United States Patent

Radding

[15] **3,674,308**

[45] **July 4, 1972**

[54] **CHAIR**

[72] Inventor: **Jason D. Radding**, Irvine, Calif.

[73] Assignee: **Crown Imports Co., Inc.**, Newport Beach, Calif.

[22] Filed: **Oct. 2, 1970**

[21] Appl. No.: **77,667**

[52] **U.S. Cl.** **297/345**, 297/71, 297/349, 248/425

[51] **Int. Cl.** **A47c 1/06**

[58] **Field of Search** 297/71, 345, 349, 339; 248/425

[56] **References Cited**

UNITED STATES PATENTS

1,951,375	3/1934	Schwarzkopf et al.	297/71 X
2,854,065	9/1958	Fox	248/425
852,559	5/1907	Hornung, Jr.	297/71
3,368,845	2/1968	Watanabe	297/71 X

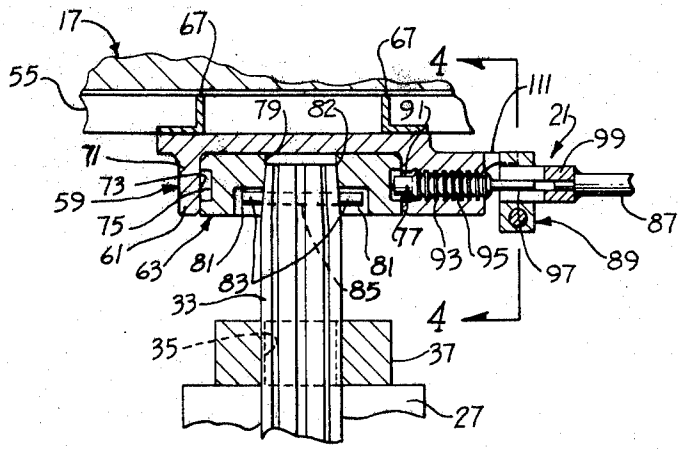
Primary Examiner—James T. McCall

Attorney—Smyth, Roston & Pavitt

[57] **ABSTRACT**

A chair comprising a base, a support shaft mounted on the base and a body supporting portion mounted on the support shaft. The support shaft is fixed against rotation relative to the base and can move generally vertically relative to the base. The body supporting portion moves vertically with the support shaft and is rotatable relative to the support shaft. A locking mechanism is carried by the body supporting portion for releasably locking the body supporting portion in a preselected angular position relative to the support shaft.

8 Claims, 4 Drawing Figures



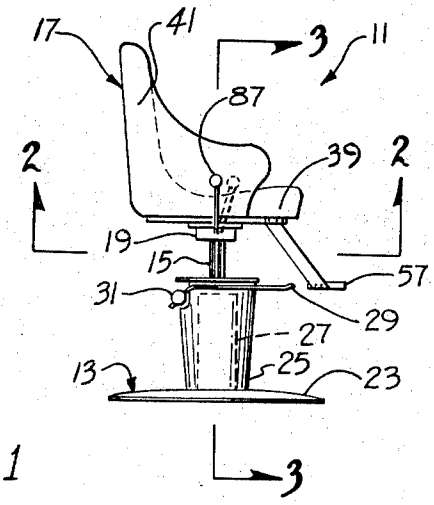


Fig. 1

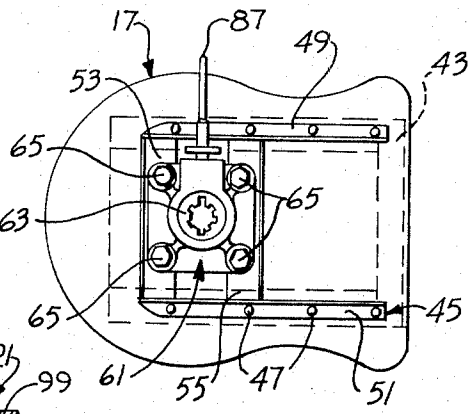


Fig. 2

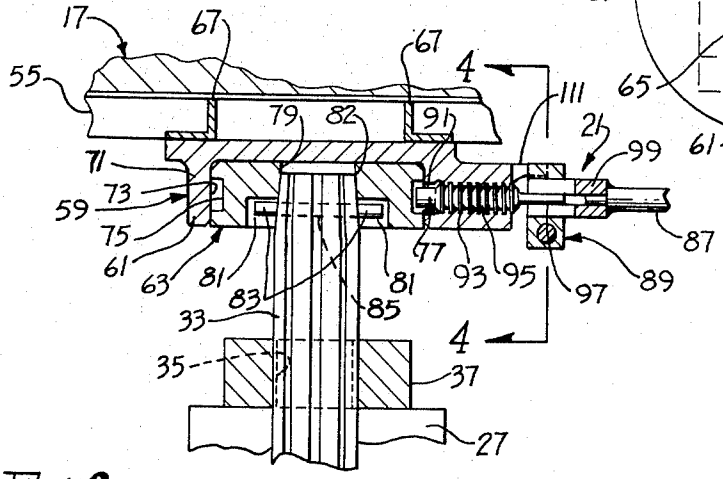


Fig. 3

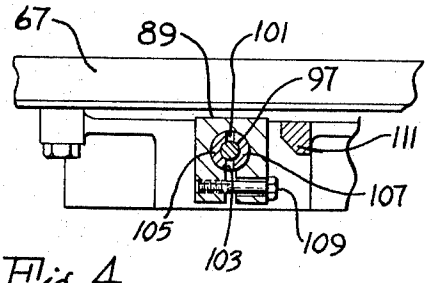


Fig. 4

INVENTOR:
Jason D. Radding
By: Smyth, Roston & Pavitt
ATTORNEYS

CHAIR

BACKGROUND OF THE INVENTION

Chairs of the type often employed by barbers and beauticians typically include a base and a body supporting portion. The body supporting portion is mounted on the base and can be elevated or rotated relative to the base.

One way to accomplish the desired movement of the body supporting portion is to provide the base with a support shaft which is both rotatable and translatable and to mount the body supporting portion on the shaft for movement therewith. The shaft and the body supporting portion are elevated by a pump or motor. The body supporting portion can be manually rotated relative to the base and locked in the desired angular position by a locking mechanism. The body supporting portion may be raised or lowered while in a locked position.

The locking mechanism is in the base and is operated by locking the shaft against rotation relative to the base to thereby hold the body supporting portion in a fixed angular position. The locking mechanism has a handle positioned on the base for operation by the foot of the operator.

With the locking mechanism as an integral part of the base, it must be sold with the base even when no locking mechanism is required thereby increasing the cost of the unit. The foot operated handle of the locking mechanism is considered by many to be an inconvenience, and it does present the problem of shoe scuffing as a result of operation of the handle. Moreover, the foot operated locking mechanism is subject to not being firmly set by the operator thereby causing the inconvenience of a second attempt at locking the locking mechanism.

SUMMARY OF THE INVENTION

The present invention eliminates all of the problems noted above. The present invention provides a chair in which the support shaft is held against rotation relative to the base and the body supporting portion is mounted on the support shaft for rotation relative thereto. The locking mechanism and the operating handle therefor are carried by the body supporting portion, and the locking mechanism is hand operated rather than foot operated thereby eliminating all of the problems noted above with respect to foot operated locking mechanisms. As the locking mechanism is not a part of the base, the cost of bases sold where no locking feature is required is reduced. Moreover, it is a simple matter to provide a body supporting portion having no locking mechanism for applications where no locking feature is required.

To implement at least some of these concepts, a mounting member having a passage therein is mounted by a race on the body supporting portion for rotation relative to the body supporting portion. The passage receives the upper end of the support shaft and is suitably drivingly connected to the mounting member. Thus, the mounting member, which may be considered as part of a bearing, simply and inexpensively mounts the body supporting portion on the support shaft for rotation relative thereto.

To prevent the body supporting portion from wobbling on the support shaft, at least one of the passage and the upper end portion of the support shaft are preferably tapered. This assures that the wall defining the passage in the mounting member and the peripheral surface of the upper end portion of the support shaft will firmly and snugly engage each other. If desired, both the passage in the mounting member and the upper end portion of the support shaft can be correspondingly tapered to provide a larger area of contact between these two members to thereby even more stably mount the body supporting portion on the support shaft. To facilitate removal of the body supporting portion from the support shaft, the angle of taper is preferably large enough so that no "sticking wedge" action is obtained.

The locking mechanism acts on the rotatable member to lock the rotatable member in the desired angular position. The locking mechanism preferably includes a cam arrangement

such as threads carried by the race and responsive to pivotal movement of the operating handle for lockingly engaging the rotatable member to thereby fix the latter against rotation relative to the body supporting portion. As used herein, the expression "locking mechanism" includes locks, brakes, or other means operative to retain the body supporting portion in a preselected angular position against the forces normally encountered during use of the chair.

The invention can be further understood by reference to the following description taken in connection with the accompanying illustrative drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a chair constructed in accordance with the teachings of this invention.

FIG. 2 is a sectional view taken generally along line 2—2 of FIG. 1.

FIG. 3 is an enlarged sectional view taken generally along line 3—3 of FIG. 1 and illustrating one form of locking mechanism usable with the chair.

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a chair 11 of the type often employed by barbers and beauticians. The chair 11 generally includes a base 13, a support shaft 15, a body support portion 17, mounting means 19 for mounting the body support portion 17 on the upper end of the support shaft 15 and a locking mechanism 21 (FIG. 3). The base 13 includes a lower plate-like member 23 and an upwardly extending housing 25 which houses a pump 27 or other suitable means for elevating the support shaft 15. The pump 27 is operated in a conventional manner by a foot pedal 29 which is mounted for oscillatory movement about a suitable shaft 31.

By pumping the foot pedal 29, the shaft 15 is elevated in a conventional manner. Similarly, by fully depressing the foot pedal 29, the support shaft 15 can be forced downwardly. Ordinarily the weight of the body support portion 17 either alone or with an occupant therein is sufficient to cause slow downward movement of the shaft 15 when the foot pedal 29 is fully depressed. The details of the pump and the manner of raising and lowering the support shaft 15 is conventional and is therefore not shown in detail herein.

The support shaft 15 is mounted for generally vertical movement along the axis thereof. The support shaft 15 is retained against rotation relative to the base 13 in any suitable manner such as by external splines 33 (FIG. 3) formed thereon and cooperating internal splines 35 formed on a collar 37 which is mounted on the pump 27. Of course, other suitable means such as a key, pin in groove arrangement, etc. can be used to prevent rotation of the shaft 15 while allowing axial movement thereof.

The body support portion 17 may be of various configurations and the illustrated construction of the body support portion is merely illustrative. The body support portion 17 includes a seat 39 and a back 41 (FIG. 1) and arm rests and other accessories may be provided if desired. The body support portion 17 is an upholstered furniture piece and includes a frame 43 (FIG. 2) of wood or similar material.

A seat bracket 45 (FIG. 2) is attached to the frame 43 in any suitable manner such as by a plurality of screws 47. The seat bracket 45 is constructed of a pair of parallel frame members 49 and 51 and a pair of parallel cross members 53 and 55. The members 49, 51, 53 and 55 are preferably strong structural members constructed of metal and may be, for example, angle iron. A foot rest 57 is mounted on the members 49 and 51.

The mounting means 19 includes the seat bracket 45 and a bearing 59 (FIGS. 2 and 3). The bearing 59 generally includes a race 61 and a mounting or inner member 63 mounted in the race for rotation relative thereto. The race 61 is rigidly

mounted by a plurality of screws 65 (FIG. 2) to a pair of straps 67 (FIG. 3) which extend between the cross members 53 and 55. The race 61 includes an end wall 69 and a peripheral wall 71 which defines a generally cylindrical cavity 73.

The mounting member 63 is sized to be slidably received within the cavity 73 and has an annular groove 75 in the peripheral surface thereof. In the embodiment illustrated, a pin 77 is receivable within the groove 75 and acts to retain the mounting member 63 in the cavity 73. The pin 77 forms a portion of the locking mechanism 21 and is described in greater detail hereinbelow. Other means in addition to the pin 77 and the groove 75 may be utilized to retain the rotatable member 63 within the cavity 73 while permitting relative rotation therebetween.

The mounting member 63 has an axial passage 79 extending therethrough and a pair of diametrically opposed, radially extending slots 81. The shaft 15 has a tapered or frustoconical upper end portion 82 which is received in the passage 79. The contact between the peripheral surface of the end portion 82 and the surface defining the passage 79 provides for firmly mounting of the body support portion 17 on the support shaft 15. If desired, the passage 79 may be correspondingly tapered to further enhance the stability of the body support portion.

The slots 81 open at their inner radial ends in the passage 79. The slots 81 receive lugs 83, respectively, which project radially outwardly of the support shaft 15. In the embodiment illustrated, the lugs 83 are end portions of a pin 85 which passes through and is retained in the upper end portion of the support shaft 15. Thus, the slots 81 and the lugs 83 cooperate to interconnect the mounting member 63 and the support shaft 15 to prevent relative rotation therebetween.

The locking mechanism 21 includes the pin 77 (FIG. 3), an operating handle 87 and a clamp 89. The pin 77 has a tip 91 which is partially receivable in the groove 75, a threaded portion 93 which cooperates with mating threads in a radial bore 95 of the race 61, and an outer section 97. By rotating of the pin 77, the threaded portion 93 moves the tip 91 toward or away from the groove 75 to thereby lock or release the mounting member 63.

The operating handle 87 has a hollow end portion 99 containing a pair of diametrically opposed axial slots 101 and 103 to thereby define arcuate resilient fingers 105 and 107 (FIG. 4). The hollow end portion 99 receives the section 97 and the clamp 89 substantially surrounds the fingers 105 and 107. The clamp 89 can be tightened by a screw 109 to thereby apply a radial inward force to the fingers 105 and 107 to urge the latter into tight frictional engagement with the section 97. Accordingly, pivotal movement of the handle 87 results in corresponding rotational movement of the pin 77.

The pin 77 cannot be unscrewed from the bore 95 because of a stop 111 which is formed integrally with the race 61 and which is engageable by the clamp 89 to thereby prevent further rotational movement of the clamp and the operating handle 87 in a direction tending to remove the pin 77 from the bore 95. Radial inward movement of the pin 77 is arrested by the contact of the end surface of the tip 91 thereof with the surface defining the groove 75. By adjusting the angular position of the clamp 89 on the operating shaft 87, the number of degrees of angular rotation of the operating handle 87 which is permitted can be adjusted. This is useful in taking up wear on the surface defining the groove 75 and the tip 91. That is, if the tip 91 or the surface defining the groove 75 wear, the stroke of the operating handle 87 necessary to cause locking can be maintained at a minimum by appropriate adjustment of the clamp 89 on the operating handle. As shown in FIGS. 1 and 2, the operating handle 87 comes from beneath the body support portion 17 and then projects upwardly to a convenient location for the operator.

In use of the chain 11, the operator can elevate the support shaft 15 and the body support portion 17 by pumping or oscillating the foot pedal 29. This causes the hydraulic pump 27 to move the shaft 15 upwardly in a conventional manner. The engagement between the end portion 82 and the wall of the passage 79 causes corresponding upward movement of the body support portion 17. To lower the body support portion 17, the operator fully depresses the foot pedal 29 and the weight of the equipment resting on the support shaft 15 is sufficient to force the support shaft 15 slowly downwardly.

With the body support portion 17 at any elevation, and with the locking mechanism 87 unlocked, the operator can manually rotate the body support portion relative to the base 13. When torque is applied to the body support portion 17, the seat bracket 45 and the race 61 rotate with the body support portion. The shaft 15 is held against rotation by the cooperating splines 33 and 35 and the shaft 15 retains the rotatable member 63 against rotation by virtue of the cooperation between the slots 81 and the lugs 83. Accordingly, the race 61 rotates while the mounting member 63 is held stationary.

When the body support portion 17 has been rotated to the desired position, the operator pivots the operating handle 87 in the appropriate direction to cause the threaded portion 93 and the tip 91 to move radially inwardly. With only a relatively small amount of pivotal movement, the tip 91 contacts the surface defining the groove 75 and thereby clamps the mounting member 63 between the race 61 and the tip 91. This frictional restraint is sufficient to lock or hold the body support portion 17 against pivotal movement during normal usage of the chair 11. By pivoting the operating handle 87 in the opposite direction, the tip 91 is taken out of contact with the surface defining the groove 75 to thereby free the member 63 and the race 61 for relative rotation.

Although an exemplary embodiment of the invention has been shown and described, many changes, modifications, and substitutions may be made by one having ordinary skill in the art without necessarily departing from the spirit and scope of this invention.

I claim:

1. A chair comprising:

a base;

a support shaft projecting generally upwardly from said base and terminating in an upper end portion;

first mounting means for mounting said support shaft on said base for generally up and down movement relative to said base;

means on said base for elevating said support shaft relative to said base;

means on said base for retaining said support shaft against rotation relative to said base;

a body supporting portion adapted to support a human occupant;

second mounting means on said body supporting portion for mounting said body supporting portion on said support shaft for rotation relative thereto and for generally up and down movement with said support shaft;

said second mounting means including a mounting member having a wall defining a passage therein, said passage receiving the upper end portion of said support shaft, at least one of said support shaft and said passage being tapered so that said support shaft engages and firmly supports said mounting member; and

releasable locking means for locking said seat against rotation relative to said support shaft.

2. A chair as defined in claim 1 wherein said upper end of said support shaft is tapered.

3. A chair as defined in claim 1 wherein both said upper end of said support shaft and said passage are tapered at approximately the same angle to thereby provide a snug fit between said upper end of said support shaft and said passage.

4. A chair as defined in claim 1 wherein said releasable locking means includes a locking member, means for mounting said locking member for movement between a releasing position in which said locking member is out of locking engagement with said mounting member and a locking position in which said locking member is advanced toward said mounting member to lock the body supporting portion against rotation relative to the mounting member, a stop for defining said

releasing position, and means for permitting adjustment of the location of said releasing position to compensate for wear of the releasable locking means and the mounting members.

5. A chair as defined in claim 1 wherein said second mounting means includes a race mounted on said body supporting portion and rotatably receiving said mounting member.

6. A chair as defined in claim 5 wherein said releasable locking means includes a locking member carried by said race and lockingly engageable with said mounting member.

7. A chair as defined in claim 6 wherein said second mounting means includes a seat bracket mounted on the underside of said body supporting portion and carrying said race.

8. A chair as defined in claim 1 wherein said releasable locking means includes a manually movable member mounted on said body supporting portion for rotation therewith and for movement relative to said body supporting portion and cam means responsive to said movement of said manually movable member relative to said body supporting portion for locking said body supporting portion against rotation relative to said support shaft.

* * * * *