May 6, 1952 . A. KOST 2,595,272

MECHANICAL CHAIR

Filed May 21, 1947

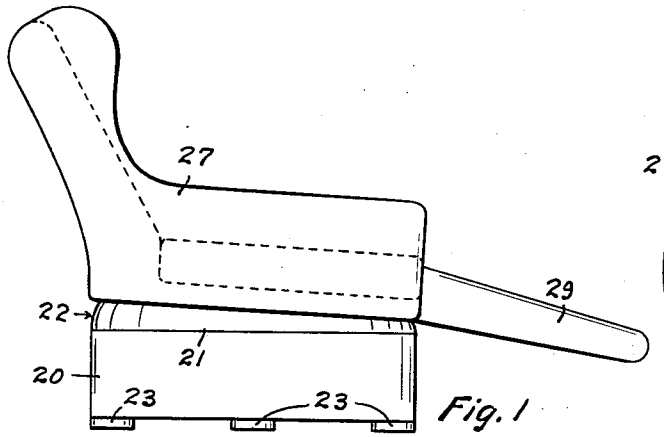


Fig. 1

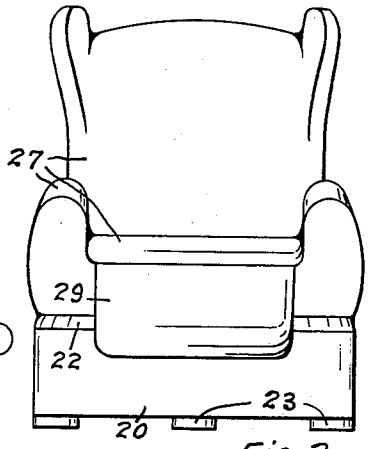


Fig. 2

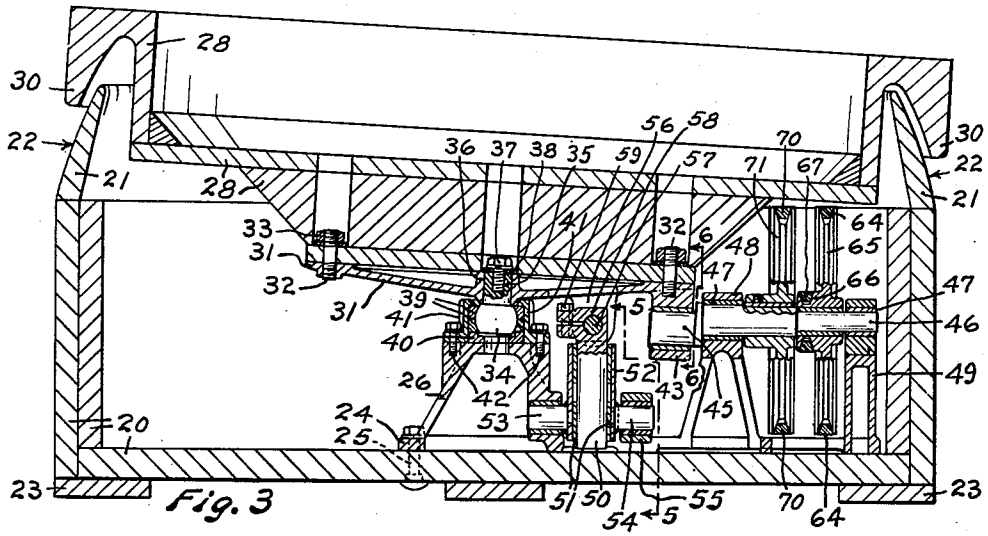


Fig. 3

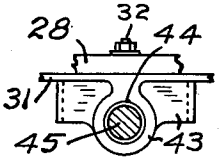


Fig. 6

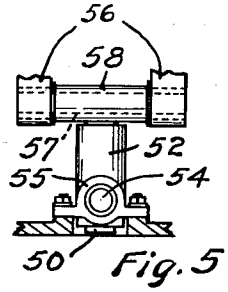


Fig. 5

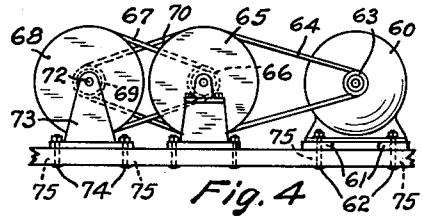


Fig. 4

INVENTOR.

Alwin Kost

BY Fred C. Matheny

ATTORNEY

Patented May 6, 1952

2,595,272

UNITED STATES PATENT OFFICE

2,595,272

MECHANICAL CHAIR

Alwin Kost, Portland, Oreg., assignor to Kost Multiple X, Inc., Portland, Oreg., a corporation of Oregon

Application May 21, 1947, Serial No. 749,538

5 Claims. (Cl. 128—33)

1

This invention relates to a mechanical chair or similar articles having driven means for imparting thereto a restful and relaxing movement.

An object of this invention is to provide an article of furniture having a support for the body of a person and having mechanical means connected with said support for imparting to the same a movement that is highly restful and relaxing to a person thereon.

This invention is herein illustrated as applied to a chair but it will be understood that the same may be applied to a bed or cradle or to any like article of furniture.

The means for imparting movement to the furniture article herein disclosed is of a type somewhat similar to that disclosed in my prior patent on Mechanical Movements, No. 2,246,689 issued June 24, 1941.

Another object of this invention is to provide a chair or similar piece of furniture having means for imparting thereto a movement of relatively slow speed that is highly restful and relaxing to a person thereon and that tends to induce sleep.

Other objects are to provide an article of furniture of this type that is smooth and noiseless in operation and that is very strong and durable.

Other objects will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings Figure 1 is a side elevation of a preferred form of chair constructed in accordance with this invention.

Fig. 2 is a front elevation of the same.

Fig. 3 is a vertical sectional view in a radial plane through the base portion of this chair, parts of the upper structure of the chair being omitted.

Fig. 4 is a detached elevational view showing the driving means used in structure shown in Fig. 3.

Figs. 5 and 6 are fragmentary vertical sectional views, with parts in elevation taken substantially on broken lines 5—5 and 6—6 of Fig. 3.

Like reference numerals designate like parts throughout the several views.

The chair shown in Figs. 1 to 6 will first be described. Said chair comprises a box like base housing 20 of suitable size and shape. The upper portion of the base housing 20 has an inwardly inclined, upwardly extending, annular member 21 rigidly secured thereto. The member 21 is provided with a spherical outer wall 22 for reasons hereinafter explained. Preferably foot members 23 are attached to the under side of the base and are adapted to rest on a floor or like support. A metal base plate 24 is disposed within the housing 20 and is secured to the bottom of said housing 20 as by bolts 25.

2

The base plate 24 has an upwardly extending bracket 26 that is positioned centrally of the housing 20 and carries a ball and socket means by which the upper structure of the chair is supported. The upper structure of the chair comprises a suitably upholstered portion 27 mounted on a chair seat base 28. The upholstered portion preferably has a leg rest 29 extending forwardly therefrom, as shown in Figs. 1 and 2. The chair seat base 28 has an annular peripheral flange 30 that fits over the annular member 21 and operates in close enough proximity to the spherical wall 22 of said inner member 21 so that there will be substantially no danger of any person becoming pinched between these two relatively moving members.

The chair seat base 28 is fixedly secured to a metal disc or spider 31, as by bolts 32 and nuts 33. A ball 34 has a stem 35 that fits within a tubular socket 36 in the disc 31 and is rigidly secured thereto by a cap screw 37 and washer 38. The ball 34 is supported for universal movement by bearing means 39 that rests on a collar 40. The bearing means 39 and collar 40 are disposed within a bracket 41 of inverted cup shape that is secured to the central bracket 26 by cap screws 42. The parts just described thus form universal joint means for supporting the upper structure of the chair for universal movement.

The metal disc 31 has a downwardly extending bracket 43 rigidly connected with the peripheral portion thereof. A bearing member 44 in the bracket 43 rotatively receives a crank 45 that is slightly inclined relative to the axis of the shaft 46 and the crank 45 and shaft 46 are positioned so that their projected axes intersect at the center of the ball 34. The shaft 46 is rotatively supported in bearing members 47 in spaced apart upwardly extending brackets 48 and 49 on the metal base plate 24. Obviously rotation of the shaft 46 will impart a gyratory movement to the chair seat base 28 and to the upper chair structure.

In addition to the above described means for imparting to the upper structure of the chair the movement just mentioned I also provide means controlling tilting of the upper chair structure about an axis common to the ball 34 and the crank 45 and for imparting to said upper chair

structure a sidewise rocking movement. This means comprises an upright piston 50 slidably disposed in a bearing member 51 in a sleeve 52. The sleeve 52 has two rigid horizontal aligned pivot studs 53 and 54 projecting radially therefrom near its bottom end. The pivot stud 53 is rotatively supported in the bracket 26. The pivot stud 54 is rotatively supported in another bracket 55 on the base plate 24. The horizontal axis common to the two pivot studs 53 and 54 intersects the vertical axis that passes through the center of the ball 34. The upper end portion of the piston 50 is connected with the metal disc 31 by pivot means having a horizontal axis that is positioned at right angles to the axis of the piston 50 and at right angles to the common axis of the pivot studs 53 and 54. The pivot means for connecting the upper end portion of the piston 50 with the metal disc 31 comprise two spaced apart lugs 56, see Fig. 5, on the disc 31 that rotatively support a shaft 57. The shaft 57 is rigidly clamped in a cross bracket 58 that is rigid with the upper end portion of the piston 50. This cross bracket 58 can be split, as shown in Fig. 3, and the two parts thereof can be clamped on the shaft 57 by cap screws 59.

The projected axis of crank 45 passes through the center of ball 34 and the axis of pivot shaft 57 is at right angles to and intersects this projected axis of crank 45. The piston assembly comprising parts 50 to 59 inclusive controls tilting of the upper chair structure about this axis common to crank 45 and ball 34. When crank 45 is revolved this axis will be moved in a conical path and the piston 50, being pivotally supported by studs 53 and 54, will be caused to rock on these studs and will impart to the upper chair structure a back and forth tilting movement about this common axis of crank 45 and ball 34. The vertical component of movement imparted by crank 45 to pivot shaft 57 will be taken care of by reciprocating movement of piston 50 in sleeves 51, 52.

A means for driving the shaft 46 to thereby impart movement to the upper structure of the chair is shown in Figs. 3 and 4. This means comprises a motor 60 resting on rubber pads 61 and secured to the bottom of the housing 20 by bolts 62. The motor 60 has a speed reduction driving connection with the shaft 46 by means of small pulley 63, V belt 64, belt wheel 65, small pulley 66, V belt 67, belt wheel 68, small pulley 69, V belt 70 and belt wheel 71. The belt wheel 65 and pulley 66 are rigid with each other and are rotatively mounted on the shaft 46. The belt wheel 68 and pulley 69 are also rigid with each other and are mounted on shaft means 72 supported by bracket means 73 that is secured to the bottom of the housing 20 by bolts 74. The belt wheel 71 is keyed or otherwise non-rotatively secured to the shaft 46.

Preferably means are provided for tightening all of the belts 64, 67 and 70. One way of doing this is to provide slots 75 for the bolts 62 and 74 which secure the motor 60 and bracket 73 respectively to the bottom of the housing 20. The slots 75 are positioned so that the motor 60 and bracket 73 can be adjusted toward and away from the shaft 46. Obviously the adjustment needed for properly adjusting the tension of the belts 64, 67 and 70 can be provided for in other ways. Obviously silent chains and the proper sprocket wheels therefor can be used in place of the belts 64, 67 and 70 and pulleys 63, 65, 66, 68, 69 and 71.

The belt drive just described is substantially silent and provides for the required speed reduction.

The bearing members 39 and 47 and all other bearing members in the structure shown in Figs. 1 to 6 are preferably of a material which will operate for a long period of time without lubrication.

In the operation of the structure shown in Figs. 1 to 6 the motor 60 operating at normal speed will impart a relatively slow rotation to the shaft 46. This causes the crank 45 to impart gyratory movement to the upper chair structure. When the upper chair structure is thus moved its connection with the piston 50 will impart to it a sidewise tilting movement or oscillation. Thus continuous three-dimensional movement is imparted to the upper chair structure. This relatively slow three-dimensional movement has been found to be very restful and relaxing and sleep inducing to a person seated in the chair.

The foregoing description and accompanying drawings clearly disclose preferred embodiments of this invention but it will be understood that these disclosures are merely illustrative and that changes can be made within the scope and spirit of the appended claims.

I claim:

1. A chair comprising a base portion; an upper structure; a ball and socket joint mounting said upper structure on said base portion; a driven crank connected with said upper structure operable to simultaneously pivotally oscillate said upper structure about a horizontal axis and a vertical axis; and a piston connected with said upper structure operable to simultaneously pivotally oscillate said upper structure about another horizontal axis substantially at right angles to said first mentioned horizontal axis.

2. A chair comprising a base housing; a supporting bracket in said base housing; a disc; a ball and socket joint mounting said disc on said supporting bracket; an upper chair structure carried by said disc; a driven crank connected with said disc and operable to simultaneously pivotally oscillate the same about a horizontal axis and a vertical axis; and a piston connected with said disc operable to simultaneously pivotally oscillate said disc about another horizontal axis substantially at right angles to said first mentioned horizontal axis.

3. A chair comprising a base housing; a supporting bracket in said base housing; a disc; a ball and socket joint mounting said disc in a generally horizontal position on said supporting bracket; an upper chair structure carried by said disc; a horizontal driven shaft; a crank on said shaft connected with said disc and operable to simultaneously pivotally oscillate said disc about a horizontal axis and about a vertical axis; a substantially upright piston positioned below said disc; a pivot positioned below said disc with its axis at right angles to the axis of said horizontal driven shaft and pivotally connecting said piston with said disc; a sleeve slidably supporting said piston; and a pivot positioned with its axis substantially parallel to the axis of said driven shaft and pivotally mounting said sleeve on said supporting bracket, whereby said piston is operable to simultaneously pivotally oscillate said disc about another horizontal axis substantially at right angles to said first mentioned horizontal axis.

4. A chair comprising a base housing; a supporting bracket in said base housing; a disc; a ball and socket joint mounting said disc in a

generally horizontal position on said supporting bracket; an upper chair structure carried by said disc; a horizontal driven shaft; a crank rigid with the inner end portion of said shaft and inclined relative to said shaft so that the projected axes of said crank and said shaft intersect, said shaft and said crank being positioned so that the point where their projected axes intersect is coincident with the center of said ball and socket joint and said crank being connected with said disc and operable to simultaneously pivotally oscillate said disc about a horizontal axis and a vertical axis; and a piston connected with said disc operable to simultaneously pivotally oscillate said disc about another horizontal axis substantially at right angles to said first mentioned horizontal axis.

5. A chair comprising a base housing; a supporting bracket in said base housing; a disc; a ball and socket joint mounting said disc on said supporting bracket; an upper chair structure carried by said disc; an externally spherical

portion rigid with the upper end portion of said base housing and having a center of curvature coincident with said ball and socket joint; a skirt on said upper chair structure extending over and movable in close proximity to said spherical portion; and driven means in said base housing operable to impart an undulating movement to said disc and the upper chair structure carried thereby.

ALWIN KOST.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,602,196	Iverson	Oct. 5, 1926
1,984,397	Dalyze	Dec. 18, 1934
2,284,445	Pettit	May 26, 1942
2,349,837	Wettlaufer	May 30, 1944