the pressure of the brake lining material **24** against the wear ring **23**, thereby increasing the resistance to movement of the tubular section **20** relative to the tubular section **18**.

At its upper end the section **20** telescopically receives the lower end of a tubular section **30** which has an external diameter slightly less than that of the tubular section **20** to permit the sections **20** and **30** to slide vertically, relative to each other. To lock the member **30** in place, the upper threaded portion **20*b*** of the member **20** is provided with vertically extending grooves **20*b*** which permit the upper portion of the tubular section **20** to contract radially and grip the section **30** when a nut **32**, which has a slightly smaller internal diameter than the outer diameter of portion **20*b***, is threaded onto the threaded portion **20*b***. To adjust the vertical position of the section **30**, the nut **32** is unthreaded, the section **30** is moved relatively to the section **20** and the nut **32** then replaced to

force the upper portion **20***b* of the tubular section **20** into engagement with the tubular section **30**. The tubular sections **18**, **20** and **30** may be formed of steel or aluminum.

Mounted on the upper portion of the tubular member **30** is a headrest or support member, generally designated H, including a generally U-shaped horizontally disposed member **31** having its base connected to the tubular section **30** with a bolt **32** and a nut **32***a*. The legs **31***a* of the U-shaped headrest are adapted to extend along opposite sides of the patient's head, as shown in FIG. **1**, and include apertures **31***b* therein in the area normally occupied by the patient's ear. Extending downwardly from the forward portion of the legs **31***a* of the U-shaped member is a generally U-shaped chin strap **34** on which the chin of the user is adapted to be supported. Extending upwardly along the rearward portion of the legs **31***b* is another U-shaped member **36** which serves as a rest for the back of the head. The portions **31**, **34** and **36** of the head support H may comprise individual sections of tubular material secured together with suitable fastening means and wrapped in resilient material which has a wear-resistant covering thereover.

The head support H is adjusted vertically to a particular patient by adjusting the tube **30** relatively to the tube **20** so that the chin strap **34** is slightly below the normal position of the user's chin, thus enabling the user to exercise his neck muscles in a vertical direction by raising his head off the chin strap **34**. The chin strap **34** would be used as a rest in the event the patient's neck muscles tire. The tubular members **18**, **20**, and **22** cooperate to define a swivel on which the head support H is pivotally movable in a horizontal plane about the longitudinal axis of the tubular members **18**, **20** and **30**.

In operation, the patient is seated in the wheelchair W and straps, not shown, are used about the waist and shoulders to strap the patient into the chair. The head support member H is adjusted vertically, by unscrewing the member **32** and adjusting the tube **30** relatively to the tube **20** before again replacing the nut **32**. The head support H is adjusted forwardly or rearwardly as necessary by unscrewing the screws **16**, moving the bar **12** forwardly or rearwardly depending upon the size of the patient, and then tightening the screws **16**. If the user's strength is such that he is able to keep his head raised for a sustained period of time, and he is able to move the head support H in a horizontal plane with ease, the screw **27** may be turned inwardly to increase the force with which the brake lining material **24** engages the wear strip **23**, thereby impeding the movement of the tube **20** relative to the tube **18**. The increased resistance to movement thereby increases the effort which the patient must exert to turn the headrest support H, thereby strengthening the patient's neck muscles.

If it is desired to fix the head support H in any selected position about the longitudinal axis of the member **30**, the support H may be moved to the desired position and the member **27** may be turned inwardly an amount sufficient to force the members **23** and **24** into locked engagement to prevent any further movement of the head support in the horizontal plane.

Since it is obvious that changes and modifications can be made in the above described details without departing from the nature and spirit of the invention, it is to be understood that the invention is not limited to the details except as set forth in the appended claims.

I claim:

1. In combination: a wheelchair having
a seat;
a backrest,
a rearward end, and
generally horizontally extending frame members projecting rearwardly from opposite sides of said rearward end; and
therapeutic apparatus adapted for use with a patient seated in the wheelchair for supporting a patient's head including;
upstanding support means rearwardly of said backrest;
head support means on said upstanding support means adjacent the upper end thereof and extending forwardly of said backrest and said support means;
said upstanding support means including swivel means mounting said head support means for movement in a horizontal plane only;
means mounting said upstanding support means on said frame members for forward and rearward movement to adjust the position of said head support means relatively to said wheelchair; and
means for securing said mounting means in a selected position of adjustment on said frame members.

2. The combination of claim **1** wherein said upstanding support means includes an upright support post along the rearward end of said wheelchair, and said swivel means is generally in alignment with said post.

3. The combination of claim **1** wherein said upstanding support means includes a generally vertically extending post and a transversely extending member at the lower end of said post, and wherein said mounting means includes means on opposite ends of said transversely extending member received by said rearwardly projecting frame members for releasably clamping said transversely extending member to said rearwardly projecting frame members.

4. The combination of claim **1** including adjustable resistance means for selectively resisting movement of said swivel means, and means for adjusting said resistance means to vary the force required to move said head supporting means in said horizontal plane.

5. The combination of claim **1** wherein said upstanding support means includes a plurality of relatively rotatable tubular sections having telescoping portions; said head supporting means being mounted on one of said tubular sections for movement in a horizontal plane; and cooperating means on said telescoping portions for selectively adjusting the resistance to rotation of one tubular section relative to another.

6. The combination of claim **5** wherein said tubular sections are circular in cross section; one of said tubular sections including a reduced diameter tubular end portion coaxially fitted within an end portion of the adjacent tubular section; said cooperating means comprises a radially adjustable circumferentially extending braking strip disposed between the coaxially fitted portions of said tubular sections; and means for adjusting the radial position of said braking strip.

7. In combination with a wheelchair, a therapeutic headrest support adapted for use with a patient seated in the wheelchair comprising:
generally upright, elongate support means mounted on said wheelchair rearwardly of its seat;
head support means extending forwardly of said upright support means and over said seat for supporting a patient's head; and
swivel means mounting said head support means on said upright support means for rotary movement in a substantially horizontal plane and about an axis corresponding to the longitudinal axis of said upright support means.

8. The combination of claim **7** including means for locking said head support in a selected one of a plurality of positions in said horizontal plane.

9. The combination of claim **7** wherein said wheelchair includes frame members extending rearwardly thereof; and means mounting said upright support means on said frame members for movement forwardly and rearwardly thereof.

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