July 10, 1951 E. M. MORVICE 2,560,181

RESILIENT BACK SUPPORT FOR RECLINING LOUNGE CHAIRS

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Fig. 1

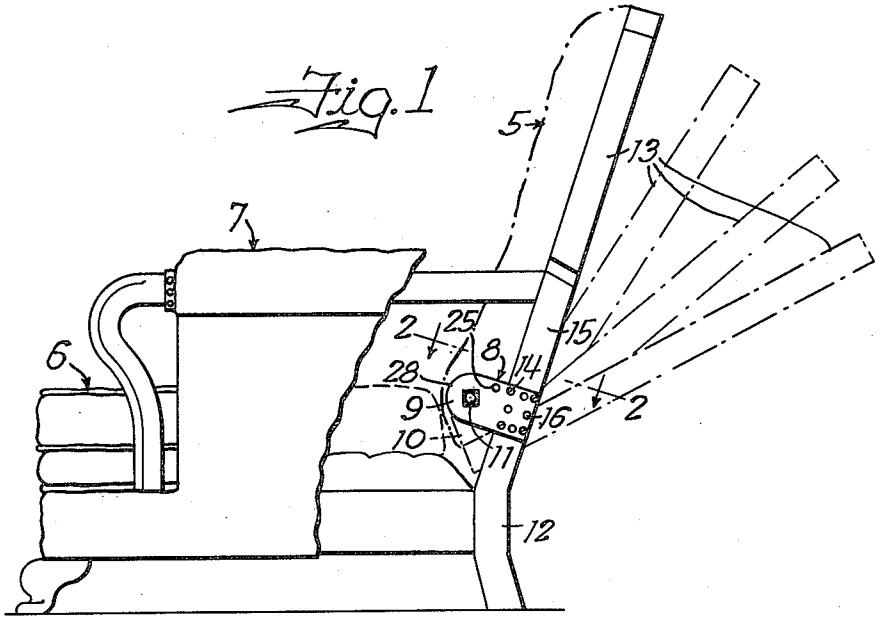
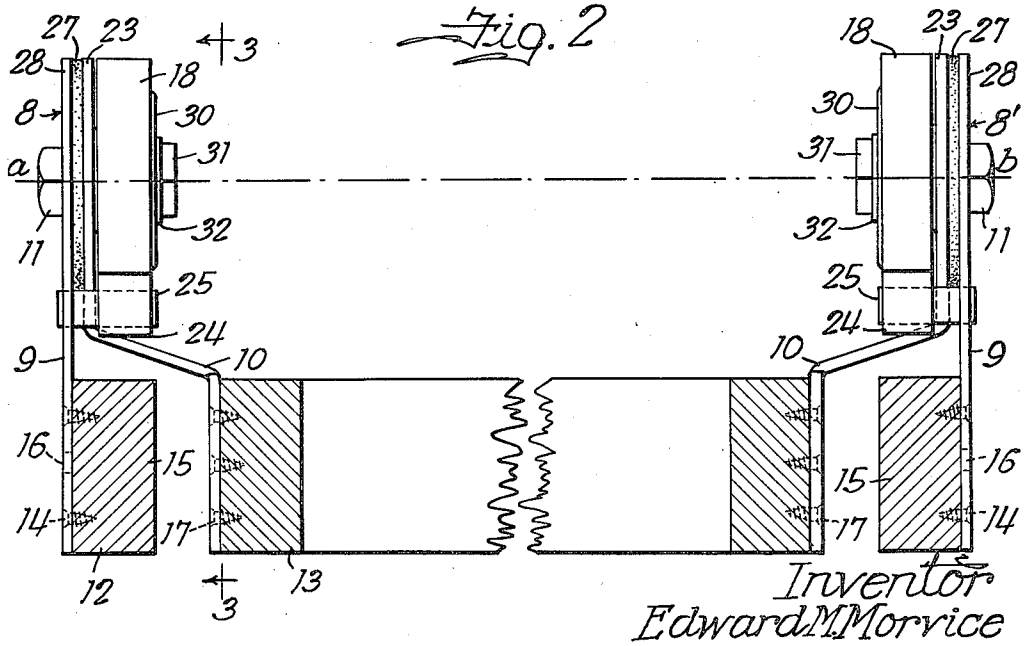


Fig. 2



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Fig. 3

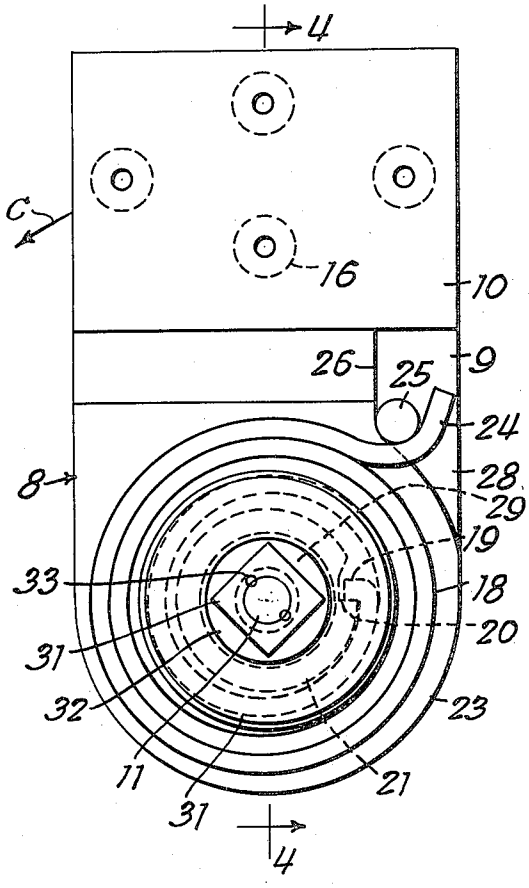
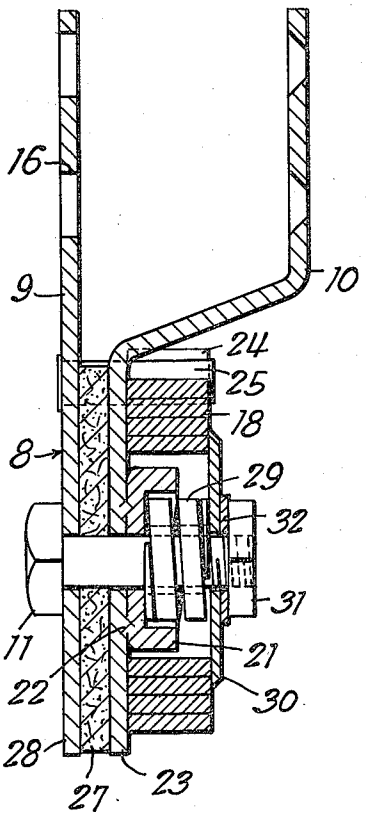


Fig. 4



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Patented July 10, 1951 2,560,181

UNITED STATES PATENT OFFICE

2,560,181

RESILIENT BACK SUPPORT FOR RECLINING LOUNGE CHAIRS

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Application January 10, 1947, Serial No. 721,171

10 Claims. (Cl. 155—164)

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This invention relates to furniture and is more particularly concerned with a new and improved back support for reclining lounge chairs.

Reclining lounge chairs have heretofore been equipped with rather complicated and expensive back supports and usually these supports were more or less "built-in" in the construction of the chair, thus adding materially to the overall cost of production of such chairs. The majority of these supports moreover tended to return the chair back with a jerky movement and too abruptly and forcibly. In most instances there were springs and friction elements which were exposed more or less so that the upholstery on the chair was apt to become entangled therewith in the back and forth movements of the chair back, not to mention the effect lint and dirt collecting on these parts would have upon the proper smooth functioning of such back supports. It is not surprising therefore that these prior structures invariably provided easily accessible adjustments which it was expected the purchaser would have to resort to sooner or later to put the chair back in "working order." It is, therefore, the principal object of my invention to provide a back support for reclining lounge chairs which avoids the objections just mentioned, a salient feature of the present construction being that it is a self-contained unit, the springs and friction means employed being all housed and substantially enclosed in the unit, so that they will function properly indefinitely and cannot become fouled by contact with upholstery, and there is no need to provide any adjustments and the installation in the chairs at the factory is greatly simplified and the cost of production of lounge chairs is accordingly lowered.

The invention is illustrated in the accompanying drawings, in which

Fig. 1 is a side view of a lounge chair embodying my invention showing some of the upholstery broken away to better illustrate the back supports that are fastened to the outer sides of the vertical back portions of the arms of the chair and to the opposite sides of the chair back adjacent the lower end thereof, the frame of the chair back being indicated in dotted lines in a number of reclining positions;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1, on a larger scale, an intermediate portion of the chair back frame being broken away to permit showing the two back support units larger;

Fig. 3 is an inner side view of one of said back support units, taken on line 3—3 of Fig. 2, showing the unit substantially full size, and

Fig. 4 is a longitudinal section on the line 4—4 of Fig. 3.

The same reference numerals are applied to corresponding parts in these four views.

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Referring to the drawings, the reference numeral 5 designates the reclining back for a lounge chair, the seat cushion of which is shown at 6 and one of the arms at 7. The back support units with which my invention is concerned are designated generally by reference numerals 8 and 8', the two being of identical construction, but of left and right hand, respectively, for the left and right sides of the chair. Each unit comprises sheet metal brackets 9 and 10 which are pivotally connected by a bolt 11 and are secured to the chair frame 12 and back frame 13, respectively, the bolts 11 of the two units on opposite sides of the chair being coaxially aligned, as indicated by the axis *a*—*b* in Fig. 2, relative to which the chair 5 pivots in reclining, as indicated by the dotted line positions of the back frame 13 in Fig. 1. This pivotal axis *a*—*b*, as should be clear by noting position of bolt 11 in Fig. 1, is close enough to the back of the seat cushion 6 to make for such slight movement of the lower portion of the back 5 relative to the seat cushion 6 that a person seated in the chair is not conscious of any to and fro movement between these portions of the chair in reclining the back and allowing it to return to the normal upright position, and there is no danger of getting clothing caught or mussed. The bracket 9 of each unit is stationary and fastened by screws 14 to the outer side of the upright back rail 15 of the arm of the chair. Holes 16 are provided in the bracket 9 in register with screw holes in the movable bracket 10 to permit reaching with a screw driver the screws 17 that are used to fasten the movable bracket to the outer side of the frame 13 of the chair back on the lower portion thereof. I shall now describe the spring means cooperating with said brackets 9 and 10 for yieldingly resisting the reclining movement of the chair back, and the friction means also cooperating with said brackets which is principally for frictionally resisting the recoil actions of said spring means but also helps to resist the reclining movement of the chair back.

Referring now mainly to Figs. 3 and 4, a heavy, closely coiled, spiral torsion spring 18, which is made of flat strip material of appreciable width, has a hook 19 on the inner end entered in a notch 20 in the periphery of a heavy cupped washer 21 that is welded, as indicated at 22, to the outer pivotal or bearing portion 23 of the bracket 10 to provide a hub portion concentric with the bolt 11. Hence, when the bracket 10 is turned relative to the bracket 9 in a counterclockwise direction, as indicated by the arrow *c* in Fig. 3, the inner end of said spring is turned with it and the torsion spring 18 is accordingly wound, due to the fact that the outer end of said spring is held against movement, the same being hooked, as shown at 24, onto a pin 25 that

projects from the stationary bracket 9. The bracket 10 has a cut away portion 26 through which the pin 25 projects from the bracket 9, as indicated in Fig. 3, and when the chair back 5 is in the normal upright position the bracket 10 is held under tension of the spring 18 in engagement with the pin 25, as shown in Fig. 3. The springs 18 of the two units cooperate to offer greater and greater resistance to the reclining movement of the back 5 the farther it is swung back. On the other hand, a person seated in the chair and reclining farther and farther will throw more and more weight on the back of the chair the farther he reclines, so that the increased spring resistance to such movement of the chair back is not very noticeable.

A friction disk 27 of leather or any other suitable material is cemented or otherwise suitably attached to the outer end portion 28 of the bracket 9 and the bearing portion 23 of the bracket 10 is pressed tightly against the friction disk by means of a coiled compression spring 29 which encircles the bolt 11 and is seated in the washer 21, the torsion spring 18 defining a chamber therein to house the cupped washer 21 and the short coiled compression spring 29, as clearly appears in Fig. 4. The spring 29 is compressed between the washer 21 and a circular plate 30 when the nut 31 that is threaded on the outer end of the bolt 11 is tightened. 32 is a washer under the nut 31 which is mounted on the bolt 11 with the plate 30, the bolt being passed through centerholes in the plate and washer. The plate 30 serves an additional function in holding the torsion spring 18 in assembled relation to the washer 21 and pin 25, but, of course, working clearance is left between the plate 30 and the spring 18 when the nut 31 is tightened to the desired extent, it being important that the spring 18 work freely. The nut 31 may be locked in adjusted position in any suitable manner, as by prick punching on diametrically opposite sides of the bolt, as indicated at 33 in Fig. 3, this method of locking being enough to avoid danger of the nut 31 backing off, and yet not interfering with the tightening of the nut at a later date if that should ever be necessary by reason of wearing away of the friction disk.

In operation, a person seated in the chair will find that the chair back 5 will provide good support at any angle of recline chosen. In other words, there is no consciousness of having to hold the chair back in a given position forcibly against spring pressure. In fact the chair back will not snap back to the upright position if the person seated in the chair suddenly leans forward; the chair back under such circumstances returns slowly to the upright position, due to the frictional resistance to turning afforded by the friction disks 27. There is no danger of lint or dirt and grit interfering with the proper functioning of the two back support units 8 and 8', because these units are self-contained and of substantially enclosed construction. There is also no danger of the upholstery on the chair becoming entangled with these units and interfering with the proper functioning thereof, and the units seldom if ever require any adjustment after their installation at the factory. The installation is greatly simplified as a result of the self-contained design of these units, it being necessary only to fasten the brackets to the chair frame and back frame.

In conclusion, it will be evident that bullet type ball detents, such as are used commonly in the furniture industry, may be provided on the stationary brackets 9 cooperating with circumferentially spaced depressions in the other brackets 10 to hold the chair back releasably in adjusted positions, or, if desired, latch means may be provided for releasably locking the chair back in adjusted positions, the latch means being of a form requiring manual operation to release the same, but being spring pressed toward locked position, that type being commonly employed in connection with reclining car seats.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. In a reclining chair, a main frame, a back frame adapted to be pivotally connected to said main frame, and a pair of coaxial, self-contained, hinge units defining the pivotal axis for and supporting said back frame, at least one of said units comprising a flat stationary bracket fixed to the main frame, a flat pivotal bracket fixed to the back frame, a bolt pivotally connecting said brackets in overlapped relation, a spiral torsion spring made of flat strip material of appreciable width closely coiled, disposed substantially concentric with said bolt and interconnecting said brackets at its inner end in radially spaced relation to said pivot and yieldingly resisting pivotal movement of the pivotal bracket in one direction, friction means between the brackets for resisting pivotal movement of the pivotal bracket in either direction, said torsion spring by virtue of its inner end being anchored in radially spaced relation with respect to the pivot bolt defining a substantially cylindrical chamber around said bolt adapted to house a short coiled compression spring, a short coiled compression spring surrounding the bolt in said chamber, and a plate mounted on the outer end of said bolt as a closure for said chamber and to retain both springs against displacement relative to the bolt and compress the compression spring so as to obtain a resilient braking pressure on the friction means.

2. In a reclining chair, a main frame, a back frame adapted to be pivotally connected to said main frame, and a pair of coaxial, self-contained hinge units defining the pivotal axis for and supporting said back frame, at least one of said units comprising a stationary bracket fixed to the main frame, a pivotal bracket fixed to the back frame, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a single friction disk between said end portions frictionally resisting pivotal movement of said brackets, a bolt pivotally connecting said end portions and carrying thereon a coiled compression spring under compression holding the end portions in engagement with the friction disk, and a spiral torsion spring surrounding the bolt and compression spring and interconnecting said end portions yieldingly to resist pivotal movement of the pivotal bracket in one direction.

3. In a reclining chair, a main frame, a back frame adapted to be pivotally connected to said main frame, and a pair of coaxial, self-contained hinge units defining the pivotal axis for and supporting said back frame, at least one of said units comprising a stationary bracket fixed to the main frame, a pivotal bracket fixed to the back frame, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a bolt extending through and pivot-

ally connecting said end portions, one of said end portions having a cupped portion in substantially coaxial relation to said bolt, a spiral torsion spring surrounding and connected at its inner end to said cupped portion and connected at its outer end to the other bracket to resist pivotal movement of the one bracket relative to the other in one direction, and a coiled compression spring surrounding said bolt and seated in said cupped portion and arranged to be compressed by tightening of said bolt to urge the end portions of said brackets together frictionally to resist pivotal movement therebetween in either direction.

4. A structure as set forth in claim 3, including a sheet of friction material between the overlapped end portions of said brackets.

5. In a reclining chair, a main frame, a back frame adapted to be pivotally connected to said main frame, and a pair of coaxial, self-contained hinge units defining the pivotal axis for and supporting said back frame, at least one of said units comprising a stationary bracket fixed to the main frame, a pivotal bracket fixed to the back frame, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a bolt extending through and pivotally connecting said end portions, one of said end portions having a cupped portion in substantially coaxial relation to said bolt, a spiral torsion spring surrounding and connected at its inner end to said cupped portion and connected at its outer end to the other bracket to resist pivotal movement of the one bracket relative to the other in one direction, a coiled compression spring surrounding said bolt and seated in said cupped portion and arranged to be compressed by tightening of said bolt to urge the end portions of said brackets together frictionally to resist pivotal movement therebetween in either direction, and a plate carried on said bolt and serving to hold the torsion spring in place on the cupped portion.

6. In a reclining chair, a main frame, a back frame adapted to be pivotally connected to said main frame, and a pair of coaxial, self-contained hinge units defining the pivotal axis for and supporting said back frame, at least one of said units comprising a flat stationary bracket fixed to the main frame, a flat pivotal bracket fixed to the back frame, said brackets having end portions of substantial area disposed in overlapping relationship, a bolt pivotally connecting the overlapped end portions of said brackets, a spiral torsion spring made of flat strip material of appreciable width closely coiled, disposed substantially concentric with said bolt and interconnecting said brackets at its inner end in radially spaced relation to said bolt to yieldingly resist pivotal movement of the pivotal bracket in one direction, friction means between the overlapped portions of the brackets for resisting pivotal movement of the pivotal bracket in either direction, said torsion spring by virtue of its inner end being anchored in radially spaced relation to said bolt defining a substantially cylindrical chamber substantially concentric with said bolt adapted to house a short coiled compression spring, and a short coiled compression spring in said chamber surrounding the bolt and caged thereon in compressed condition so as to provide resilient braking pressure on the friction means.

7. A recoil check device comprising two flat brackets, one of which is adapted to have pivotal movement relative to the other, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a single friction disk between said end portions frictionally resisting pivotal movement of said brackets, a bolt pivotally connecting said end portions and carrying thereon a coiled compression spring under compression holding the end portions in engagement with the friction disk, and a spiral torsion spring surrounding the bolt and compression spring and interconnecting said end portions yieldingly to resist pivotal movement of the pivotal bracket in one direction.

8. A recoil check device comprising two brackets, one of which is adapted to have pivotal movement relative to the other, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a bolt extending through and pivotally connecting said end portions, one of said end portions having a cupped portion in substantially coaxial relation to said bolt, a spiral torsion spring surrounding and connected at its inner end to said cupped portion and connected at its outer end to the other bracket to resist pivotal movement of the one bracket relative to the other in one direction, and a coiled compression spring surrounding said bolt and seated in said cupped portion and arranged to be compressed by tightening of said bolt to urge the end portions of said brackets together frictionally to resist pivotal movement therebetween in either direction.

9. A structure as set forth in claim 8, including a sheet of friction material between the overlapped end portions of said brackets.

10. A recoil check device comprising two brackets, one of which is adapted to have pivotal movement relative to the other, said brackets having end portions of substantial area disposed in overlapping pivotal relationship, a bolt extending through and pivotally connecting said end portions, one of said end portions having a cupped portion in substantially coaxial relation to said bolt, a spiral torsion spring surrounding and connected at its inner end to said cupped portion and connected at its outer end to the other bracket to resist pivotal movement of the one bracket relative to the other in one direction, and a coiled compression spring surrounding said bolt and seated in said cupped portion and arranged to be compressed by tightening of said bolt to urge the end portions of said brackets together frictionally to resist pivotal movement therebetween in either direction, and a plate carried on said bolt and serving to hold the torsion spring in place on the cupped member.

EDWARD M. MORVICE.

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Certificate of Correction

Patent No. 2,560,181 July 10, 1951

EDWARD M. MORVICE

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 55, for "member" read *portion*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of September, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.