

[54] SINGLE SUSPENSION LOUNGER

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[22] Filed: Oct. 11, 1972

[21] Appl. No.: 294,883

[52] U.S. Cl. 297/277

[51] Int. Cl. A63g 9/00

[58] Field of Search 297/277, 276, 274, 273,
297/281

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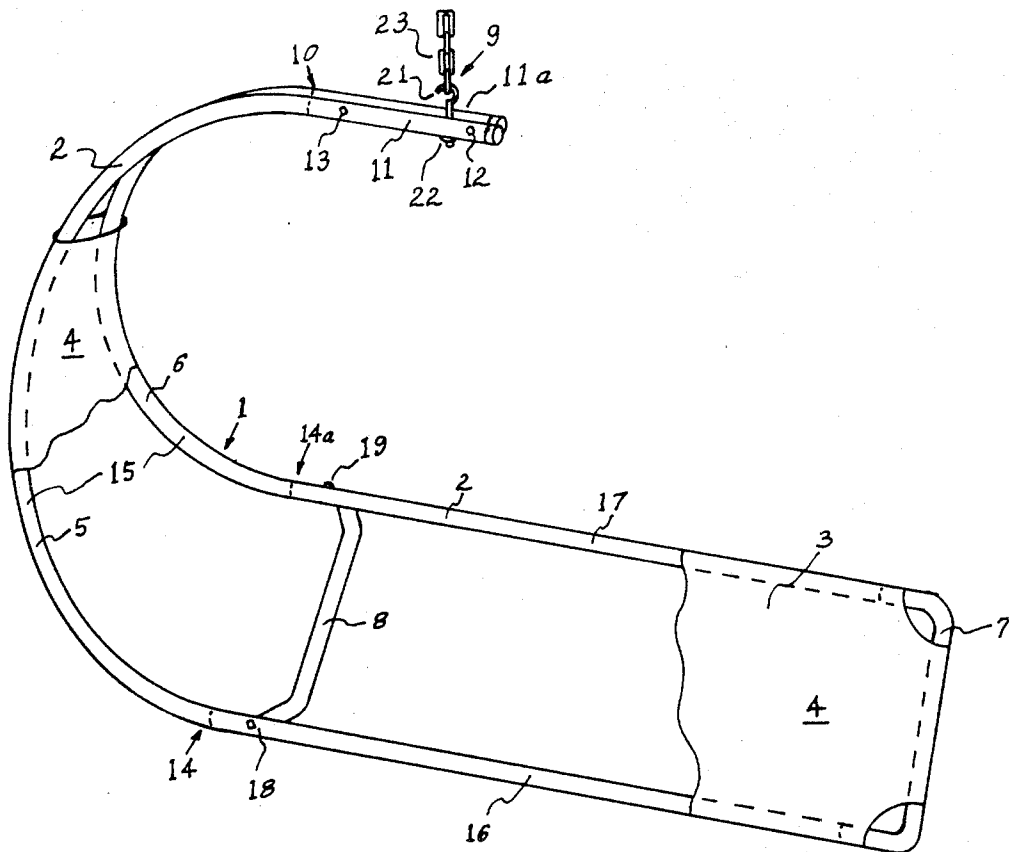
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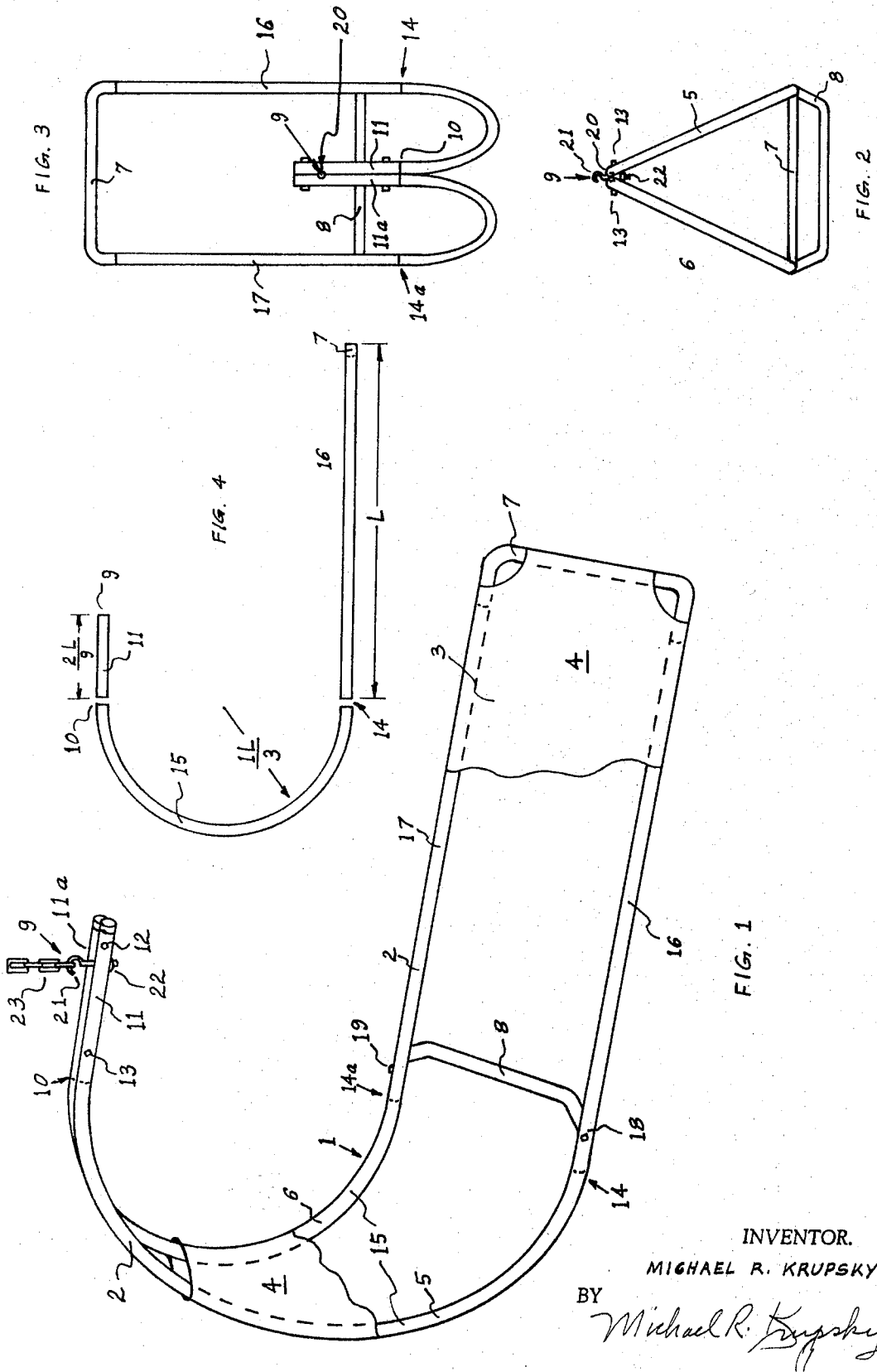
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[57] ABSTRACT

A vertically suspended curved rest lounger having upper auxiliary straight support portions being adjacent and joined to one another and extending from the upper end of two curved back rest members wherein said auxiliary straight support portions provide weight bearing struts to suspend the lounger at a single point for swinging, oscillating, and revolving, of the lounger in balance and within the trace of gravity lines from the single suspension point to two lower horizontally opposed auxiliary straight support portions extending from the lower end of the two curved back rest members, wherein said two lower horizontally opposed auxiliary portions are joined by a brace at their respective ends to provide a space for the placing and joining of a flexible rest pad between the said curved back rests and said lower auxiliary portions thereby providing a rest area for humans.

1 Claim, 4 Drawing Figures





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SINGLE SUSPENSION LOUNGER

This invention relates to the seating and reclining rest furniture arts. More particularly it relates to a single suspension lounge apparatus for humans which automatically adjusts its position by the simple action of the shifting of body weight, and thereby enabling an individual(s) to assume a variety of resting positions in the lounge.

Unlike conventional loungers, recliners, and other seat and rest furniture products, this lounge invention is not stationary. It is suspended, rather than being supported on a solid surface as is the case with other rest furniture devices. The suspension characteristics of this lounge provide for a completely novel, different, and unique resting sensation. In addition, a greater degree of mobility is achieved with this invention because of its ability to swing, oscillate, and revolve.

This suspension lounge is also quite different from existing hammocks. Conventional hammocks are suspended, but they are hung from two points of suspension. A rest apparatus such as a hammock, having two points of suspension, provides only one directional movement. A hammock can only swing sideways. This invention can also swing sideways, but it can also swing forward and backward and rotate. Furthermore, it is very possible for an individual to roll sideways and fall out of a hammock, because the hammock can rotate horizontally 360° about its two axis points. With this single suspension lounge invention it is highly improbable for an individual using the lounge to accidentally roll sideways and fall out of it, because this lounge cannot rotate horizontally. This lounge rotates vertically about its single axis of suspension. Additionally, an individual will not be able to tilt forward and fall out of this lounge with proper, but not unduly restrictive usage; because of the novel interdependent relationship of this lounge's interacting elements. This lounge has much more stability than a hammock and other suspension seats. The unique combination and relationship of the component elements in this invention is described in detail later.

Another distinct advantage that this single suspension lounge has over hammocks and other rest apparatus is that this lounge provides a floating sensation as contrasted to the static sensation provided by hammocks, and the stationary feel of other rest furniture devices. This invention has more stability than other rest apparatus, but in addition it provides for automatic adjustment to a variety of body positions, multiple directional movement, and a unique resting sensation.

There exists seating apparatus generally shaped and formed like conventional chairs which are hung from a single point of suspension. These hanging chair-like devices enable an individual to sit only in the device; and not to assume a variety of resting positions ranging between sitting upright and lying prone, that this single suspension lounge provides. It will be seen later that this invention is more functional and a distinct advancement over the referred to single suspension seat apparatus, and all other related seating and reclining rest furniture arts.

As a result of the unique relationship and combination of the component elements of this invention, and the novel application of physics in the construction of this single suspension lounge, a remarkably safe and relaxing rest apparatus for humans is achieved.

In conventional rest furniture devices no one apparatus provides all of the aforesaid benefits and advantages that this invention provides. As disclosed herein, the multiple advantages of this lounge are achieved in a safe and practical unit.

The principal object of this invention is to provide a unique apparatus for relaxation wherein the novel combination and relationship of its parts interact with one another to allow shifting weight masses of a human body resting in a single suspension lounge not to disrupt the stability, balance, and equilibrium engineered into the apparatus.

A second object of this invention is to provide a suspension lounge device that is shaped and constructed so as to conform, accommodate, and automatically adjust to a variety of resting positions assumed by humans of differing weights and heights while using the lounge.

A third object of this invention is to provide a single suspension lounge apparatus wherein the length of one set of weight bearing struts are dimensionally dependent reciprocally upon the length of an opposing set of weight bearing struts in order to accomplish stable and yet flexible ranges of balance and equilibrium of the suspension lounge when an individual is using the apparatus.

A fourth object of this invention is to provide a suspension lounge device wherein a single point of suspension on the apparatus allows the lounge to rotate 360° about a vertical axis, and yet limits and controls the vertical and horizontal movement to within predefined limits as predetermined by the construction of the lounge.

A fifth object of this invention is to provide a lounge having a flexible and contour forming material support to act as a body rest pad.

A feature of the invention is the use of resilient material such as metal tubing curved substantially in semi-circular form for the suspension lounge, in order to provide inherent strength to the device as a mechanical structure, while at the same time embodying an engineering design permitting unique and practical function and economical manufacture.

The principles of operation and construction are more fully described in the following specification, in connection with the accompanying drawings, in which,

FIG. 1 is a perspective view of the suspension lounge device of this invention with portions of the rest pad broken away.

FIG. 2 is a rear view of the suspension lounge framework drawn to a reduced scale.

FIG. 3 is a top view of the suspension lounge framework drawn to a reduced scale.

FIG. 4 is a schematic side view of the device of FIG. 1 illustrating the dimensional ratio of the interdependent component elements of this lounge as a mechanical structure.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now to FIGS. 1, 2 and 3 the invention is shown as a single suspension lounge 1 having structural frame members 2 which can be made of suitable materials such as tubular metal, fibreglass, or wood. The frame members 2 act as the overall support framework of the lounge 1, and provide a means to anchor suitable flexible materials such as fabric, plastic, or

other synthetic materials 3. The materials 3 are suspended between the framework and provide a rest pad 4 upon which an individual can assume a variety of resting positions.

In FIGS. 2 and 3 it can be seen that the frame members 2 provide a framework that is symmetrical.

Referring to FIG. 1, the framework consists of two identically shaped frame members 5 and 6, a front connecting member 7 and a spacing brace 8. From the suspension point 9 to location 10, on the frame members 5 and 6, the framework is generally straight and horizontal. The two extension portions forming the suspension struts 11 and 11a of the framework defined from suspension point 9 to location point 10 are adjacent to one another and generally joined to one another in two places by bolts and nut means 12 and 13 which pass through holes in the suspension struts 11 and 11a. Frame members 5 and 6 extend downward in divergent relationship to one another from location point 10 to locations 14 and 14a on the frame members 5 and 6 and are fabricated to be generally curved in a semi-circular shape to form the back rest 15 of the lounge 1. From the two lower ends of the back rest 15, at locations 14 and 14a, the framework is constituted of two generally straight body rest extension portions 16 and 17 which extend forward in a general parallel relationship to one another and are engineered to be balanced horizontally, or pitched upward at a small angle, to the ground. The body rest extension portions 16 and 17 are then joined together by the front connecting member 7 and spread apart by the spacing brace 8. Connecting member 7 is generally swaged in a conventional manner to fit into the cavity ends of the extension portions 16 and 17 when the framework is of tubular construction. The spacing brace 8 has threaded nuts or other conventional threaded means located at each end of the brace 8 to accommodate bolts 18 and 19 which pass through holes in the frame members 2 and are turned into the nuts located at the ends of the spacing brace 8.

Referring to FIGS. 2 and 3 there is located at the suspension point 9 a hole 20 which passes vertically through the upper framework suspension struts 11 and 11a of the lounge 1. An eye hook 21 is inserted through the hole 20 with its open eye section extending above the top of the framework. The lower end of the eye hook 21 is fabricated to form a bolt head upon which a washer 22 rests or is seated. A suitable flexible chain, rope or cable 23 is then attached to the upper end of the hook. The chain can then be attached to any overhead member such as a roof beam, a tree limb, or a support stand for the lounge 1 in any conventional manner in order to suspend the lounge 1 above the ground.

The construction and design of the single suspension lounge 1 as described is carefully engineered to be a distinct advancement over existing single suspension seat or rest furniture apparatus as is explained in further detail hereinafter. The shape and unique co-relationship of the component portions of this invention provide a more functional lounge that currently exists. In conventional suspension rest apparatus there is little, if no, means provided to allow an individual to assume a variety of rest positions between sitting upright and lying prone without disrupting the balance and equilibrium of the rest apparatus in its relationship to its single suspension point. In most single suspension rest apparatus, an individual can only generally assume

an upright sitting position. In some single suspension swings, means are provided by a front extension of the seat portion to enable a person to rest their legs on the swing. However, there are no means provided for the individual to assume a semi-prone, or prone position, without the swing hammock tilting forward and causing an imbalance of the apparatus and the probable danger of falling out of the apparatus.

Additionally, in some single suspension swings a ball socket joint suspension means does not allow the sideways movement of the swing hammock when an individual is entering the apparatus or when an individual is swinging while in the apparatus. This constraining limit placed upon the swing hammock by a ball socket joint suspension means causes severe and unnecessary strains and stresses upon the tubular framework members. These strains and stresses can distort the tubular members and cause a twisting imbalance of the apparatus which can render it nonfunctional. Furthermore, a dangerous condition exists with a suspension means that does not enable sideways movement of the swing in that referred to stresses can cause a rigid suspension member to snap and the individual using the apparatus could be severely injured in a fall.

Referring to FIG. 4, the unique function of, and the novel relationship of the component parts of this invention are explained. It is most significant and important to understand how the seemingly simple, yet highly dependent relationship of the component parts of this invention, and its general design and shape, provide a most unique single suspension lounge having a much greater degree of stability and dynamic balance over existing single suspension seats and swing hammock apparatus.

The back rest 15 is formed as a curve in order that the weight load forces that the lounge 1 will support is transmitted throughout the length of the members 5 and 6 (see also FIG. 1), and therefore the weight load is not specifically concentrated at any one point on the curved members 5 and 6 as would occur if the frame members 5 and 6 were formed in a non-curvilinear shape. The members 5 and 6 diverge from the location point 10 on members 5 and 6 in order to accommodate the width of an individual resting in the lounge 1.

In order for a single suspension lounge to be a universal product so that most people can lie prone in the lounge 1, the overall length of the lounge should be between 72 and 80 inches. Additionally, there is a critical and interdependent dimensional relationship that exists between the suspension strut members 11 and 11a and the body rest extension portions 16 and 17. The length L of the body rest extension portions 16 and 17, measured from the location points 14 and 14a on the lounge 1 to the free end of the lounge as defined by the front connecting member 7, should be approximately 54 to 60 inches. Combining the 54 to 60 inch length of the body rest extension portions 16 and 17 with a radius measurement of 18 to 20 inches of the two curved frame members 5 and 6, provides a lounge having an overall length between 72 and 80 inches.

In order for a single suspension lounge having a length of 72 to 80 inches to be in a substantially horizontal plane while a human is sitting or lying prone in the lounge, the length of the two suspension struts 11 and 11a should be approximately 12 to 14 inches long. The length of the suspension struts 11 and 11a is determined by measuring the length between the suspension

point 9 and the location point 10 on the frame members 2.

The way to determine where the location point 10 is on the lounge 1 is generally to measure the length of the substantially straight portion of the suspension struts 11 and 11a from the suspension point 9, to the point where the frame members 5 and 6 begin to curve and diverge. It has been discovered that the suspension strut members 11 and 11a (see also FIG. 1), of the lounge 1 have to interact in a definite relationship with the body rest extension portions 16 and 17 in order for a single suspension lounge to be stable, well balanced, mobile, comfortable, and functional.

Additionally, it has been discovered that for the body rest extension portions 16 and 17 to be generally disposed horizontally when the lounge is suspended, or at a small upward angle of pitch to the ground while a human is resting in a variety of positions in the lounge 1, the top suspension struts 11 and 11a of the lounge must be two ninths ($2/9$) of the length of the body rest extension portions 16 and 17. The critical interdependent dimensional relationship of the length of the body rest extension portions 16 and 17, and the length of the suspension struts 11 and 11a is determined and expressed by the following formula:

If the length of the body rest extension portions 16 and 17 are L then, the length of the suspension struts 11 and 11a must be approximately $2L/9$.

It has also been discovered that in the preferred embodiment of this invention wherein the back rest 15 is comprised of two semi-circular curved frame members 5 and 6, the radius of the curve of the frame members 5 and 6 is a critical dimension and is in an interdependent co-relationship with the suspension struts 11 and 11a and the body rest extension portions 16 and 17 of the lounge 1.

In order for a single suspension lounge to provide the benefits, have the advantages, and function as previously described, the radius of the curve of frame members 5 and 6 should be one third of the length L of the body rest extension portions 16 and 17 and should also have an angular extent of approximately 180° .

Therefore, if the length L of the body rest extension portions 16 and 17 is 54 to 60 inches, then the radius of the frame members 5 and 6 should be 18 to 20 inches. The formula for determining this third critical dimension is:

If the length of the body rest extension portions 15 and 16 are L then, the radius of the semi-circular curved frame members 5 and 6 must be approximately $1L/3$.

It should be emphasized that all three component portions of this lounge 1 — the suspension struts 11 and 11a, the radius of the curved back rest members 5 and 6, and the body rest extension portions 16 and 17, must be dimensioned in the foregoing formula or ratio relationship in order for the lounge 1 to function as previously described.

Additionally, the suspension struts 11 and 11a and the body rest extension portions 16 and 17 from location points 14 and 14a on the lounge 1, must generally

be fabricated to be in a horizontally parallel relationship to one another.

The dimensions of this lounge are of course, a matter of choice. However, it is most important that the dimensional relationship as explained by the formula and analysis above be adhered to in order to make a single suspension lounge stable, mobile, and above all, functional while a human rests in a variety of positions in the lounge.

The unique and novel combination of several elements in this lounge interacting with one another provide an advancement over existing single suspension loungers in that the sum of the parts of this invention in effect produce results greater than the whole of its parts. The novel relationships of the component elements and the uniqueness and versatility of this lounge will be quite apparent to the reader, since no single suspension swings, hammocks, or loungers provide all of the aforementioned advantages and functions encompassed in this invention.

While in accordance with the patent statutes I have described what at present are considered to be the preferred embodiments of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is therefore aimed in the appended claims to cover all such equivalent variations as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A single suspension lounge comprising

a. a pair of arcuate back rest portions, wherein said back rest portions are generally semicircular having a radius and angular extent of approximately 180° ,

b. a pair of generally parallel body rest portions extending from corresponding ends of said back rest portions and having a length L, wherein said back rest portions generally have a radius of $1L/3$ in relationship to said body rest portions,

c. a cross member connected to the free ends of the said body rest portions,

d. a single suspension means for suspending the lounge from a support, said means being mechanically-coupled to a pair of suspension portions extending from the other ends of said back rest portions, said suspension portions having a length $2L/9$ taken from the point of suspension to the said other ends of the back rest portions, whereby said length and dimensions of said suspension portions extending from the other ends of said back rest portions will be suspended in a plane substantially parallel to the plane containing said body rest portions, and whereby said lengths and dimensions of said body rest portions of said lounge will be generally horizontally suspended, and wherein the said back rest portions converge from the said body rest portions to the said suspension portions,

e. a pad of flexible material suspended between the body rest portions and the back rest portions.

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