July 15, 1969 L. W. SECOR ETAL 3,455,600

ROCKING WHEEL CHAIR

Filed Feb. 5, 1968 2 Sheets-Sheet 1

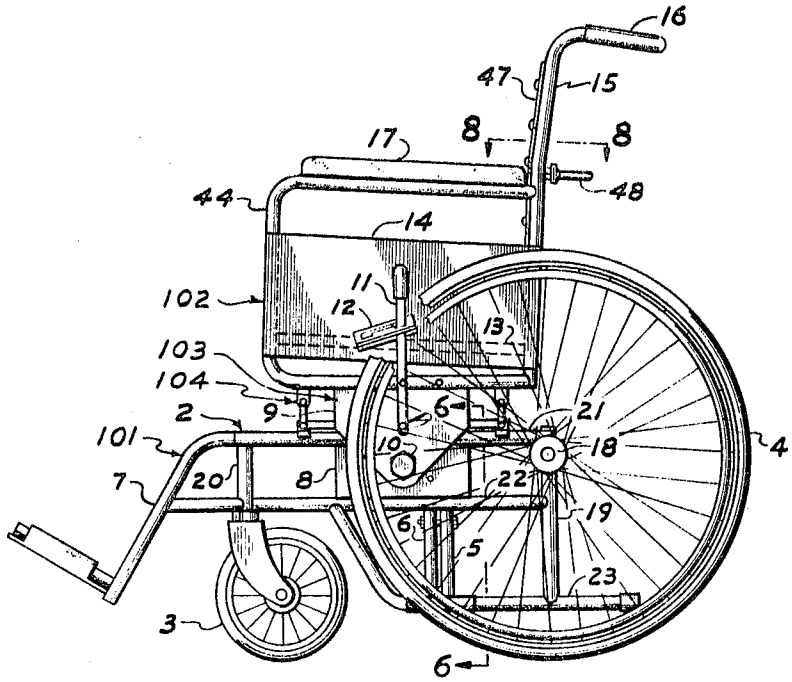


FIG. 1

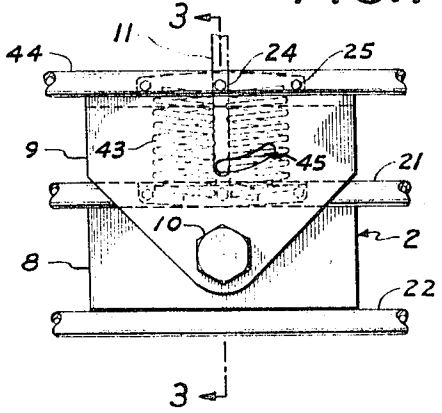


FIG. 2

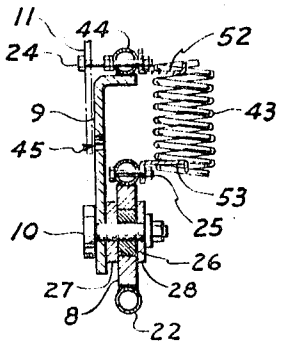


FIG. 3

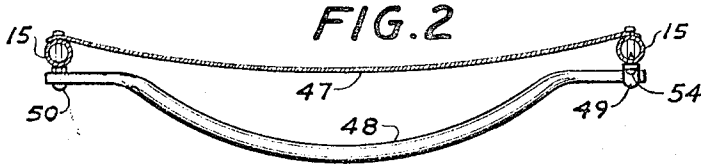


FIG. 8

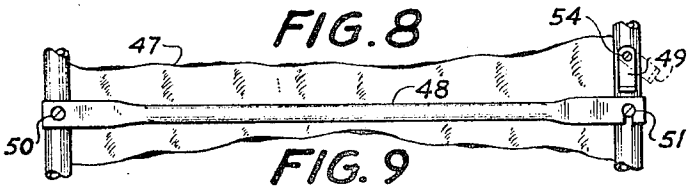


FIG. 9

INVENTORS.
LEWIS W. SECOR
ALICE E. SECOR

BY Harvey J. Lumbert
ATTY.

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ROCKING WHEEL CHAIR

Filed Feb. 5, 1968 2 Sheets-Sheet 2

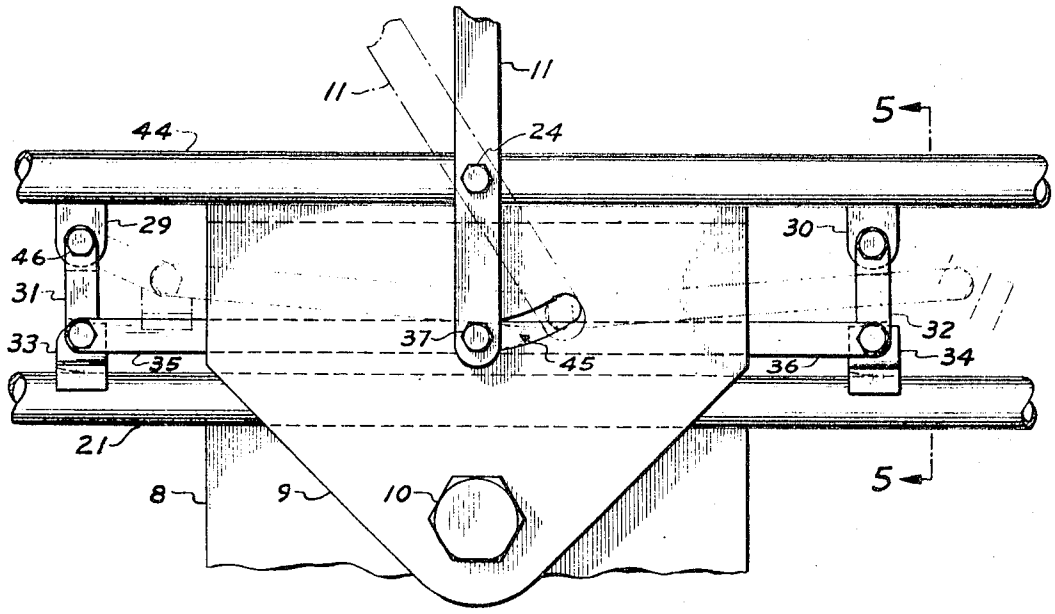


FIG. 4

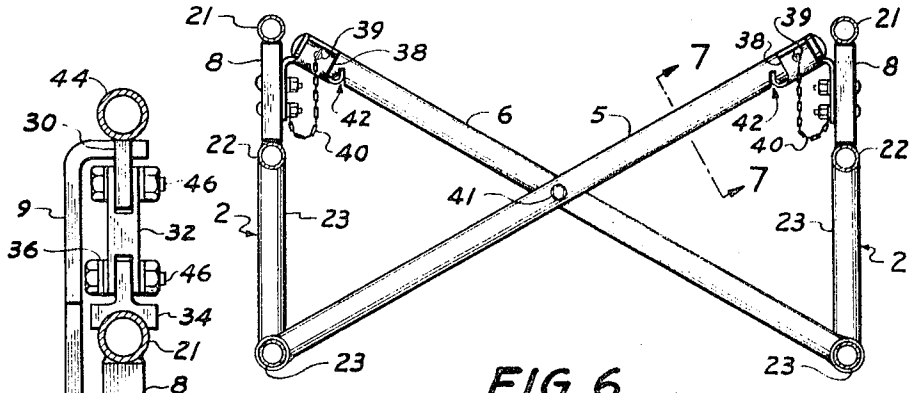


FIG. 5

FIG. 6

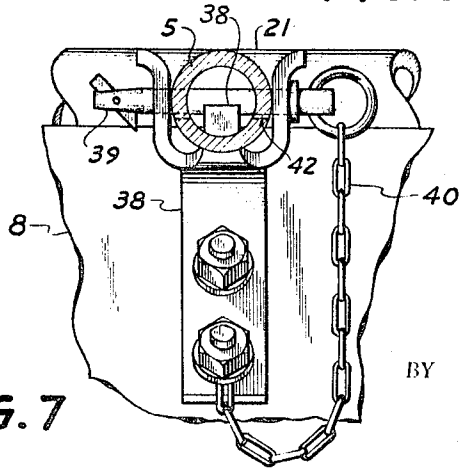


FIG. 7

INVENTORS.
LEWIS W. SECOR
ALICE E. SECOR

BY

Harvey J. Lockhart
Atty.

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3,455,600

ROCKING WHEEL CHAIR

Lewis W. Secor and Alice E. Secor, Los Altos, Calif.
(both of 722-D E. Olive Ave., Burbank, Calif. 91501)

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Int. Cl. A47c 4/28, 3/02
U.S. Cl. 297—45 9 Claims

ABSTRACT OF THE DISCLOSURE

A wheel chair having a rocking mechanism and a stability inducing locking mechanism selectively operable by the occupant.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to an improved wheel chair for invalids and, more particularly, to a wheel chair having a stable mode and a rocking mode selectively available to the wheel chair occupant.

The general therapeutic effects of rocking motion are well known. The shifting of weight in the action of rocking provides gentle exercise, assists circulation and reduces fatigue experienced by individuals confined to wheel chairs. Rocking provides about half the exercise of walking or cycling and which, because of its duration, can result in substantial total muscular exercise beneficial to nonambulatory individuals.

Description of the prior art

Conventional wheel chairs have the seat rigidity attached to the base frame so that no rocking is possible. Accordingly, with conventional wheel chairs, an individual must dismount from the wheel chair and transfer to a rocking chair or attach auxiliary apparatus to the wheel chair in order to enjoy the relaxation, recreation and physical therapy of rocking.

The only wheel chairs, which include a rocking feature, known to us are disclosed in U.S. Patent 3,167,350 in which a pair of spring centered opposed arcuate surfaces are provided and which therefore does not provide true rocking motion, and U.S. Patent 3,306,660 in which a rocking channel is placed under the wheels and which is insecure and not wheeled when on the channel.

SUMMARY OF THE INVENTION

The desirability of a chair which may be wheeled about while in a stable mode in a conventional manner, placed in a rocking mode for use as a rocking chair and then returned to the original stable mode by the nonambulatory occupant while remaining seated and without assistance has been well established. It is additionally apparent that such a chair should be safe, simple, reliable and adaptable for folding and manufacture by existing practices. It is consequently a general object of the present invention to provide a unitized apparatus constituting a rocking wheel chair.

Another object is to enable a nonambulatory occupant to singularly and unaidedly convert a wheel chair into a rocking chair while at all times remaining seated in the chair.

A further object is to provide a rocking wheel chair which is foldable for ease in transportation and to conserve space in storage.

Still another object is to provide menas for attaining the foregoing objectives while securing complete safety for the individual in the wheel chair.

Briefly, in accordance with the present invention, there is provided a wheeled base frame, a body supporting chair

including a seat and a back portion, a spring centered rocking mechanism interconnecting the chair and the frame and a locking means for stabilizing the chair upon the frame.

Other objects and advantages of the invention will become readily apparent from the following detailed description of a preferred embodiment of the invention when read in connection with the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a left side elevational view of a rocking wheel chair constructed in accordance with the present invention, the chair being shown in the stable mode;

FIG. 2 is an enlarged fragmentary side elevational view of the rocking mechanism;

FIG. 3 is a vertical sectional view of the rocking mechanism taken on lines 3—3 of FIG. 2;

FIG. 4 is an enlarged fragmentary side elevational view of the locking mechanism;

FIG. 5 is a vertical sectional view of the locking mechanism taken on lines 5—5 of FIG. 4;

FIG. 6 is an enlarged fragmentary rear elevational view of FIG. 1 taken on lines 6—6 illustrating the transverse strut arrangement between base frame members;

FIG. 7 is an enlarged rotated fragmentary sectional view taken on lines 7—7 of FIG. 6;

FIG. 8 is an enlarged rotated sectional view through the backrest and its supports on lines 8—8 in FIG. 1; and

FIG. 9 is a fragmentary rear elevational view of the backrest and its supports illustrated in FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the figures in which like reference characters designate like parts, and particularly to FIG. 1, there is shown an invalid wheel chair embodying the features of the invention which comprises a wheeled base frame **101** carrying a body supporting chair **102** mounted thereto by a rocking mechanism **103** and a locking mechanism **104** for locking chair **102** to base frame **101** to form a rigid assembly thus preventing relative movement between the chair and the base frame.

Wheeled base frame **101** has a pair of spaced apart vertical frame members, one of which is designated generally **2**, which are identical in construction so that a description of one covers both. Each frame member has parallel spaced horizontally extending upper and center longitudinal members **21** and **22**, and a lower frame section **23** structurally joined by a vertical rear post **19** and a vertical caster post **20**. The rear post **19** carries an axle **18** with a horizontal axis upon which is rotatably mounted a relatively large driving wheel **4**. A swiveling caster wheel **3** is mounted to the caster post **20** and with the driving wheel **4** provides rolling support for the base frame. Frame member **2** is further provided with a foot and/or leg rest assembly generally indicated at **7**.

As best seen in FIG. 2, a bearing support block **8** is interposed between and secured to the upper and center longitudinal members **21** and **22** as indicated. Bearing support block **8** provides the main structural element through which loads of chair **102** and its occupant are transferred to the base frame **101**. Bearing support block **8** is also used in the foldable connective structure between the frame members as described below.

Opposite vertical frame members **2** are connected, as best illustrated in FIG. 6, one to the other by means of a pair of diagonal transverse struts **5** and **6**. Each strut is pivotally connected at its lower end to the lower frame section **23** of a frame member. Transverse struts **5** and **6** are connected together intermediate the ends thereof by

means of a pivot such as bolt **41** extended through aligned openings in each strut. As best seen in FIG. 7, strut support brackets **38**, configured to accept the upper ends of the transverse struts, are affixed to the bearing support block **8** of the frame member. The upper ends of each transverse strut are provided with a notch **42** located to accept a bent tang portion of strut support brackets **38**.

As best seen in FIG. 7, safety lock pins **39** passing through aligned openings of the transverse struts **5** and **6** and the support brackets **38** provide positive attachment thereof. Chain lanyards **40** are provided to secure safety lock pins **39** to the strut support brackets to prevent their loss.

Body supporting chair **102**, as best seen in FIG. 1, has a spaced apart pair of side frames **44** which are substantially in alignment with one another. Each side frame is provided with a side panel **14**, an arm rest **17** and the terminal end of a vertically extending back support **15** to which is secured a flexible fabric backrest **47**. The upper portion of upstanding back support **15** has a horizontally extending section adapted to receive a hand grip **16**. Interposed between the pair of parallel spaced side frames **44** is a foldable solid or hammock seat **13**.

As best seen in FIGS. 8 and 9, a spreader bar **48** is disposed across vertical back supports **15**, **15** to maintain the lateral spacing thereof. Spreader bar **48** is pivotally mounted to one vertical back support **15** by a pivot bolt **50** and is secured to the opposing back support by a notch therein which engages a standoff screw **51** as indicated. A lock clip **49** is pivotally mounted to the back support by a pivot bolt **54**. Lock clip **49** in a normally gravity depended latch will prevent disengagement of standoff screw **51** and the spreader bar. To remove spreader bar **48** upon folding the wheel chair, lock clip **49** is rotated about pivot bolt **54**, spreader bar **48** is lifted disengaging it from standoff screw **51** and vertical back supports **15**, **15** are thus free to move toward each other as fabric backrest **47** and foldable seat **13** fold.

The spring centered rocking mechanism **103** disposed between wheeled base frame **101** and body supporting chair **102** is best illustrated and understood by referring to FIGS. 2 and 3. Rocking mechanism **103** includes brackets and pivots by which the side frames **44** of chair **102** are rotatably affixed to frame members **2** of base frame **101** and a spring means resiliently biasing rotational motion about a neutral position. The primary structural element of the rocking mechanism is a support bracket **9** affixed to side frame **44** of the chair and pivotally supported on base frame member **2** through a pivot bolt **10**. Pivot bolt **10** is rotatably attached to the base frame member through a bearing **26** in support block **8**. A spacer **27** and bearing retainer **28** are provided to assure interference free movement of support bracket **9** with respect to base frame member **2**.

The chair is stabilized in a neutral rotational position by a pair of springs **43** connected between side frame **44** of the chair and frame member **2** of the base frame. Springs **43** are interposed between side frame **44** and base frame member **2** on either side of pivot bolt **10**. Brackets **52** and **53** secure the upper and lower end portions of springs **43** to side frame **44** and upper longitudinal member **21**, respectively. Springs **43** react in opposite rotational sense to each other and resiliently bias the rocking movement of the chair about the pivot bolt **10** in a neutral position.

A controlled locking mechanism **104** for selectively preventing rocking motion of body supporting chair **102** relative to wheeled base frame **101** is illustrated in FIGS. 4 and 5. More specifically, a lever manipulated four-bar linkage is provided which interjects and removes rigid elements between the base frame member and the chair. An upstanding operating lever **11** is pivotally mounted by extended bolt **24** on one side of frame **44** of the chair. The upper portion of lever **11** is engageable by a slotted bracket **12** affixed to the side panel **14** of the chair which limits pivotal movement of the lever and locks the lever in either extreme of its movement. A linkage engaging pin **37** extends laterally from the lower extremity of lever **11** and passes through an arcuate clearance slot **45** in the support bracket **9**. Linkage engaging pin **37** describes an arcuate path as lever **11** is pivotally moved about the bolt **24**. Pin **37** moves two connecting rods **35** and **36** attached thereto during its arcuate movement thereby effecting pivotal movement of clevis links **31** and **32** about clevis bolts **46** by which the clevis links are rotatably attached to lugs **29** and **30** secured to the chair side frame **44** as indicated. Shoes **33** and **34** are pivotally attached to clevis links **31** and **32** and include surfaces which mate with and cooperatively engage upper longitudinal member **21** of frame member **2**.

Lugs **29** and **30**, clevis links **31** and **32** and shoes **33** and **34** of the locking mechanism, when in mutual alignment as illustrated by the solid lines of FIGS. 4 and 5, constitute a rigid connection between base frame **101** and chair **102** and prevents any rotational movement of the chair relative to the base frame. Counterclockwise rotation of operating lever **11** and consequent movement of the clevis links and shoes, as indicated by the phantom lines in FIG. 4, removes the constraint and allows rotational or rocking movement of the chair relative to the base frame.

The rocking wheel chair is folded by moving parallel chair side frames **44** and base frame members **2** together. Foldable characteristics of the rocking wheel chair are provided by the independent assembly of base frame member **2**, chair side frame **44** and rocking and locking mechanisms **103** and **104** on each side of the wheel chair. A firm safe foldable rocking wheel chair is provided by the securely attached, though disengageable, transverse struts **5** and **6** and spreader bar **48**. The body supporting seat **13** and backrest **47** also disposed between the side frame assemblies are flexible and/or foldable and do not mitigate against folding action of the structure.

In its open or occupiable form, base frame member **2** with attached chair side frames **4** are maintained in parallel spaced relationship by the transverse struts **5** and **6** which are secured to corresponding support brackets **38** by the safety pins **39** as illustrated in FIG. 6. Additionally, lateral spacing of back supports **15**, **15** is assured by optional spreader bar **48** disposed thereacross as illustrated in FIG. 9.

To fold the rocking wheel chair, the constraint on the lateral spacing of the back supports **15**, **15** is removed by rotating the lock cllip **49** from its downwardly depending position and lifting optional spreader bar **48** thereby disengaging it from standoff screw **51**. Transverse struts **5** and **6** are similarly disengaged from brackets **38** by removal of safety lock pins **39**. The disengaged struts are then free to pivot on lower frame sections **23**, **23** and each other at pivot bolt **41** as base frames **2**, **2** are brought together. Reversal of folding and locking procedure will, of course, return the foldable rocking wheel chair into a condition to receive an occupant.

It will be understood that the structural assembly of the wheel chair is preferably formed of tubular metal stock and is secured together by welding. However, other types of construction may be employed with equally satisfactory results.

Whereas certain operative forms of the invention have been shown and described, it should be understood that this description should be taken in an illustrative or diagrammatic sense only.

What is claimed is:

1. A rocking wheel chair comprising:

a wheeled base frame;

a chair including a seat and a backrest;

a rocking means, said rocking means including

a pivot means for pivotally connecting said chair to said base frame to allow said chair to execute a rocking motion about a pivot axis fixed with respect to said frame, and

a spring means interconnecting said chair and

said base frame for resiliently biasing said chair about a neutral position.

2. A rocking wheel chair in accordance with claim 1 which further includes:

a controllable locking means for selectively and operationally enabling and disabling said pivot means.

3. A rocking wheel chair in accordance with claim 2 in which said locking means includes a lever actuated linkage selectively interposing rigid members between said base frame and said chair on either side of said pivot means for preventing rocking motion therebetween.

4. A rocking wheel chair in accordance with claim 1 in which said chair and said base frame include side frame members which are movable between a spaced apart and a folded position, said wheel chair further including a means to lock at least the side frame members of said base frame in said spaced apart position.

5. A rocking wheel chair comprising:

a base frame including a pair of frame members movable between a spaced apart and a folded position, ground engaging wheel means rotatably mounted to said frame members, and diagonal transverse struts pivotally connected to and extending between said frame members, said struts including means for securing said frame members in at least said spaced apart position;

a chair having a pair of side frames also movable between a spaced apart and a folded position, and a foldable seat and backrest extending between said side frames; and

rocking means for connecting each said side frame to one of said frame members, said rocking means including a pivot means for pivotally connecting each side frame to a frame member, and a spring means for biasing at least one of said side frames to the frame member to which it is connected about a neutral position.

6. A rocking wheel chair in accordance with claim 5 which further includes:

a controllable locking means for selectively locking and unlocking said chair to said base frame, said locking means including a lever actuated linkage selectively interposing rigid members between at least one of said side frames and the frame member to which it is connected for preventing motion therebetween.

7. A rocking wheel chair in accordance with claim 6 which further includes a spreader bar for lockingly interconnecting said pair of side frames in the spread apart position.

8. A rocking wheel chair in accordance with claim 7 in which said spreader bar is pivotally attached to one of said side frames and selectively securable to other said side frame in the spread apart position.

9. A rocking wheel chair in accordance with claim 5 in which each said frame member has a lower frame section, each said strut has a lower and an upper end, said lower ends being pivotally connected to said lower frame sections, said struts pivotally connected to each other intermediate the ends thereof, and said upper ends selectively securable to said frame members to constitute a cross-brace structure joining said frame members in said spaced apart position.

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DONALD A. GRIFFIN, Primary Examiner

U.S. Cl. X.R.

297—270