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Rothermel

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[54] **ADJUSTABLE BACK REST SUPPORT FOR CHAIRS**

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[51] **Int. Cl.**.....**A47c 7/40**

[58] **Field of Search**.....297/353, 355, 361, 362, 275, 297/358, 363, 369, 304

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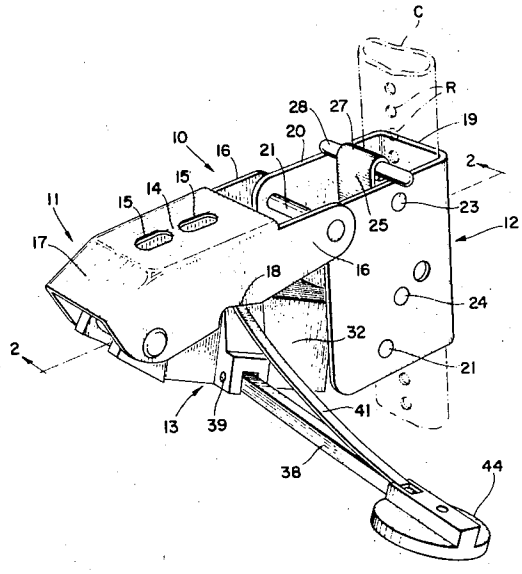
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[57] **ABSTRACT**

This specification disclosed an adjustment device for a back rest cushion or chair back which may readily be fastened in position against the underside of the seat cushion of the chair, and which incorporates means for adjusting the height of the back rest cushion, and separate means for adjusting the angular location of the back rest cushion, both such means being operated by simple spring loaded locking means, so that an adjustment may be made while actually sitting in the chair, with the locking device snapping into place as soon as the most desirable position is reached.

4 Claims, 2 Drawing Figures



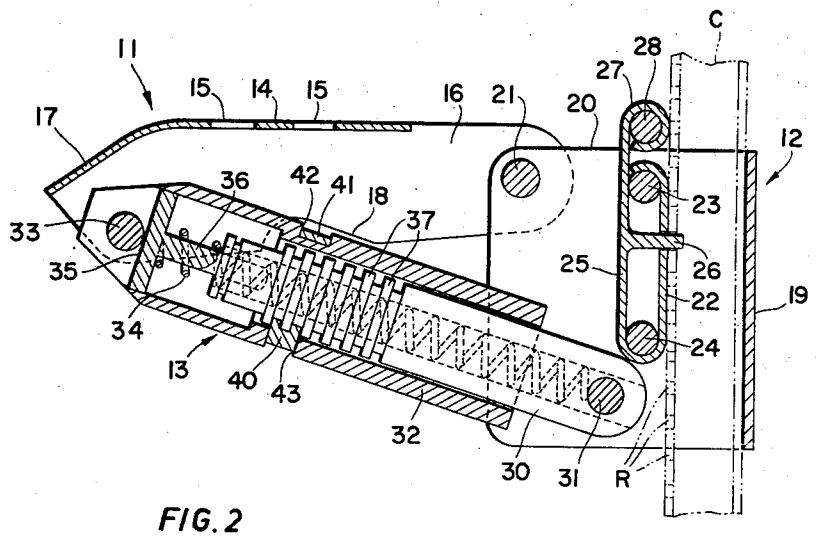


FIG. 2

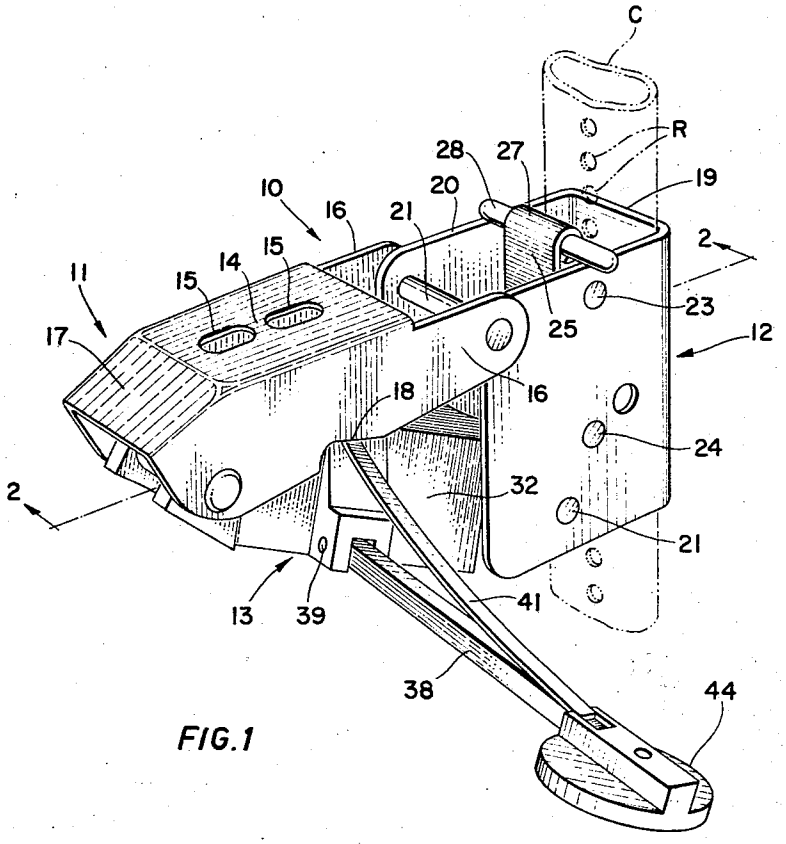


FIG. 1

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ADJUSTABLE BACK REST SUPPORT FOR CHAIRS

The present invention relates to a device for adjustably supporting the back rest cushion of a chair, or posture chair such as a secretarial chair or the like, in which a back seat cushion is supported at an adjustable elevation above a seat cushion, and may be oriented at a different angular adjustment, with relation to a vertical plane, to suit the posture of the occupant of the chair.

BACKGROUND OF THE INVENTION

Posture chairs incorporating adjustable back rest cushions, of which a secretarial or typist chair is a typical example, invariably incorporate some means for adjusting the height of the back rest cushion so as to suit the height of the occupant of the chair. Typically, this height adjustment means comprises a hand wheel, threadably mounted on a screw threaded rod, which may be tightened down against a bar or column supporting the back rest. Loosening of such a hand wheel permits back rest to be elevated or depressed. In some forms of such chair, an additional hand wheel and threaded rod is incorporated, by means of which the back rest cushion may be swung forwardly or rearwardly, and locked in a predetermined angular relationship. There are of course various obvious disadvantages to this relatively crude of adjustment. The first and most obvious disadvantage is such threaded hand wheel require to be loosened off and retightened each time an adjustment is made. Frequently if the occupant of the chair is a woman, she will not have sufficient strength to either loosen the hand wheel or tightened it up again sufficiently to hold the back rest in the desired position. Repeated movement of the chair will loosen the hand wheel and the adjustment will lost. On the other hand, if the hand wheel is tightened sufficiently, then it may be extremely difficult to loosen if off again to reposition the back rest.

Another and more serious disadvantage is the fact that such hand wheels can only be operated while the occupier is standing behind or beside the chair. It is practically impossible to operate such adjustment devices while seated in the chair. As a result, if the occupier of the chair becomes tired in one position, and finds it desirable to adjust the back rest to another position a considerable amount of time is wasted until such adjustment is made. Similarly, if the occupier is not actually sitting in the chair at the time of the adjustment is made, then it may be difficult to determine when the back rest is in the most desirable position, and several adjustments may be necessary before the optimun position is reached.

In addition, threaded adjustment means, unless made of specially hardened steel, have a habit of wearing out and requiring replacement, and frequently require some oiling, which will of course cause dirt and grime to be deposited on the hands and clothing of the occupant.

While in the past, such threaded adjustment means have been the most popular and most widely used, other forms of adjustments means have been proposed, such as various forms of other releaseable locking means, and in some cases, spring loaded catches have been used. However, in the majority of such other locking devices, their operation has generally speaking required both hands, and they have been of a relatively complex construction, rendering their manufacture uneconomically expensive as compared with threaded devices, and also subject to a high degree of unreliability, requiring frequent repairs and servicing, and often depositing oil and grime on the hands of the occupant of the chair. Preferably, such locking devices should be of simple economical construction, and sufficiently rugged to withstand many years of abuse by unskilled persons without requiring servicing, and preferably being capable of operating without repeated lubrication, and preferably being totally enclosed so as to avoid contact with the hands or clothes of the occupant of the chair. As stated, in general, such a combination of desirable features has not been achieved in the prior art for the reasons noted above.

BRIEF SUMMARY OF THE INVENTION

The present invention seeks to overcome these various disadvantages, and in particular to provide an adjustment device for such a back rest cushion, which may readily be fastened in position against the underside of the seat cushion, and which incorporates means for adjusting the height of the back rest cushion, and separate means for adjusting the angular location of the back rest cushion, both such means being operated by simple spring loaded locking means, so that an adjustment may be made while actually sitting in the chair, with the locking device snapping into place as soon as the most desirable position is reached.

More particularly, the invention seeks to provide such an adjustment device in which the angular adjustment incorporates a spring loaded device urging the back rest support into a forwardly angled position, so that the occupier, when adjusting the angular position of the back rest cushion can simply lean backwardly against such spring loading until the most comfortable position is reached afterwhich the spring loaded locking device is released, thereby locking it in that position.

Further and related objects of the invention are the provision of a simple spring loaded locking device for the height adjustment of the back support cushion, which is substantially totally enclosed, and provides a simple smoothly operating slide for sliding the back support cushion means upwardly and downwardly, with a manually operable spring loading plunger locking the same in any desired height position, when the most suitable position is reached.

More particularly, the invention seeks to provide such an adjustment device in which all of the foregoing advantages are achieved within a relatively small space, the working parts being substantially totally enclosed so as to avoid contact with the clothes or hands of the occupant, and being preferably located more or less below the seat cushion of the chair, in an unobtrusive location thereby permitting a pleasing overall design for the chair.

Further and other related advantages and objectives will become apparent from the following description of a preferred embodiment which is given here by way of example only with reference to the following drawings in which like references refer to like parts thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an upper front perspective illustration of an adjustment device according to the invention, showing a typical back rest cushion support column in phantom form, and,

FIG. 2 is a sectional side elevation of the device shown in FIG. 1, along the line 2—2.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the illustrations, it will be seen that the adjustment device according to the invention which is referenced generally at **10** comprises three main components namely a fixed attachment bracket **11**, a swingable back rest support shoe **12**, and a telescopic strut unit **13**. The swingable shoe **12** is shown supporting a portion of a typical back rest support column C shown here in phantom, for the sake of clarity only. It will of course be understood that the mounting bracket **11** intended to be fastened fixedly in position normally against the underside of a seat support cushion of a chair such as a secretary chair, and the column C is intended to extend upwardly above such seat support cushion, and support at its upper end a back support cushion, the details of the seat support cushion and back support cushion being too well known to those skilled in the art, to require any further description. However, in the particularly preferred case, the preferred form of secretary chair will comprise a base having four legs arranged in a star-shaped manner in a more or less horizontal plane, and from the center of such group of legs, a single central adjustable support column will extend upwardly, and at its upper end there will be provided a generally dish-shaped sheet metal support member, to which the seat support cushion is firmly attached. Preferably such dish-shaped sheet metal member will incorporate a predetermined planar area, arranged in a more or less horizontal plane towards the back of the seat support cushion, to which the mounting bracket **11** can be firmly bolted, so that the mounting bracket **11** is affixed directly to such sheet metal dish-shaped member which in turn is mounted directly on the support column of the chair. Thus the entire supporting structure of the chair will form a single unit, with the stresses in the back support cushion, being communicated directly to such dish-shaped sheet metal member and such support column. Thus the seat support cushion, itself, can be made in any of a wide variety of designs and materials, being either for example in a typical case a plywood base member, a foam plastic cushion and a vinyl or cloth cushion cover, or alternatively, of a homogeneous polyurethane foam construction, with a rigid polyurethane base, or any other of a variety of types of construction with complete freedom of design, since the only stresses to be supported by such seat support cushion will be the weight of the occupant, and it will not be required to provide a direct support for the mounting bracket **11**. It will of course be understood that these other features of the invention are omitted here for the sake of clarity, and are in any event merely referred to herein as being a particularly preferred form of the construction of the overall secretary chair, but otherwise form no part of the invention which is essentially directed to the adjustment device **10** rather than the chair as a whole.

The mounting bracket **11** will be seen to comprise a flat generally rectangular panel **14**, provided with two fastening holes **15** therethrough and supported on either side by means of side panels **16** bent downwardly therefrom more or less at right angles. A forward strengthening panel **17** is provided at the forward end of the flat panel **14**, for increased strength. A notch portion **18** is cut out of either side of the side panels **16** for purposes to be described below.

The back support column support shoe **12** will be seen to comprise the generally flat rectangular median panel **19**, and the two side panels **20** on either side thereof bent more or less at right angles thereto, defining a generally channel shaped shoe **12** for slidably receiving and supporting the column C therein as shown. Obviously, the size and shaping of the support shoe **12** will depend to some extent on the size and shape of the column C, and in any event are not critical to the invention, other than that they should provide firm sliding support for the column C and permit height adjustment thereof.

The back support shoe **12** is pivotally mounted on the free ends of the side panel **16**, by means of the pivot pin **21**, passing through the side panels **20** of the shoe **12**, and through the side panels **16** of mounting bracket **11** as shown. Within the support shoe **12**, the column C is guided and located, and also adjustably fastened by means of a spring leaf system comprising the fixed guide panel **22**, extending between the two locating pins **23** and **24**, and the swingable panel **25**, which is free to swing to and fro relative to the fixed panel **22**, about the lower locating pin **24**. The swingable panel **25** is provided with a locking pin **26** passing through a suitable opening in the panel **22**, and adapted to register with suitable spaced recesses R in the column R to locate the same in differing heights. The swingable panel **25** is provided with an upwardly extending loop portion **27**, and a bar member **28** extends therethrough, permitting engagement by the fingers of the operator.

It will thus be noted that substantially the entire fixed guide panels **22**, and swingable panel **25**, are located and concealed between the two side panels **20**, which therefore form a housing or casing therearound preventing contact thereof with the hands or clothes of the occupant of the chair, and at the same time providing a pleasing functional exterior appearance, which will readily blend with the design of a variety of different chairs.

Swinging movement of the shoe **12** relative to the mounting bracket **11** is controlled by means of the telescopic strut member generally shown as **13**. This strut member will be seen to comprise a control rod **30** pivotally mounted at the lower region of the shoe **12** by means of the pin **31** extending through the side panels **20** of the shoe **12**. The control rod **30** will be seen to be slidably received within the tubular sleeve member **32** provided with an interior bore snugly receiving the rod **30** therein, and which is preferably provided with a rectangular exterior, slidably received within the side panel **20** of the shoe **12** whereby to prevent twisting movement of the shoe **12** relative to the mounting bracket **11**. The sleeve member **32** is pivotally mounted to the forward end of the mounting shoe **11** by means

of the pin 33, whereby upon swinging movement of the shoe 12 relative to the mounting bracket 11, the rod 30 will slide into or out of the sleeve 32 in a telescopic manner.

The rod 30 is in fact itself hollow, and contained within it a spring 34, extending throughout the length thereof, and into contact with the interior blind end 35 of the sleeve 32. Sleeve 32 is preferably provided with a guide rod 36 extending from the blind end 35 and entering up the interior of the spring 34, whereby to ensure that the same remains aligned with the interior of the control rod 30.

In order to lock the control rod 30 in the sleeve 32 at any desired position of extension, the rod 30 is provided with a plurality of rib members 37 extending therearound and defining between them annular recesses or grooves. A locking arm member indicated as 38 is privotally mounted at 39 to the sleeve member 32 and contains an interior locking tooth member 40 adapted to engage with a rib 37, thereby locking the rod 30 and sleeve 32 in any desired position of extension. Locking bar 38 is preferably spring operated by means of the leaf spring 41, extending from the free end of the locking bar 38, and being received in a recess 42 on the upper portion of the sleeve 32. Obviously, sleeve 32 is provided with a slotted opening 43 for reception of the locking tooth member 40 therein, permitting the same to be moved into and out of engagement with the ribs 37 of the rod 30.

Preferably, the locking bar 38 is provided with some suitable handle means such as the disc 44 for hand operation.

The notches 18 cut away from the side panels 16 of the shoe 11, permit movement of the spring leaf 41, to facilitate adjustment of the device.

It will be seen that all of the essential working parts of the unit described as the telescopic strut member 13, including the major portion of the rod 30, and the whole of the spring 34, and the guide rod 36, and the rib members 37, are all enclosed and contained within the sleeve 32, and the side panels 20 of the back support shoe 12. In fact, substantially the only visible portion of the telescopic strut means 13 are the handle 38 and spring 41. Obviously, some form of handle 38 must be visible in order that it can be reached and operated by the occupant of the chair. Clearly, however, some other form of spring 41 could be substituted, which would be less obtrusive, and which would in fact be concealed from view or substantially completely enclosed within the sleeve 32 if desired, the particular spring 41 being shown here as exemplary of one particular form of construction of the invention without any limitation. Again, this form of construction ensures that all the working parts will be totally enclosed, and cannot come into contact with the hands or clothes of the occupant of the chair, and will again provide an unobtrusive and pleasing exterior appearance, which will readily blend with the design of a variety of different types of chair.

In operation, the occupier of the chair can first of all adjust the height of the back rest cushion (not shown) by simply grasping the rod 28, and drawing the swingable panel 25 forwardly, thereby withdrawing the locking pin 26 from its recess R. The column C can then be moved upwardly and downwardly to the most appropriate height, afterwhich the rod 28 is released, permitting the pin 26 to enter the appropriate recess.

In order to set the most suitable angular position of the back rest, the operator will simply sit in the chair and with the left hand grasp the disc 44 and draw it upwardly, thereby swinging the locking bar 28 upwardly and withdrawing the locking tooth member 40 from engagement with the rib 37 of the control rod 30. The back rest, and back rest support column C, and shoe 12 will then swing forwardly, under the influence of spring 34 which is biassed to extend the control rod 30 from the sleeve 32. The operator will then simply press backwardly against the pressure of the back rest cushion, thereby swinging the column C backwardly against the pressure of the spring 34 until the most desirable position is reached after which the disc 34 is released, and the tooth 40 will then engage the next appropriate rib 37 of the control rod 30.

While the foregoing invention has been described for use essentially with a posture chair such as a typical secretarial chair, its applicability is not to be limited to secretarial chairs as such, but in fact, it is deemed to be applicable to posture chairs of every kind, in which the back support cushion of the chair is required to be adjusted with relation to the seat support cushion, and for the purposes of the claims herein, reference will be made to a posture chair throughout, such reference to include secretarial chairs and all such other chairs having adjustable back support cushions.

The foregoing is a description of a preferred embodiment of the invention which is given here by way of example.

The invention is not to be taken as limited to any of the specific features as described, but comprehends all such variations thereof as come within the scope of the appended claims.

What I claim is:

1. Adjustment apparatus for use in association with a posture chair of the type having a back cushion and a seat cushion, in which the back cushion is mounted on column means and is adjustable both as to height and as to inclination relative to the seat cushion, said apparatus comprising;

mounting bracket means for fastening to said chair;

swingable support shoe means swingably mounted on said bracket means and adapted to slidably receive said back cushion column means and support the same;

releaseable locking means engageable with said column means;

adjustable telescopic strut means pivotally mounted at one of its ends to said bracket means and at its other end to said support shoe means; said strut means comprising sleeve means, forming one end of said strut means, and being open at one end, and hollow rod means forming the other end of said strut means and extending slidably into said sleeve means and snugly fitting the same, locking rib means formed on said hollow rod means, a locking arm member pivotally mounted transversely on said sleeve means and extending to one side thereof at a right angle thereto and releaseably interengageable with said locking rib means, handle means extending from said locking arm member for manual operation thereof, and spring means

extending along said locking arm and engaging said sleeve means transversely and urging said locking arm member into engagement with said locking rib means, the ends of said strut means being pivotally fastened at points on said bracket means and said support shoe means spaced from said swingable mounting between said support shoe means and said bracket means, whereby the angular position of said support shoe means relative to said bracket means is controlled by the length of said strut means.

2. Adjustment apparatus as claimed in claim 1 wherein said support shoe means is swingably mounted on said mounting bracket means along a swinging axis in a predetermined plane, and wherein said strut means is pivotally mounted to said support shoe means along the pivot axis spaced from and below said predetermined pivot axis and said other end of said strut means is pivotally mounted to said bracket means at a pivot axis spaced from said predetermined pivot axis, the three said pivot axes defining a generally triangular shape, with said strut means aligned along the longest side of said triangle, the other two sides of said triangle being shorter.

3. Adjustment apparatus as claimed in claim 1 including guide plate means located within said swingable swingable support shoe means, for guiding said back cushion column means therein, and locking pin means extending through an opening in said guide plate means, and interengageable with openings formed in said cushion column means for locking the same in varying positions, and manually operable means for withdrawing said locking pin means therefrom, and spring loaded operating means urging the same normally into engagement therewith.

4. Adjustment apparatus as claimed in claim 1 wherein said support shoe means comprises a generally channel-shaped member defining a median panel member, and two side panel members bent substantially at right angles thereto, said cushion column means sliding within said side panel member, in contact with said median panel member, and said releaseable locking means being located between said side panel members, and substantially entirely enclosed thereby.

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