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DENTIST'S STOOL OR THE LIKE
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#### Abstract

OF THE DISCLOSURE Briefly this invention provides a stool which includes a seat and an L-shaped rest carrier having a horizontal portion and an upright portion mounted on said stool. The first end of the L-shaped rest carrier is subjacent the central portion of the seat and its second end above and outboard of said seat. An arcuate rest is mounted adjacent one of its ends on said rest carrier adjacent the second end thereof. The arcuate rest is supported by the rest carrier in substantially horizontal position and higher than the seat, the upright portion of the rest carrier being swingable about the axis of the horizontal portion to carry the rest in a direction transverse of the horizontal portion of the rest carrier while supporting the rest in substantially unaltered attitude to the horizontal. The stool of this invention may also embody other features.


This invention relates to seating structures and more particularly to stools useful for conventionally and specially supporting the user.

An object of this invention is to provide for persons such as dentists and dental assistants whose work requires that they at times sit in normal upright and at other times in fatiguing leaning positions for extended periods, a stool having a rest which the user may use to effectively and comfortably support his back, abdomen, and arms to minimize fatigue.

Another object of this invention is to provide a stool of the above character and compatible with the varied body characteristics and activities of users while seated on the stool.

A further object of this invention is to provide a stool of the above character having pleasing appearance and which is easily adjustable to and lockable in adjusted position as desired.

A further object of this invention is to provide a stool of the above character which is durable, convenient, and easy to use.

A further object of this invention is to provide a chair or stool having a seat, an arcuate, horizontally positionable rest mounted on a plarality of uprights swingable annularly of the periphery of the seat and each tiltable about a respective one of a plurality of horizontal parallel axes to reposition the rest and a wedge brace pivoted to one upright, clampable to the other, and tending to be wedged tighter under forces resulting from supporting cooperation of the rest with a user.

A further object of this invention is to provide a chairstool of the above character, of which the uprights may be individually adjusted in length to position the rest in a tilted attitude into which it pivots about an axis parallel to the axis of tilting of the uprights.

A further object of this invention is to provide a chairstool of the above character in which the seat and the rest are freely rotatable or swivelable relative to each other about a common vertical axis.

The above and other features and objects of the invention will in part be obvious and in part be apparent to those having ordinary skill in the art to which this invention pertains, from the following detailed description and the accompanying drawing of what presently appears to be a preferred embodiment of the instant invention.

In the drawings:
FIG. 1 is a view in vertical elevation, partly in sectioni of a stool embodying the instant invention;

FIG. 2 is a view in vertical elevation of the device 5 shown in FIG. 1 when viewed from the right, that is, from the position in which FIG. 2 is shown in relation to FIG. 1, portions of the device being broken away in FIG. 2 and adjusted positions of portions thereof being shown in dot-dash lines;

FIG. 3 is a top plan view of the device shown in FIG. 1 a portion thereof being broken away and positions to which portions thereof are adjustable being shown in dotdash lines;

FIG. 4 is a fragmentary view in vertical section of 15 portions of the device shown in FIG. 1 and illustrating details of construction thereof;

FIG. 5 is a fragmentary view in section showing the wedge brace and other portions of the device of FIG. 1;

FIG. 6 is a fragmentary view in section of a portion of
FIG. 7 is a fragmentary schematic view of the rest and several associated parts of the device of FIG. 1; and,

FIG. 8 is a fragmentary view in side elevation of a portion of the device of FIG. 1, but on a larger scale than 25 FIG. 1.

In the drawings and in the following description, like reference characters indicate like parts.

In the accompanying drawings a device 14 which is a seating device particularly useful to dentists and dental 30 assistants, is shown as an illustrative embodiment which presently appears to be a preferred embodiment of the instant invention.

In the drawings, the stool 14 has a base 15 , from the hollow central portion 18 of which four integral arms 16 35 extend radially outwardly, and each is equipped adjacent its outer end with a caster wheel 17. A hollow column 20 extends upwardly from its lower or root portion 21 to an enlarged terminal upper portion 22. The portion 21 of column 20 may be secured in fixed relation to the central portion 18 of the base by set screw 19.

A stem 25 extends downwardly through an aperture 24 in column cap 23 , into the hollow interior of column 20 adjacent surface 27 on the interior of the upper portion 22 of the column. A clamp shoe 28 is provided adjacent stem 25 and on the opposite side thereof from support surface 27. Clamp screw 29 has its shank in threaded engagement with upper portion 22 and may be appropriately rotated to advance farther into or out of upper terminal portion 22. By appropriately advancing screw 29 toward stem 25, clamp shoe 28 is advanced toward surface 27 and between them stem 25 may be securely clamped. Column cap 23 disposed annularly of stem 25 , covers the upper end of the column.

Adjacent the lower end of stem 25 is a stop member 26 which may be an integral annular shoulder or a retaining ring of which a portion is received in an annular groove provided in stem 25 . The upper portion 30 of stem 25 is of reduced diameter, and the boss 31 of seat bracket $\mathbf{3 2}$ is disposed annularly of portion 30 with its 60 lower radial face 33 abutting radial face 34 of stem 25. As shown in FIG. 4, section 30 of stem 25 terminates just below the upper surface of seat bracket plate portion 32 which is spaced radially therefrom to provide a recess for applying a retaining ring 35 which cooperates 65 with annular groove 36 in portion 30 and also cooperates with an upwardly facing radial face 37 of the seat bracket 32.

As shown in FIGS. 1, 2, and 3, a round cushioned seat 38 is mounted on seat bracket 32 by suitable fastening 70 means such as screws or the like, not shown.

Seat 38 is thus free to rotate with seat bracket 32 and integral boss portion thereof 31 on stem portion 30, about
the axis of stem 25 while the latter is clamped against rotation and in fixed relation to the column 20 by the clamp screw 29 and clamp shoe 28 . The height of seat 38 may be adjusted by backing off clamp screw 29 to release stem 25 for axial movement relative to column 20 and when positioned at a height as desired, clamp screw 29 is tightened to lock stem 25 and column 20 in the selected relation.

A carrier bracket 39 has an integral collar portion 40 mounted in annular relation to boss portion 31 of the seat bracket 32 with an upper radial face 41 adjacent an op posed radial face 42 on the seat bracket 32 and a lower radial face 43 engaging retaining ring 44 , a portion of which ring is received in an annular groove provided in the external face of boss 31. Thus, carrier bracket 39 is mounted for swivelling or swinging movement relative to seat $\mathbf{3 8}$ and to stem $\mathbf{2 5}$ about the axis of stem 25 which is also the axis of rotation of seat 38 , either alone or in unison with seat 38 or not in unison with seat 38

Integral with the carrier bracket collar portion 40, is a bracket portion 45 through which two parallel, substantially horizontal bores $\mathbf{5 2}$ extend as shown in dash lines in FIG. 3. A respective slot 46 is provided in the wall of each bore between pairs of lugs 47, 48. Screws or bolts 49 extend through respective bores of lugs 47, 48 and cooperate with a respective nut 50 in a manner that the bracket portion 45 may be utilized in the manner of a split clamp, as will hereinafter be described.

A pair of stub shaft members $\mathbf{5 1}$ is provided, each having a portion thereof intermediate its ends received in a respective one of said bores $\mathbf{5 2}$. A pair of spaced annular grooves 53,54 are provided in each shaft 51 . A retaining ring $\mathbf{5 5}$ has a portion thereof received in groove $\mathbf{5 3}$ with the remainder thereof projecting to form a retaining shoulder adjacent the face of bracket portion 45 adjacent collar portion 40 and annularly of the bore 52 through which the cooperating stub shaft 51 extends. Retaining ring 56 also cooperates with stub shaft 51 , a portion thereof being received in groove 54 therein and the remainder thereof projecting outwardly to serve as a stop collar. As shown in detail in FIG. 8, the retaining rings $\mathbf{5 5 , 5 6}$ are preferably spaced far enough apart as to allow provision of spacing bearing collars $\mathbf{5 5}^{\prime}$ and $\mathbf{5 6}^{\prime}$ annularly of the stub shaft 51 and respectively intermediate ring 55 and bracket portion 45 and ring 56 and bracket portion 45. By selecting collars $55^{\prime}$ and $\mathbf{5 6}^{\prime}$ of appropriate total accumulative axial lengths, axial shifting of the stub shaft 51 within the bore $\mathbf{5 2}$ can be limited to such amount as may be desired, or if desired, substantially eliminated. The portion 58 of stub shaft $\mathbf{5 1}$ has foot portion 59 of an L-shaped hollow member 60 secured annularly thereof so that the L-shaped hollow member 60 has a unitary relation to the respective stub shaft 51 for unison movement therewith. The leg portion $\mathbf{6 1}$ of the member 60 extends radially from the axis of rotation of stub shaft $\mathbf{5 1}$ in bores $\mathbf{5 2}$ of bracket portion 45. As shown in full lines in FIGS. 1, 2, 3, and 4, the leg portions 61 are in vertical position, and upon rotation of stub shaft 51, the legs 61 swing about the horizontal axes of the stub shafts. The screws 49 and nuts 50 may be manipulated to draw the bracket portion $\mathbf{4 5}$ against each shaft 51 to apply frictional drag of a magnitude as desired to each stub shaft 51 such that leg portion 61 may be swung about the axis of shaft 51 as desired, but the assembly is held against such swinging in the absence of application of positive force applied by an operator or user of the chair desiring to move same.

An extension member 63 is received in telescoping relation to leg portion 61. Indexing recesses 64 are provided in extension member 63, as shown particularly in FIGS. 1 and 4, and the relative telescoped position of extension member 63 to leg portion 61 is fixed by a coupling member 65 which may be a screw, spring-biased pin or the like. As shown in FIG. 4, the extension member 63 is in its lowermost position, that is, advanced into leg 61
to the greatest extent contemplated and the coupling member 65 extends through an aperture in the wall of leg portion 61 into an indexing recess 64 .

An arcuate rest member 66 is mounted on plate 67 by means of screw bolts 68 (FIG. 6) which cooperates with threaded nut-like fastening members 69 embedded in the frame 70 of rest member 66 . A pair of post bolts 71 is provided in threaded relation to integral nut portions 62 of plate 67 and from the plate extend outwardly through a flanged spacing bearing collar 72 to a head portion 73 . The collar 72 extends through an aperture provided in extension member 63 adjacent the upper end thereof, and, intermediate the head 73 of the post bolt 71 and the outer radial end face 74 of bearing collar 72, a wedge brace 75 is mounted for pivoting about the post bolt 71.

The reference characters $60^{\prime}, 61^{\prime}, 63^{\prime}, 64^{\prime}, 65^{\prime}$ and $71^{\prime}$ designate elements similar to those previously described and having corresponding unprimed reference characters

The L-shaped hollow member 60 ' is mounted in the same manner as element 60 and has a telescopable extension member $63^{\prime}$ which may be secured in a fixed position of extension by coupling member $65^{\prime}$. Extension member $63^{\prime}$ is also secured to plate 67 by a post bolt $71^{\prime}$ in a manner similar to that in which post bolt 71 secures extension member 63 to plate 67. However, there is no wedge brace member 75 mounted upon post bolt 71 ', as is apparent from FIG. 2 in particular.

A screw bolt 76 extends through extension member 63', as shown particularly in FIG. 5, and has its head arranged to cooperate with 63' so as to secure the bolt '76 against rotation relative to extension member 63'. As shown in FIG. 5, this may be accomplished by providing the head 77 of bolt 76 with a saddle-shaped surface which lies in face-to-face contacting relation with the surface of members 63'. As shown in detail in FIG. 5 the shank of bolt 76 from head 77 extends successively through extension member 63', slot 78 in wedge brace 75 , crown washer 79 and into threaded engagement with hand nut 80. Annularly of the shank of bolt 76, a flattened surface 81 is provided on extension member $63^{\prime}$ such that appropriate rotation of hand nut $\mathbf{8 0}$ will result in clamping of wedge brace 75 between crown washer 79 and face 81 of the extension member 63'.

As is shown in FIGS. 4, 5 and 6, rest 66 may have suitable cushioning material 87 applied to the concavely curved face of frame 70. Additional cushioning material (not shown) may also be applied and the rest 66 provided with a cover $\mathbf{8 5}$ of upholstery material such as leather, vinyl, or the like.

As shown in FIGS. 2 and 3, the rest 66 is positionable as desired within predetermined limits in the following manner. As shown in full lines in FIG. 2, when portions 61, 61' and extension members 63, $63^{\prime}$ are in vertical position, with the members $63,63^{\prime}$ in their positions of greatest telescoping into members $61,61^{\prime}$, they, with plate 67, bolts 71, 71', and bracket portion 45, form a parallogram linkage. If the upright members 61-63 and $61^{\prime}-63^{\prime}$ are swung counterclockwise from the full line position of FIG. 2 to the position in which plate 67 is in position 67 A , the rest 66 will be shifted from the position in which it is shown in full lines in FIG. 3 to the position A in which it is shown in dash-dot lines in FIG. 3. Such shifting of rest 66 would tend to place the concave surface of the rest in a position in which it would be in supporting cooperative relation with the abdominal area of a user of slender or small build sitting in an erect fashion on seat 38 with his feet extending in the direction of arrow B. Similarly, if the members $61-63$ and $61^{\prime}-63^{\prime}$ are swung clockwise from the position of FIG. 2, so that plate 67 0 is shifted into position 67 C , the rest 66 will be shifted from the position in which it is shown in full lines in FIG. 3 to position C in which it is shown in dash-dot-dot lines in FIG. 3. Such shifting would permit resting of the arms of the user on the upper surface of the rest to steady them or would permit supporting the abdominal
area of the user in the event the user prefers to sit more toward the edge of seat 38 or would serve as a back rest in the event the user was seated upon seat 38 with his feet extending in a direction substantially opposite to the direction of arrow B in FIG. 3.
To secure rest 66 in a position selected, the hand nut 80 is loosened, that is backed away from head 77 of bolt 76, so as to release wedge brace 75. As the upright members 61-63 and 61'-63' are swung counterclockwise, wedge brace 75 coupled to post bolt 71 shifts relative to bolt 76 until in position 67 A end surface 82 of slot 78 is in engagement with bolt 76. Similarly, clockwise movement of the members to the position 67C in FIG. 2 effects movement of wedge brace 75 relative to bolt 76 such that end surface 83 of slot 78 is moved into abutting engagement with bolt 76. Whether rest 66 is used as an abdominal support, that is, a rest against which the abdomen of the user may lean, or as a back rest, or as an arm rest, the forces applied to rest 66 by the user normally tend to shift the rest 66 in a clockwise direction as viewed in FIG. 2, and thus tends to cause wedge brace 75 to shift relative to post screw 76 to advance the end face 83 of slot 78 toward bolt 76. When rest 66 is positioned in the desired position, hand nut 80 is tightened to clamp wedge brace 75 adjacent bolt 76 between crown washer 79 and face 81 of extension member 63'. Further movement of wedge brace 75 relative to bolt 76 in the direction in which slot end surface 83 would be advanced toward bolt 76 is precluded by frictional engagement established between wedge brace 75 and the surface 81 and crown washer 79. Such movement would also tend to force the wedge in a direction in which increasingly thicker portions thereof would be moved into position between face 81 and crown washer 79. Thus, the tightening of hand nut 80 results in firm locking of the parallelogram linkage structure and rest 66 in selected position.

As previously explained, members 63 and $63^{\prime}$ are extendable, that is, may be secured in positions in which they extend further from portions 61, 61' than that in which they are shown in FIG. 2. Accordingly, plate 67 may be raised to an elevated position such as that indicated in dot-dash lines and denoted 67U in FIG. 2 and shiftable to positions laterally thereof similar to positions 67A and 67 C .

As shown in FIG. 7, the position of rest 66 may also be altered by altering the position of extension member 63 with reference to portion 61 without altering the position of extension member $63^{\prime}$ with reference to portion 61'. By retracting coupling member 65 from a recess 64 and then increasing the extension of member 63 from portion 61 until coupling member 65 may be engaged in a different recess 64, the effective length of the telescopable structure may be altered. When the rest 66 is in the position in which plate 67 is in the position 67 C of FIG. 2, slot 78 will be in the position shown in full lines in schematic view FIG. 7, with end surface 83 of the slot in engagement with screw 76. If member 63 is extended until bolt 71 is elevated to position 71R, the position of slot 78 in relation to screw 76 will be shifted to the position 78' shown in dash-dot-dot-dot line in FIG. 7, that is, with end surface 82 of the slot engaging screw 76. Extension member 63 may be secured in fixed relation to portion 61 by engaging coupling member 65 in a recess 64. Thus, if coupling member 65 is re-engaged in the recess 64 adjacent to the one in which it is engaged corresponding to the full line showing of rest 66 in FIG. 7, rest 66 will be tilted into the position E shown by a dashdot line in FIG. 7. If member 63 is further extended so that coupling member 65 may be engaged in the next recess 64 , rest 66 will be tilted into a position $F$ indicated by the dash-dot-dot line in FIG. 7, and if extended further so that coupling member 65 engages the next recess 64 in extension member 63, rest 66 will be tilted into the position $G$ shown in dash-dot-dot-dot line of FIG. 7, in which position bolt 71 will be in position 71R. Such re-
positioning of rest 66 into any one of the tilted positions shown in FIG. 7, as just described, would involve no alteration in the position of member $60^{\circ}$, coupling member $65^{\prime}$, extension member $63^{\prime}$, and post bolt $71^{\prime}$, about which lateral element pivoting of rest 66 would occur. Tilting of rest 66 about either bolt 71 or bolt 71' would be possible in other positions of movement of the members 60 and $60^{\circ}$ about the horizontal axes of stub shafts 51. The degree of tilting possible in any given position would be determined by the location and length of slot 78 in wedge brace 75.

It may be noted that by making rest 66 positionable in a variety of elevated positions and additionally in such elevated positions tiltable as well, the concave surface of rest 66 may be placed either in relation to the front or back of the user's body or may be positioned to support the forearm of the user as desired when the rest 66 is used to support and steady, through the forearm, the hand of the user while engaged in activities such as may be involved in the practice of dentistry or the like.

Having thus described what presently appears to be a preferred embodiment of the invention, it will be apparent to those having ordinary skill in the art to which this invention pertains that various modifications and changes may be made in the illustrative embodiment without departing from the spirit or scope of the appended claims.
Therefore, what I claim and desire to secure by Letters Patent is:

1. A stool comprising in combination a seat, an Lshaped rest carrier having a horizontal portion and an upright portion and mounted on said stool with its first end subjacent the central portion of the seat and its second end above and outboard of said seat, an arcuate rest mounted adjacent one of its ends on said rest carrier adjacent the second end thereof and supported thereby in substantially horizontal position higher than said seat, said rest carrier upright portion being swingable about the axis of the horizontal portion to carry the rest in a direction transverse of the horizontal portion of the rest carrier while supporting the rest in substantially unaltered attitude to the horizontal.
2. A device in accordance with claim 1 characterized by the fact that said stool has a bracket mounted thereon subjacent the central portion of said seat and swingable relative to said seat and said stool about a vertical axis, that said L-shaped rest carrier is secured to said bracket for swinging in unison therewith about said vertical axis.
3. A device in accordance with claim 1 characterized by the fact that said rest is pivotable relative to said upright portion of the rest carrier and about an axis parallel to the axis of the horizontal portion of the rest carrier and that means are provided to secure the said rest in fixed relation to said upright portion of the rest carrier as desired.
4. A device in accordance with claim 1 characterized by the fact that said stool has a bracket mounted thereon subjacent the central portion of said seat and swingable relative to said seat and said stool about a vertical axis, that said L-shaped rest carrier is secured to said bracket for swinging in unison therewith about said vertical axis, that said rest is pivotable relative to said upright portion of the rest carrier and about an axis parallel to the axis of the horizontal portion of the rest carrier and that means are provided to secure the said rest in fixed relation to said upright portion of the rest carrier as desired.
5. A stool which comprises an upright pedestal, a seat rotatably mounted on said pedestal, a support carrier rotatably mounted on said pedestal adjacent the seat, rest carrying uprights pivotally mounted on said support carrier for swinging about parallel substantially horizontal axes, a rest carried by the uprights, upper portions of the uprights being pivotally attached to the rest in spaced relation, and means for locking the uprights against pivoting to hold the rest in selected position.
6. A stool as in claim 5 wherein the means for locking the uprights against pivoting links the uprights.
7. A stool comprising in combination a seat, a bracket subjacent said seat, a pair of L-shaped members each having a horizontal portion and an upright portion, the horizontal portions being mounted in parallel spaced relation in said bracket and rotatable therein about their respective horizontal axes, the upright portions extending upwardly and spaced from said seat, an arcuate rest above the elevation of said seat, spaced pivot means having axes parallel to said horizontal portions, each pivot means coupling a respective one of said upright portions in supporting cooperation with said rest adjacent one end of said rest, and means actuatable to secure said upright portions in fixed relation to each other.
8. A stool in accordance with claim 7 characterized by the fact that said seat is rotatable about an upright axis and that said bracket is mounted on said seat for coaxial rotation therewith and for rotation relative thereto.
9. A stool in accordance with claim 7 characterized by the fact that said upright portions are linked in substantially parallel relation by said bracket and said rest and the pivot means coupling it to said upright portions whereby said rest is movable between positions of like attitudes.
10. A stool in accordance with claim 7 characterized by the fact that said upright portions are linked in substantially parallel relation by said bracket and said rest and the pivot means coupling it to said upright portions whereby said rest is movable between positions of like attitudes and that at least one of said upright portions is alterable in length and the rest supportable in an attitude correspondingly tilted about the axis of the pivot means coupling the other upright portion to said rest.
11. A stool in accordance with claim 7 characterized by the fact that said means actuatable to secure said upright portions in fixed relation to each other comprises a linking brace pivoted to one upright portion and non-
parallel to the axial plane of said horizontal portions and means for securing said brace to the other of said upright portions.
12. A stool in accordance with claim 7 characterized by the fact that said means actuatable to secure said upright portions in fixed relation to each other comprises a linking brace pivoted to the one upright portion nearest the end of said rest and non-parallel to the axial plane of said horizontal portions and means for clampingly securing said brace to the other of said upright portions, said brace being wedge shaped so that forces applied to the rest and tending to shift said brace generally in the direction from the upright to which the brace is pivoted to the other upright to which the brace is securable and thus tend to force a thicker portion of the brace into cooperation with said clamping means.
13. A stool in accordance with claim 7 characterized by the fact that said upright portions are swingable about their horizontal axes, said swinging being in a plane tangent to the cylindrical locus of revolution of said upright portions when vertical and swung about the axis of bracket rotation.

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