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H. R. PIETSCHMANN
LONGITUDINALLY ADJUSTABLE BACK-REST FOR DENTAL
CHAIR AND THE LIKE

3,554,599

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2 Sheets-Sheet 1

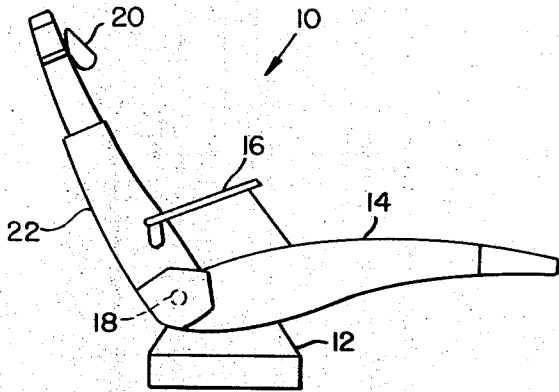


FIG. 1

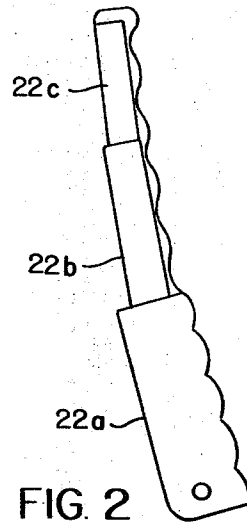


FIG. 2

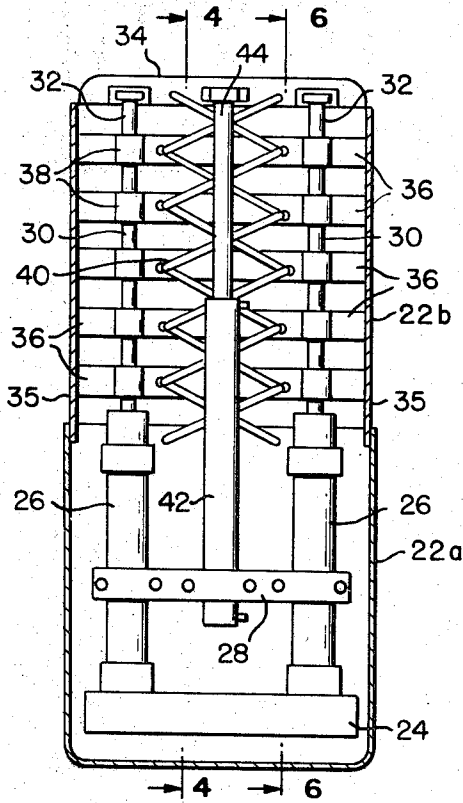


FIG. 3

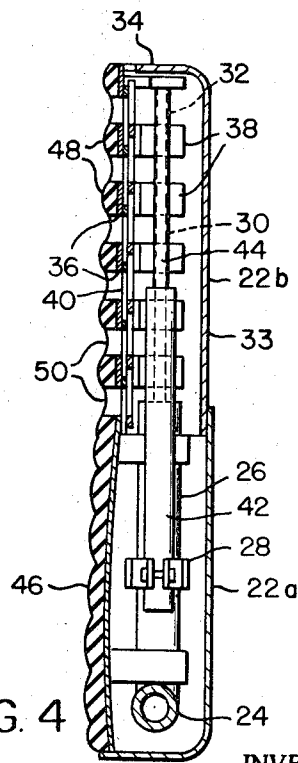


FIG. 4

INVENTOR
HELMUT RICHARD PIETSCHMANN

BY *Theodore B. Roedel*

ATTORNEY

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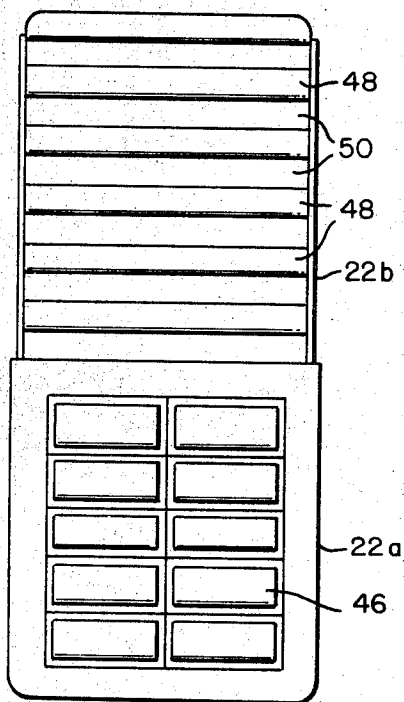


FIG. 5

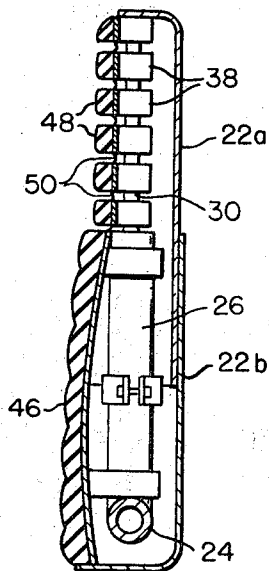


FIG. 6

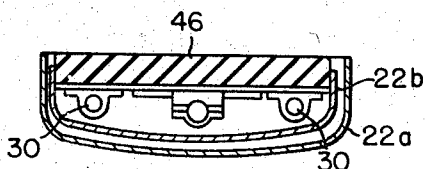


FIG. 7

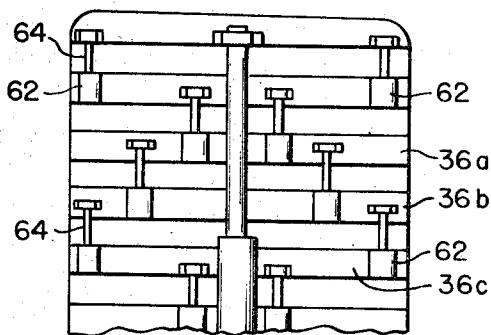


FIG. 9

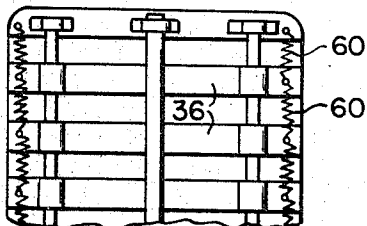


FIG. 8

INVENTOR
HELMUT RICHARD PIETSCHMANN

BY *Theodore B. Roedel*

ATTORNEY

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3,554,599

LONGITUDINALLY ADJUSTABLE BACK-REST FOR DENTAL CHAIR AND THE LIKE

Helmut Richard Pietschmann, Karlsruhe, Germany, assignor to Sybron Corporation, Rochester, N.Y., a corporation of New York

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5 Claims 10

ABSTRACT OF THE DISCLOSURE

A longitudinally adjustable back-rest for dental chairs and the like having a fixed section and a telescoping section, the telescoping section having a plurality of spaced transverse supporting members covered with upholstery, the sections moving together and apart as the sections are telescoped together and apart respectively to permit increasing or decreasing the length of the back-rest for accommodating patients of various heights.

BACKGROUND OF THE INVENTION

The present invention relates to a back-rest for dental chairs or the like and more specifically to a telescoping back-rest which can be longitudinally adjusted to accommodate patients of various heights.

In the use of dental chairs or for that matter any medical examining or operating chair, it is necessary to adjust the back-rest to various positions so that the dentist or treating person will be able to place the patient's head in any desired position. At the same time, it is necessary that the back-rest permit the treating person to position himself as close to the spot to be treated as possible. In particular, when the treating person is performing his work while sitting, there must be sufficient space provided for his legs which are most frequently placed below the back-rest.

In order to meet these requirements, chairs of various kinds have been created. For example, besides chairs in which the back-rest can be tilted or reclined with respect to the seat portion of the chair, chairs have also been provided with back-rests which shift as a unit on the axis of the back to accommodate patients of various heights. Back-rests are also known which use removable sections to adapt the back of the chair to the patient's height. In this respect, one or more sections are added or removed depending on the height of the patient.

Some chairs are constructed with a relatively short back-rest portion. This short back-rest is then provided with a head rest which is used as the adjustable element to adapt the back rest to accommodate patients of various heights.

There are disadvantages inherent in all these prior art constructions. For example, if the back-rest is constructed to shift as a unit, the back-rest may prevent the treating person, who is performing his work while sitting, from extending his legs below the back-rest. This is particularly true in cases where the back-rest, constructed to support even the tallest patient, is shifted downward to accommodate a small patient or child. On the other hand, adjustable head-rests which provide adequate support for the small patient or child provides only two points of support for the relatively tall person. In this respect, a tall patient undergoing extensive treatment will experience unpleasant pressure reactions caused by the unfavorable distribution of his weight on the support offered by the head rest and the relatively small back-rest.

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SUMMARY OF THE INVENTION

The present invention can be characterized in one aspect thereof by the provision of a back-rest for dental chairs and the like which can be longitudinally adjusted, the back-rest comprising a telescoping housing containing a plurality of spaced transverse supporting parts which are shiftably fixed together wherein the upholstery of the chair bridges both the transverse supporting parts and the spaces therebetween.

OBJECTS OF THE INVENTION

It is the primary object of the present invention to provide a longitudinally adjustable back-rest for dental chairs and the like.

Another object of the present invention is to provide a back-rest for dental chairs and the like having a telescoping housing which can be adjusted to fully support either very tall or very short patients seated in the chair.

A further object of the present invention is to provide a back-rest for dental chairs and the like having a plurality of spaced transverse sections each section being movable with respect to another to increase or decrease the length of the back-rest.

These and other objects, advantages and characterizing features of the present invention will become more apparent on consideration of the following detailed description thereof when taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation view of a dental chair or the like employing the back-rest of my invention;

FIG. 2 is a view of the back-rest of my invention having three telescoping sections;

FIG. 3 is a rear-view of the back-rest of my invention extended to its full length wherein the rear covering panels have been removed for clarity;

FIG. 4 is a view taken along lines 4—4 of FIG. 3;

FIG. 5 is a front view of the back-rest of my invention extended to its full length showing the disposition of the chair upholstery;

FIG. 6 is a view taken along lines 6—6 of FIG. 3, only showing the back-rest telescoped to its shortest length for accommodating a small patient or child;

FIG. 7 is a top view of the back-rest of my invention with the upper covering removed for purposes of clarity;

FIG. 8 is a view of a back-rest portion showing another embodiment of my invention; and

FIG. 9 is an enlarged view of a back-rest portion showing still another embodiment of my invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, FIG. 1 shows in simplified form a dental chair or the like, it being understood that while reference is specifically made to dental chairs, the present invention is also applicable to any medical examination or operation chair.

The chair generally designated 10 consists of a lower or base portion 12, a seat and leg support 14, arm-rest 16, pivot 18, head-rest 20 and back-rest 22 of the present invention.

Referring to FIG. 2, one embodiment of back-rest 22 is shown to consist of three telescoping sections 22a, 22b and 22c wherein section 22a is a fixed section for receiving the movable sections 22b and 22c. Longitudinal adjustment of these telescoping sections can be effectuated by means set out hereinbelow contained within the housing.

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Referring to FIG. 3, back-rest 22, for purposes of illustration is shown to include only one movable telescoping section 22b whereas it is within the skill of the art to construct a housing having two or more movable sections as shown in FIG. 2. The back-rest in FIG. 3 is connected with base 12, of the dental chair by a pivot member 24 which forms part of pivot 18 (FIG. 1). The tilting movement of the back-rest is realized via this pivot connection.

Connected to pivot member 24, is a pair of cylinders 26, which are maintained in a spaced relationship by a transverse support member 28. A guide rod 30 is slidably disposed in each cylinder, each guide rod having its end 32, fixed to the upper end panel 34 of telescoping housing section 22b.

Referring to FIGS. 3 and 4 rear, side and upper end panels 33, 35 and 34 respectively of telescoping section 22b form an open frame, the opening being spanned by a plurality of transverse supporting sections 36 which are slidably connected to guide rods 30 by bushings 38. In order to insure a uniform spacing between transverse supporting sections 36 as the length of the back-rest is increased or decreased, the transverse sections are interconnected by a scissor-linkage 40, which scissors open to move the transverse supporting sections uniformly apart as the housing is telescoped open and which scissors close to move the transverse sections uniformly together as the telescoping sections close. Any suitable means such as a hydraulic cylinder and ram, 42 and 44 respectively, having one end fixed to support member 28 and another end fixed to housing end 34 can be used to open or close the telescoping housing sections.

Referring to FIGS. 4 and 5, the upholstery which covers the fixed back-rest section 22a is shown to include a single pad member 46, whereas the movable telescoping section 22b is upholstered with a series of transverse pads 48 attached to the transverse supporting sections 36. A web 50 is provided between adjacent pads 48 to span the space between transverse supporting sections 36. Accordingly, when telescoping section 22b is moved to increase the length of the back-rest as shown, for example, in FIG. 4, the gap between the spaced apart upholstery pads 48 is spanned by web 50. On the other hand, when telescoping section 22b is moved to decrease the length of the back-rest, as shown for example in FIG. 6, webs 50 fold into the gap between adjacent upholstery pads 48 as the gap becomes narrower.

OPERATION

To increase the length of the back-rest section shown in FIGS. 3 and 4, sections 22a and 22b are telescoped apart by any suitable means such as hydraulic cylinder and ram, 42 and 44 respectively, which acts to move back-rest section 22b with respect to the fixed section 22a. Since guide rods 30 are connected at one end 32 to the upper end panel 34 of the back-rest, increasing the length of the back-rest causes the guide rods to be withdrawn from cylinders 26. Scissors linkage 40 also having one end attached to upper end panel 34 of the housing, opens causing transverse supporting sections 36 to move apart, the transverse sections being guided in their movement by the actions of bushings 38 sliding over guide rods 30. As transverse sections 36 are moved apart, upholstery webs 50 are unfolded from between upholstery pads 46 to span the gap created between the upholstery pads by the shifting apart separating sections.

In another embodiment of the invention as shown in FIG. 8, a uniform spacing between transverse sections 36 is maintained by connecting adjacent sections with coil springs 60 of the same length and strength. In still another embodiment of the invention, as shown in FIG. 9, adjacent transverse sections 36 are connected by separate cylinder and guide rods 62 and 64 respectively. In this embodiment, the gap between adjacent transverse sections does not vary uniformly as the length of the back-rest

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is increased or decreased. In this respect, each succeeding transverse section, such as 36c, is pulled into position by the preceding transverse section such as 36b. In this manner, each transverse section is pulled upward one after the other by the preceding transverse section as the length of the back-rest is increased.

Accordingly, it would be appreciated that the present invention accomplishes its attended objects in providing a longitudinally adjustable back-rest for dental chairs and the like which can be quickly and easily adjusted to accommodate patients of various heights.

Having thus described the invention in detail what is claimed as new is:

1. A longitudinally adjustable backrest for dental chairs or the like comprising:

- (a) a fixed section;
- (b) a movable frame telescoping with said fixed section said frame having an open front portion;
- (c) a plurality of spaced support members transverse the open portion of said frame substantially normal to the longitudinal axis thereof, one of said support members being movable with respect to another to increase or decrease the relative spacing therebetween as said movable frame telescopes with said fixed section;
- (d) a plurality of upholstery pads each fixed to one of said support members; and
- (e) a flexible web extending between adjacent support members

- (i) said web being folded between said adjacent support members when said frame and fixed section are telescoped together whereby said folded web is concealed and said upholstery pads form a substantially continuous surface covering the open portion of said frame and
- (ii) said web being unfolded to an exposed position spanning the space between adjacent support members when said frame and fixed section are telescoped apart whereby said upholstery pads and unfolded web together form a substantially continuous surface covering the open portion of said frame.

2. A longitudinally adjustable backrest as set forth in claim 1 comprising:

- (a) a guide rod in said frame at each side thereof, one end of each rod being fixed to the top of said frame;
- (b) said support members each being slidably attached adjacent their ends to said guide rods;
- (c) receiving means in said fixed section telescoping with said guide rods; and
- (d) means interconnecting said support members for sliding one of said members relative to another on said guide rods as said fixed section telescopes with said frame and said guide rods telescope with said receiving means.

3. A longitudinally adjustable backrest as set forth in claim 2 wherein said means interconnecting said support members is a scissor linkage for moving said members apart or together as said frame and fixed sections telescope.

4. A longitudinally adjustable backrest as set forth in claim 1 comprising:

- (a) a rod having one end fixed to a first of said support members and a second end;
- (b) a cylinder on a second of said support members retaining and telescoping with the second end of said rod; and
- (c) said first support member being movable with said frame to pull said rod first partly from said cylinder for increasing the spacing between said first and second support members and thereafter to pull said second support member along with said first support member, whereby said support members are moved apart in succession one after another as said frame and fixed section are telescoped apart,

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5. A longitudinally adjustable backrest for dental chairs and the like comprising:

- (a) a fixed section having a padding of upholstery material fixed thereon;
- (b) a movable frame telescoping with said fixed section, said frame having a top, rear and side panels and an open front;
- (c) a guide rod at each side of said frame, one end of each rod being fixed to said top panel;
- (d) receiving means in said fixed section telescoping with said rods as said movable frame and fixed section telescope;
- (e) a plurality of horizontal support members extending across the open front of said frame, the ends of said support members being slidably carried by said guide rods;
- (f) drive means operatively connected between said fixed section and frame for telescoping said frame with said fixed section;
- (g) means interconnecting said support members for increasing or decreasing the spacing between said support members as said frame and fixed sections telescope; and
- (h) upholstery means carried by each support member and fixed at its ends to said top panel and fixed section, said upholstery means including
 - (i) a pad on each support member and

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- (ii) a web portion said web portion being folded into the space between adjacent support members when said frame and fixed sections are telescoped together and unfolded to span the space between adjacent support members when said frame and fixed sections are telescoped apart whereby said upholstery pad on said fixed section and said upholstery means together provide a substantially continuous support surface regardless of the longitudinal adjustment of said backrest.

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FRANCIS K. ZUGEL, Primary Examiner

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