Nov. 25, 1969 D. K. KILCUP 3,480,007

ROLLER BACK CHAIR

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FIGURE 1

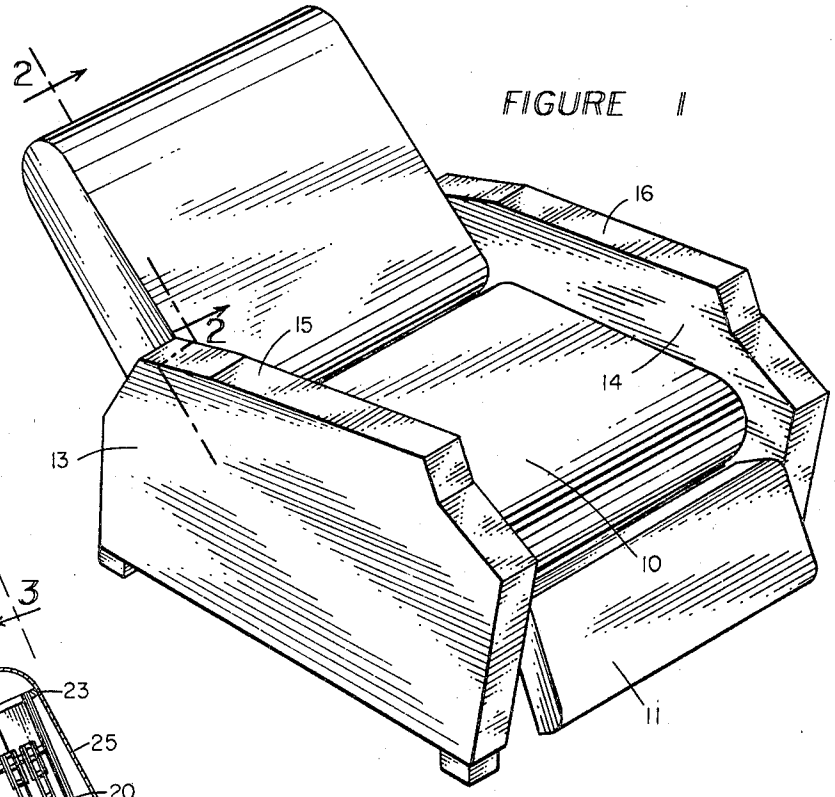
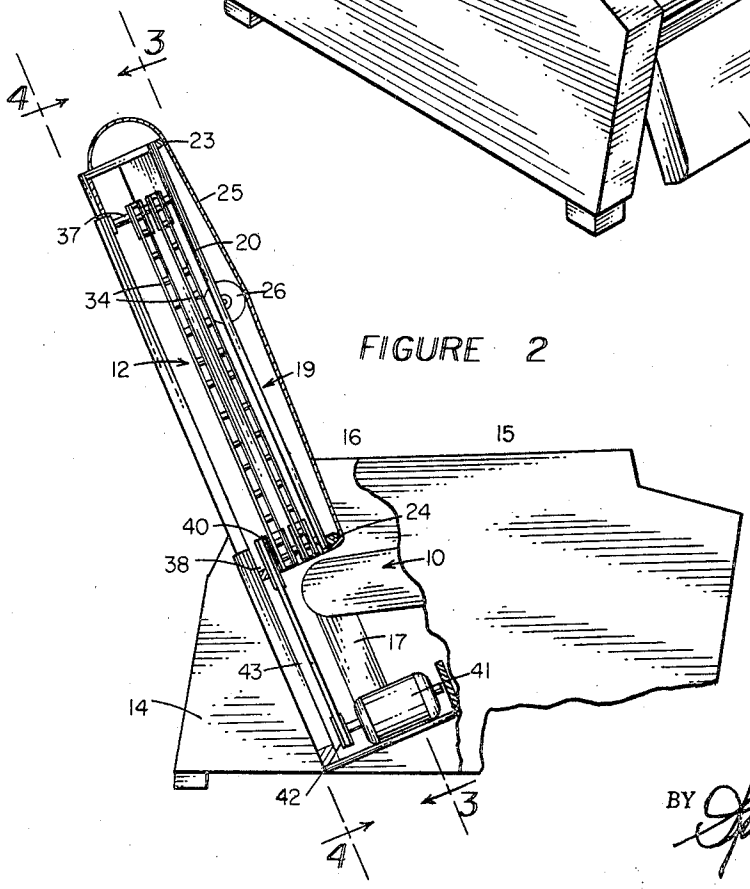


FIGURE 2



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FIGURE 3

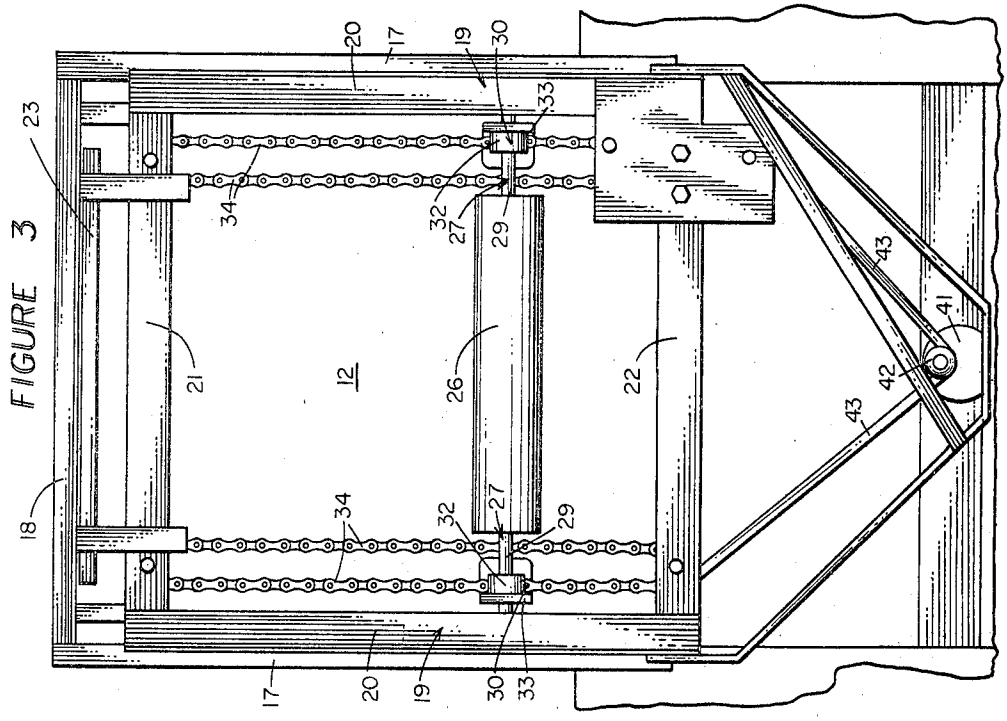
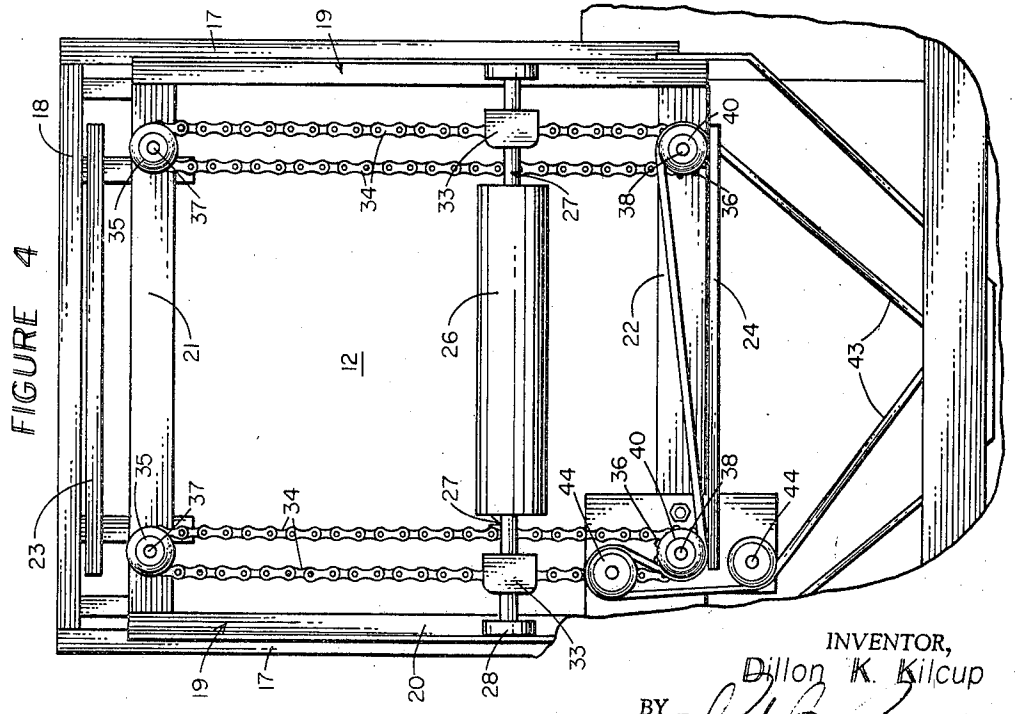


FIGURE 4



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FIGURE 5

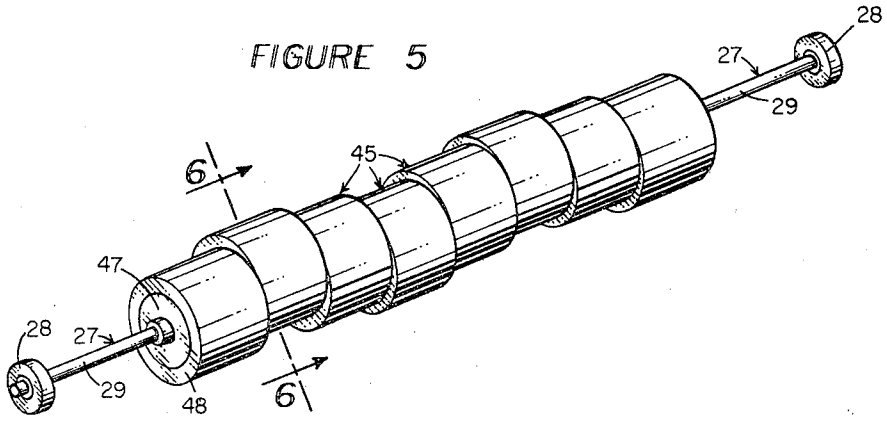


FIGURE 6

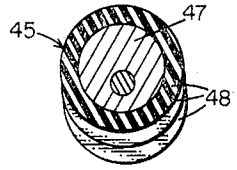
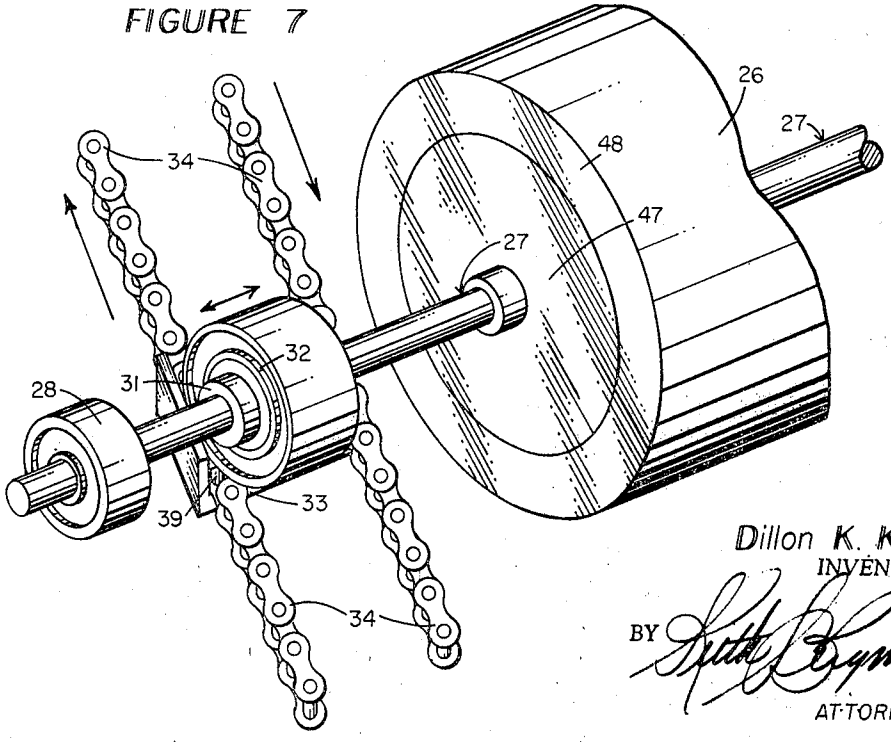


FIGURE 7



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3,480,007

ROLLER BACK CHAIR

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U.S. Cl. 128—58 4 Claims

ABSTRACT OF THE DISCLOSURE

An upholstered chair embodying a roller mechanism to cyclicly move an elongate roller up and down within the chair back structure to massage the back of a user. The roller mechanism embodies an endless chair drive always moving in one direction. The roller mechanism may be embodied in chairs of ordinary commerce. A specie of compound roller with eccentric massaging elements is disclosed.

My invention relates generally to a chain having a roller movable along its back and more particularly to apparatus for accomplishing this motion of a roller by use of an endless chain driving linkage.

Heretofore it appeared desirable to provide a chair, particularly of the overstuffed variety, with some means of providing pleasurable massaging sensations for a user of a chair and in response to this desire various chairs accomplishing this objective have become known.

Such chairs have evolved in two classes, firstly those using a vibrator massager of one sort or another, and secondly those using a roller or other similar massaging device moving over a regulated course. Chairs of the first class have become well known in the art, but chairs of the second class, although known, have not become particularly popular. This lack of popularity has resulted from lack of an appropriate mechanical motion of reasonable cost and durability, to provide the desired motion and in lack of such a motion that causes pleasurable sensations in a user comparable with those provided by the vibratory type mechanism. With these throughs in mind, the instant invention was conceived. In so doing it is:

A principal object of my invention to provide a chair having a roller member movable cyclicly up and down along its back by an endless chain-type driving means.

A further object of my invention to provide a device of the nature aforesaid that has rotatably mounted roller massage member that rotates during lineal motion along the chair back to minimize frictional contact between roller and chair cover.

A further object of my invention to provide a device of the nature aforesaid wherein the massaging roller may be of a compound, eccentric nature to provide a more pleasant massage than caused by a unitary cylindrical roller.

A still further object of my invention to provide a device of the nature aforesaid that is adaptable to be installed as an addition within the framework of an ordinary upholstered chair of commerce without major modifications thereof.

A still further object of my invention to provide roller motion of a continuous nature up and down a chair back without requiring stoppage and reversal of the mechanism to return the roller.

A still further object of my invention to provide such a roller back chair that is of new and novel design, of simple and economic manufacture, of rugged and durable nature, and otherwise well adapted to the uses for which it is intended.

These and other objects of my invention will become apparent from a consideration of the following specification and the accompanying drawings which form a part of this application. In carrying out the objects of my invention, however, it is to be understood that its essential features are susceptible of change in design and structural arrangement, with only one preferred and practical embodiment being illustrated, as required.

In the accompanying drawings which form a part of this application and wherein like numbers of reference refer to similar parts throughout:

FIGURE 1 is an isometric view of a reclining-type upholstered chair, wherein my invention is embodied.

FIGURE 2 is a partially cutaway, orthographic side view of the chair of FIGURE 1, taken essentially on the line **2—2** thereon, in the direction indicated by the arrows, with covering partially removed to show my invention in place from this aspect.

FIGURE 3 is a front view of the chair of FIGURE 1, with the forward back-covering removed, taken essentially on the line **3—3** of FIGURE 2 in the direction indicated by the arrows thereon, to show the various parts of my invention, their configuration and arrangement, from this aspect.

FIGURE 4 is a rearward view of the same structure taken on a similar plane looking in an opposite direction as indicated by the line **4—4** on FIGURE 2.

FIGURE 5 is an isometric surface view of a species of compound eccentric disk roller particularly adapted to massage the back as it moves.

FIGURE 6 is an orthographic cross-sectional view of FIGURE 5, taken on the line **6—6**, in the direction indicated by the arrows thereon.

FIGURE 7 is a partial, cutaway isometric view of the bearing structure supporting the roller shaft of my invention, showing the details of construction and communication between bearing and roller chain.

Referring now to the drawing in more detail and particularly to that of FIGURE 1, there is seen an ordinary upholstered foot-rest chair of commerce including seat **10** with movable foot-rest **11** intercommunicating for joint motion with back **12**, supported between right side **13** and left side **14**, each respectively terminating in right armrest **15** and left armrest **16**. Chairs of this nature commonly have a mechanical linkage between back **12** and footrest **11** requiring the footrest to extend forwardly and upwardly upon motion of the back downwardly and rearwardly. This chair feature is desirable though not essential to my invention. Such chairs are commonly constructed with padding and external upholstery over and about an internal peripheral-type frame generally defining chambers in the interior of the several chair parts.

The back member of such chair is formed with similar upright paired opposed side member **17** structurally joined by at least one cross member **18** at the top, all such members defining an interior void within the back **12**. This void is necessary for installation and operation of my invention in such a chair.

Supporting my invention proper is secondary peripheral frame **19** formed from paired opposed L shaped track sides **20** joined by top cross support **21** and bottom cross support **22**. The sizing of this member is such as to fit immediately within the said inner surface of the peripheral chair back frame and the member is structurally fastened in this position, preferably by releasable means such as screwing or bolting.

Top cross support **21** is provided with U shaped, forwardly projecting upper backing bar **23** and the lower

back frame is provided with a similar lower backing bar **24**, each bar projecting forwardly to substantially the plane of the finished upholstered surface of the chair back. Elongate sheet-like canvas backing member **25** communicates between these bars to provide a surface for roller **26** to roll against.

Roller **26** is carried on axially aligned roller shaft **27**, preferably irrotatably but not necessarily so. Shaft **27** is of such length as to just fit horizontally within secondary peripheral frame **19** and is provided in its lateral extensions with rotatably mounted guide wheels **28**. These guide wheels **28** are provided with appropriate lateral motion limiting devices to maintain them in a position for substantially vertical motion along the inwardly projecting flange of side track **20**. The lateral extension of roller **26** is such as to leave the portions **29** of shaft **27** unoccupied for appropriate lateral motion of bearings **30** therealong.

The bearings are compound, as best illustrated in the detailed view of FIGURE 7 of the accompanying drawings. Each bearing has inner race **31** journaling shaft **27** for rotation and outer race **32** communicating by yoke **33** to pins of the driving chains **34**; inner race **31** is provided for sliding lateral motion along shaft **27** between roller **26** and wheels **28**.

Paired similar, endless, roller link chains **34** are carried in the lateral part of secondary frame **19** by upper idler cogs **35** and lower driving cogs **36**, each cog being irrotatably carried upon jack shafts **37**, **38** rotatably supported by cross members **21**, **22** respectively. Cogs **35**, **36** are so sized and positioned that the course of travel of chains **34** falls laterally within the vertical path described by motion of laterally medial parts **29** of shaft **27** when it moves the chain back. Yoke **33** communicates by pins **39** with chains **34** so that bearing **30** will of necessity move upwardly and downwardly in alternate cycles in response to lineal motion of chain **34** in one direction. The sliding of bearing **30** on shaft **27** is obviously necessary to accommodate this motion.

Jack shafts **38** also irrotatably carry motor belt pulleys **40**. Driving motor **41** is positioned in the lower portion of the seat section chamber of the chair with its driving pulley **42** projecting rearwardly, substantially coplanar with the motor belt pulley **40**. Endless driving belt **43** communicates between motor driving pulley **42** and pulleys **40** to cause the rotation of jack shafts **38**. Preferably adjustable idler pulleys **44** are provided in the course of belt **43**, as illustrated, to keep the belt taut and in proper course.

Since there may be some slight difference in length of chains **34**, from original structure or wear, and since if there be such difference, its effect on roller motion would be additive, it is desirable to provide an appropriate correction for this condition. A simple method of doing this is to rotatably mount one of the driving cogs **36** on shaft **38** so that only one side of the chain drives the roller.

The form of roller illustrated in FIGURES 4 and 7 is a unitary structure with central core **47** and preferably padded periphery **48** adapted to rotate as a unit. A modified form of roller structure which oftentimes gives a more pleasurable massage sensation is shown in FIGURES 5 and 6. This compound roller has a plurality of cylindrical disks **45** rotatably mounted upon shaft **27** slightly non-symmetrically or eccentrically. These disks **45** may be formed of solid rigid material or may carry a peripheral padding as desired. With this composite structure, as the massaging cylinder moves lineally at least a part of the periphery of some of the disks **45** will come into surface contact with the inner surface of canvas member **25** and because of the relative motion between the members at the point of contact a rotation of some of disks **45** upon shaft **27** will occur. This motion will obviously be relatively random, depending upon conditions of contact, but will tend to cause an irregular motion of the surface of the disks **45** to cause a pleasurable massaging sensation somewhat similar to that normally experienced by a hand massage. Obviously, neither type of roller would change the function of this member in my invention.

From the foreging description of my invention, its operation may readily be understood. The mechanism is formed as specified, installed in a chair as described and power provided for its operation. The chair is adjusted to the appropriate position desired by the operator, the mechanism turned on and the subject seated in the chair. The roller **26** then will proceed in its normal cyclic course upwardly and downwardly against the back of the subject to cause a pleasurable massage sensation.

Since the chair back may normally be rearwardly inclined, the degree of force of operator's back against roller may be by this means regulated. The use of a footrest also effects this force to some degree by changing the body muscular tension and position relative the chair.

It is to be noted that in using my invention the roller continuously follows about its regulated course up and down the chair back without any stoppage or reversal of its motion to accomplish this course.

It is further to be noted that the invention may be installed in an ordinary commercial chair without major structural modification.

The foregoing description of my invention is necessarily of a detailed specific nature so that a specific embodiment of it may be set forth as required, but it is to be understood that various modifications, rearrangement and multiplication of parts may be resorted to without departing from its spirit, essence or scope.

Having thusly described my invention, what I desire to protect by Letters Patent, and

What I claim is:

1. An auxiliary roller structure adapted for use as a massaging element in a chair back having a peripheral frame and a central chamber, including, in combination:

a secondary roller frame adapted to fit the peripheral back frame of said chair;

a roller carried on a roller shaft by said secondary frame for oscillatory vertical movement therealong up and down the back of said chair;

at least one endless flexible motion transmitter carried for linear motion parallel to the course of travel of said roller and at a spaced distance therefrom by paired cogs positioned at the vertical limits of said motion;

bearings, journaling said roller shaft for rotation being slidable therealong, structurally communicating with aforesaid flexible power transmitter; and

means of providing linear motion to said roller chain.

2. The invention of claim **1** wherein said roller is further characterized by:

plural, individual cylindrical elements each eccentrically, rotatably carried on said roller shaft.

3. A roller back chair of the nature aforesaid, comprising, in combination:

a chair having a peripheral frame defining a central chamber at least in the back member thereof;

a secondary roller frame within the peripheral frame of the back of said chair including paired opposed side tracks structurally positioned relative said back peripheral frame to extend upwardly substantially parallel therealong;

an elongate roller carried on a roller shaft with paired, laterally positioned wheels adapted to move vertically along said side tracks;

bearings between said wheels and said roller, journaling said roller shaft for rotation, said bearings adapted to slide lineally along the laterally outward parts of said roller shaft;

at least one endless flexible power transmitter provided for vertical motion parallel to and at a spaced distance from the course of travel of said roller by

paired opposed cogs at the vertical limits of motion of the said bearings, said cogs being carried by said secondary roller frame; and

means of moving aforesaid flexible power transmitter continuously along aforesaid course, to cyclicly move said roller upwardly and downwardly along secondary roller frame.

4. The invention of claim 3 further characterized by: said roller comprising a plurality of individual cylin-

drical elements each eccentrically, rotatably mounted on said roller shaft.

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L. W. TRAPP, Primary Examiner