Nov. 25, 1969 L. PROPUS 3,480,323

RESILIENT VENTILATED BACK AND SEAT SUPPORT

Filed Feb. 6, 1968 2 Sheets-Sheet 1

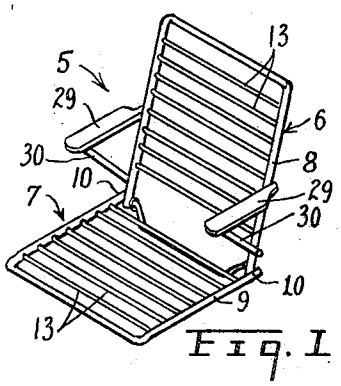


Fig. 1

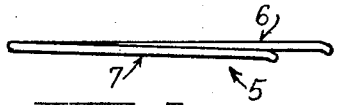


Fig. 2

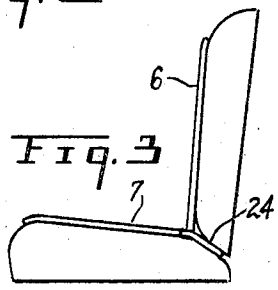


Fig. 3

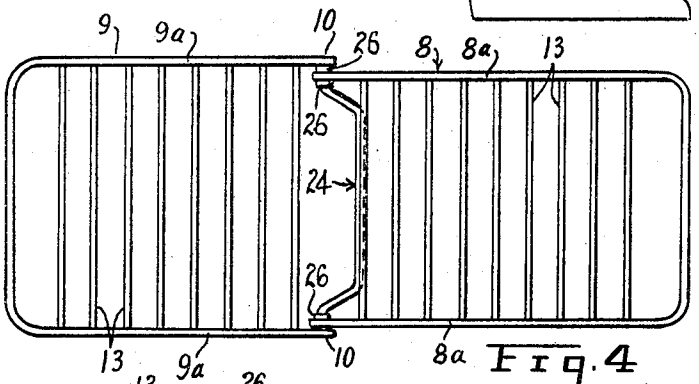


Fig. 4

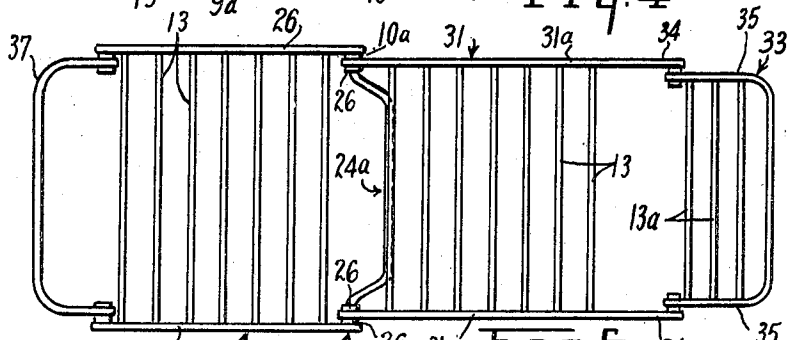


Fig. 5

Fig. 6

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RESILIENT VENTILATED BACK AND SEAT SUPPORT

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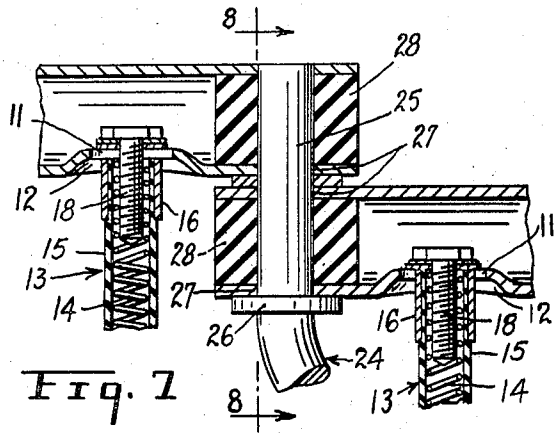


Fig. 7

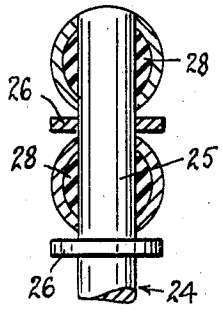


Fig. 8

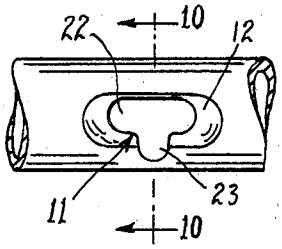


Fig. 9

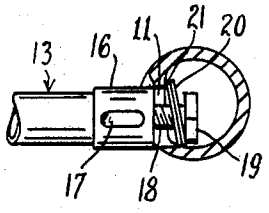


Fig. 10

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RESILIENT VENTILATED BACK AND SEAT SUPPORT

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Int. Cl. A47c 4/02
U.S. Cl. 297—253 9 Claims

ABSTRACT OF THE DISCLOSURE

A back and seat support in which both the back and seat are skeletal frames pivotally joined together and a series of coil springs are stretched between side members of the frames and are covered by rubber or plastic tubing. In one form the skeletal frames are U shaped, pivotally joined together at the free ends of the side members of the U shape, and in a modified form the frames consist of straight side members pivotally joined together at adjacent ends and shallow U shaped members are pvotally joined to the opposite ends of the straight side members, one of the latter shallow U shaped members forming an adjustable head rest.

This invention relates to resilient ventilated back and seat supports and particularly to such supports which can have a variety of uses such as in automobiles, chesterfields or similar cushioned furniture or be fashioned into a beach chair or the like.

The invention consists essentially of seat and back support frames hinged together and in which is incorporated a series of flexible support strands to take the weight of and support the user. The flexible strands each consist of a coil spring enclosed within a tubular covering of rubber or hard wearing plastic material which will expand and contract with deflection of the coil springs. The ends of the coil springs are fitted with a headed screw and a washer, the threads, of the screws engaging with the coils of the springs. The seat and back frames, in one form, each consist of a U shaped pivotally connected together at the free ends of the side legs of the U shape. The opposing surfaces of the side legs of the U frames each have a series of T shaped apertures into which the head of the screws and washers of the flexible strands are fitted and locked. The lengths of the flexible strands being such that they are stretched and are held under tension between the side legs of the U frames.

A cylindrical ferrule is fitted over each end of the rubber tube and is secured thereon by indenting the ferrule into the surface of the rubber tube.

In a modified form of the invention each of the back and seat frames consist of a pair of straight spaced apart side members and a shallow U shaped member, one pivotally connected to the front end portion of the side members of the seat to form a ground support and the other pivotally connected to the top end portions of the side members of the back, the shallow U shaped member attached to the back frame is provided with a series of flexible strands and forms a head rest when pivoted into a position in the plane of and extends beyond the top ends of the back frame.

A shallow U shaped member has its end portions forming the pivot bearing between the seat and back frames and is provided with a pair of stop collars against which the side members of the seat and back frames bear under the tension of the flexible strands. All of the pivot bearings include a rubber insert set in the end portions of the adjacent hollow frame members to provide a friction grip on the pivot bearings tending to hold the frame members in any adjusted position relative to each other.

The object of the invention is to provide a seat and back rest which is light in weight and readily adjustable to the contour of a seat or other body supporting form or be used as a beach chair.

A further object of the invention is to provide a pair of U shaped seat and back frames, the free ends of the legs of which have their end portions pivoted together and are held together under tension by a multiple of flexible strands.

A further object of the invention is to provide T shaped slots in the side legs of the U shaped frames, and a series of flexible strands each consisting of a coil spring enclosed in a stretchable tube and closed at their ends by a headed screw and washer, the head of the screws and washers being held in locking engagement within the T shaped slots.

A further object of the invention is to provide means for protecting the ends of the rubber covered flexible strands from damage by chafing against the metal seat frame.

A further object of the invention is to provide a seat and back rest section in which an adjustable head rest is secured to the back rest and all sections have transversely disposed flexible strands composed of coil springs within a flexible tube.

A further object of the invention is to provide a back and seat support which can be supported in a horizontal plane as a lounge and in which a head rest forms one support for the structure.

A further object of the invention is to provide a seat and back support in which the members are pivotally joined together, the pivots each including friction members to hold the members in their adjusted position.

These and other objects of the invention will be apparent from the following detailed specification and the accompanying drawings in which;

FIG. 1 is a perspective view of a resilient ventilated back and seat support according to one form of the invention.

FIG. 2 is a side elevation of the support shown in FIG. 1, in its folded condition.

FIG. 3 is a side elevation of the support shown in FIG. 1 fitted on an automobile seat.

FIG. 4 is a plan view of the support shown in FIG. 1 but adjusted to a flat plane.

FIG. 5 is a view similar to FIG. 4 but showing a modified form of the support showing a pivoted front end support member and a head rest support member.

FIG. 6 is a side elevation of the structure shown in FIG. 1.

FIG. 7 is a sectional plan view of a typical pivot connection between members of the seat and back frames.

FIG. 8 is a transverse section taken on the line 8—8 of FIG. 7.

FIG. 9 is a partial side elevation of one side member of a frame showing the T slot for anchorage of the flexible support strands.

FIG. 10 is a transverse section through the T slot shown in FIG. 9 and showing the means for anchoring the flexible support strands in the frame member.

Referring to the drawings the back and seat support 5 particularly shown in FIGS. 1 to 4 consists of a back support member 6 and a seat support member 7. The back and seat members 6 and 7 each consist of a U shaped frame 8 and 9 respectively, pivotally connected together at 10.

The U shaped frame 8 is of slightly less width than the U shaped frame 9 in order to permit the frames to be pivoted into a common plane as shown in FIG. 2, for carrying or storage purposes.

Each of the U shaped frames 8 and 9 are preferably formed of hollow tubing and a series of T shaped slots

11 are punched in the opposing faces of the side legs 8*a* and 9*a* as shown in detail in FIGS. 9 and 10. The surface of the tubing about the T shaped slots 11 is slightly indented at 12 to provide a protected flat surfaced seat against which the flexible support strands 13 are anchored. The T shaped slots 11 in the opposing side legs 8*a* and 9*a* are aligned with each other in order that the flexible support strands will span the space between the legs 8*a* and 9*a* in parallel arrangement.

The flexible support strands 13 each consist of a coil spring 14 of small diameter and whose length is predetermined relative to the width between the legs 8*a*—8*a* and 9*a*—9*a* so as to provide the required degree of tension to adequately support the weight of the user. For instance, the tension in the strands in the back support member 6 could be less than the tension in the strands in the seat support member 7.

Each coil spring 14 is covered by a tube 15 of resilient material such as rubber or other suitable material. The tube 15 is preferably a close fit over the spring 14 and a cylindrical ferrule 16 is fitted over each end of the tube 15 and has its surface indented at 17 into the tube to secure the ends of the tube on the spring 14.

Fitted into each end of the coil spring 14 is a threaded screw 18, the threads of which engage with the coils of the spring. The screws 18 have a shallow head 19, and a washer 20 and lock washer 21 are interposed between the head 19 and the exposed end of the flexible strand assembly leaving a space aproximately the thickness of the wall of the hollow tube forming the legs 8*a* and 9*a*.

In securing the flexible strands 13 between opposing legs 8*a*—8*a* and 9*a*—9*a*, the head 19 and washers 20 and 21 are inserted through the horizontal component 22 of the T slots 11 and that portion of the shank of the screw 18 between the end of the tube 15 and the washers 20 and 21 is allowed to drop into the vertical component 23 of the T slot 11, in the manner shown in FIGS. 7 and 10.

In fitting the flexible strands in place in the T slots, one end of the strand is fitted in a T slot and the flexible strand is stretched in order to fit the opposite end into an opposite T slot, thereby giving the necessary tension to the flexible strand required to comfortably support the wearer. The flexibility of the strands 13 permit this operation with ease and the applied tension on the strands effectively prevent dislodgement of the strands out of their anchor slots.

A support member 24 of shallow U shape is disposed between adjacent ends of the U shaped back and seat members 6 and 7. This support member 24 has a pair of axially aligned outwardly projecting pivot pins 25 each having a collar 26 at their inner ends. The pivot pins 25 project through apertures 27 in the end portions of the side legs 8*a* and 9*a* of the members 6 and 7 and the collars 26 hold these side legs 8*a* and 9*a* in spaced apart relation against the tension of the flexible strands 13.

Plugs 28 of elastomeric material are fitted into the open ends of the legs 8*a* and 9*a* and are bored to fit tightly over the pivot pins 25 and provide a friction grip on the pins to the extent that the back and seat members 6 and 7 can be rotated about the pivot pins 25 and be held by friction in any adjusted position relative to each other. By the same token the support member 24 can be adjusted to any desired position relative to the back and seat members 6 and 7.

If desired, a pair of arm rests 29 can be pivotally mounted on the side legs 8*a* of the back support member 6 and are supported in a horizontal position by the arms 30 which are adjustable with respect to the arm rests in well-known manner to permit the arm rests to be folded down parallel with the legs 8*a*.

In FIGURES 5 and 6 there is shown a modified form of back and seat support. In this form the back and seat members 31 and 32 each consist of a pair of straight side legs 31*a* and 32*a*. The adjacent end portions of these side legs 31*a* and 32*a* are held in spaced apart arrangement by the support member 24*a* in the same manner as the support member 24 described above.

The back support member 31 is provided with a head rest comprising a U shaped member 33 pivotally secured to the end portions 34 by pivot arrangements similar to that shown in FIGURES 7 and 8 and described above. A series of head supporting flexible strands 13*a* similar to the flexible strands 13 are anchored in the side legs 35 of the U shaped member 33 also in the manner above described. If desired means 36 can be provided to lock the head rest in its extended position shown in FIGURE 5.

The seat support member 32 is provided with a U shaped member 37 which is pivotally secured to the adjacent ends of the side legs 32*a* and is also provided with pivot arrangements similar to that shown in FIGURES 7 and 8.

In the modification shown in FIGURES 5 and 6 the back and seat members 31 and 32 can be supported in a more or less horizontal position by using the members 24*a*, 33 and 37 as ground supports or in the case of both showings of the device, they can be laid out flat as in FIGURES 4 and 5 and be used on the top of a bed or couch to provide a ventilated support.

The device above described provides a light weight support which can be used in any number of locations in the home or outdoors. With the different degree of tension in the flexible strands in the back and seat portions the user can be assured of maximum comfort under all conditions. In addition the flexible head rest provides the desired support which is not attained by the rigid head rests commonly provided in automobiles at the present time.

What I claim is:

1. A resilient, ventilated back and seat support comprising a pair of hollow U shaped frames consisting of a pair of spaced apart side members and an end connecting member, one of said frames having greater width than the other frame, pivot means connecting the adjacent free ends of the side members of the frames permitting one frame to be folded within the other frame, a series of T-shaped slots in the opposing faces of the side members of the frames, the said slots in one member being aligned with the slots in the opposite side member, and resilient support means anchored in the said T shaped slots and bridging the opposing side members of the frame, the said resilient support means each consisting of a coil spring of less length than the distance between opposing tide members of the frames, a sleeve of resilient material covering the coil springs, a headed screw threadingly engaging in the ends of the coil springs and a washer interposed between the ends of the springs and the head of the screws, the said washers and head of the screws adapted to be inserted through the horizontal component of the T shaped slots and the body portion of the screw adjacent the washer engaging in the vertical component of the T-shaped slot to anchor the resilient support means under tension in the frames.

2. A device as set forth in claim 1 in which the said resilient support means hold the said free ends of the U shaped frames in pivotal engagement with each other.

3. A device as set forth in claim 1 in which the end portions of the said sleeve of resilient material is sealed to the end portions of the coil spring by a ferrule.

4. A device as set forth in claim 1 in which the said pivot means includes a shallow U-shaped member the end portions of which are bent outwardly into axial alignment with each other to form pivot bearings, and a collar on said pivot bearings limits the inward movement of the side members of the U shaped frames against the tension of the resilient support members.

5. A device as set forth in claim 1 in which a plug of elastomeric material closes the free ends of the side members of the U shaped frames and the said pivot means extend through the said plugs to form a friction pivot bearing.

6. A device as set forth in claim 1 in which the said U shaped frames each consist of a pair of straight spaced apart side members and a pair of shallow U shaped members having their free end portions pivotally connected to

the end portions of the straight side members opposite from the pivotal connection of the pair of frames, the said shallow U shaped members adapted to be pivotally folded between the straight side members.

7. A device as set forth in claim 6 in which a plug of resilient material closes the ends of the straight side members adjacent the said shallow U shaped members, and a pivot pin on the free ends of the shallow U shaped members extends through the said plugs to form a friction bearing.

8. A device as set forth in claim 6 in which one of the said shallow U shaped members is an adjustable head rest and a series of said resilient support means extend across between the side members of the said one shallow U shaped member.

9. A device as set forth in claim 1 in which an arm rest is pivotally and adjustably mounted side members of the one of said frames forming the back support.

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JAMES T. McCALL, Primary Examiner

U.S. Cl. X.R.

5—191; 160—328, 371; 297—231