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FOLDABLE CHAIR

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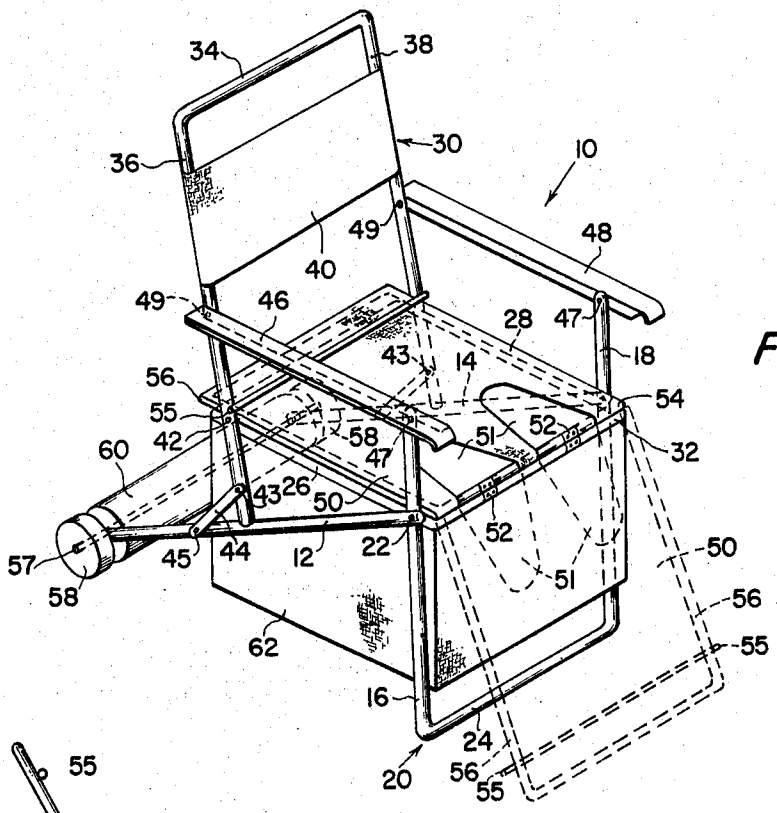


FIG. 1

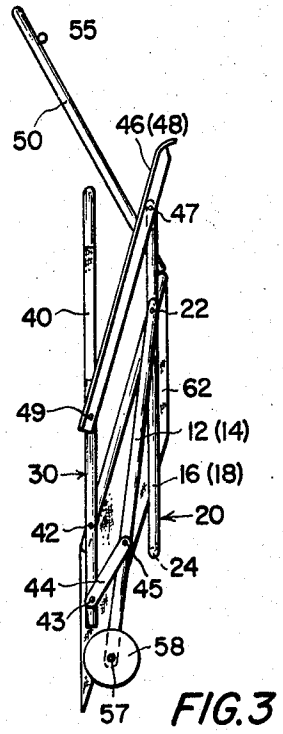


FIG. 3

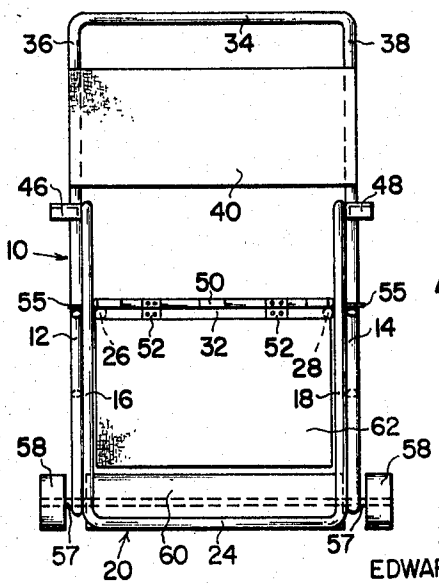


FIG. 2

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FOLDABLE CHAIR

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This invention relates generally to a foldable chair and more particularly to a foldable chair which is adapted to transport objects and persons easily across a sandy or similar irregular terrain.

Folding chairs which may be opened to provide a seat for a person or which may be folded flat for storage or carrying purposes have been known in the past. Such chairs have found widespread use in recreational areas such as beaches, because the chairs may be easily packed away in a car trunk when they are folded to a closed position. A number of such foldable chairs, as that shown in Patent No. 2,587,176, issued to Larson, also have been provided with wheels to facilitate their movement from place to place. However, a problem is encountered when it is desired to transport such a chair across a sandy or irregular soft terrain, particularly when the chair is in the open position and is carrying objects and persons such as a child, and/or articles for use on the beach. That is, the wheels provide small contact surface areas between the sand and the chair; hence the wheels tend to "dig" into the sand, impeding and at times preventing the movement of the chair through the sand.

Accordingly, an object of the present invention is to provide a foldable chair which is adapted to be transported by rolling easily across a sandy or other soft and irregular terrain.

Another object of the present invention is to provide a foldable chair that can be used as a chair and also as a vehicle in which a child and/or articles may be moved easily over rough, soft terrain. Accordingly, a feature of the invention resides in the provision of a storage device beneath the seat of the chair for receiving and containing articles for storage therein.

A further object of the present invention is to provide a foldable chair which is sturdy and is adapted to support relatively heavy loads when in the open position and which occupies a minimum of space when it is in the folded position.

Many types of foldable chairs, such as the chair illustrated in the aforementioned patent to Larson, are provided with mechanical locks for preventing the collapse of the chair when it is in the open position. However, it has been found that such locks are subject to accidental disengagement due to, for example, vibrations arising from the movement of the chair or from eccentrically applied forces.

Thus, still another object of the present invention is to provide a foldable chair which includes means for positively locking the chair in the open or seating position.

Still a further object of the present invention is to provide a foldable chair which is easy to manufacture and which is economical to produce.

Other and further objects of this invention reside in the structures and arrangements hereinafter more fully described with reference to the accompanying drawing in which:

FIG. 1 is a perspective view of a foldable chair constructed according to the invention and shown in the open position,

FIG. 2 is a front elevational view of the foldable chair shown in FIG. 1, and

FIG. 3 is a side elevation of the foldable chair constructed in accordance with the present invention shown in the folded position.

The foldable chair of the present invention is illustrated in the open position in FIG. 1 and is designated

generally by the numeral **10**. The chair **10** includes a structure having a pair of spaced parallel downwardly inclined rearwardly directed bars **12** and **14**. A pair of spaced, parallel legs **16** and **18** that are directed at a slight angle to the vertical in the seating position of FIG. 1, are part of a U-shaped front leg structure **20**. Each leg **16** and **18** is respectively connected to a different one of the rearwardly directed bars **12** and **14** to provide front or fore legs which support the chair.

A pivot pin **22** extends through the bar **12** adjacent the front end thereof and connects the same to the leg **16** at a point spaced down from the top edge thereof. A similar pivot pin (not shown) connects the bar **14** to the leg **18** so that the member **20** is pivotable with respect to the bars **12** and **14** of the chair **10**. As shown in FIGS. 1 and 2, the base portion **24** of the member **20** is adapted to rest on the ground when the chair is in the open position.

A pair of spaced parallel transverse members **26** and **28** are positioned interiorly of the legs **16** and **18**. Each member **26** and **28** is pivotally connected, back of their forward end, to a respective leg **16** and **18** by the pivots **22**. Thus, the pivot pins **22** also pivotally connect the the transverse members **26** and **28** to the bars **12** and **14** respectively at a point spaced from the front ends thereof. These connections are also made intermediate the lengths of the legs **16** and **18**. A longitudinally extending member **32** is connected between the forward projecting ends of the transverse members **26** and **28** in any conventional manner, and in conjunction with the transverse members, provides a seat frame support and a means by which a back rest structure **30** may move relative to the front leg structure **20**.

The back rest structure **30** of the chair **10** is an inverted U-shaped member including a top **34** merging with downwardly directed spaced parallel legs **36** and **38**. A rectangular piece of fabric **40**, which is positioned below the bight of the top member **34**, extends between the legs **36** and **38** and provides a back rest for the person sitting in the chair **10**. Similar pivot pins **42** connect the legs **36** and **38** at points spaced below, and intermediate their ends, to the back ends of the transverse members **26** and **28** respectively. In this way, the back rest structure **30** is pivotable with respect to the members **26** and **28** and to the front leg structure **20**.

In the open position of the chair **10**, the bottom edges of the legs **36** and **38** abut and rest upon the respective upper surfaces or edges of the bars **12** and **14**, so that the back rest structure **30** is slightly inclined upwardly and rearwardly, as shown in FIG. 1. The back rest structure **30** is supported on the bars **12** and **14** and so positioned by a pair of toggle links **44**. One link **44** is pivotally connected between the leg **36** and bar **12** at **43** and **45** respectively. Another similar link arrangement **44** is provided between the bar **14** and leg **38** so that the back rest structure **30** may have an over-the-center limited movement with respect to the rearwardly directed support bars **12** and **14**.

A pair of spaced, substantially coplanar arm rests **46** and **48** are pivotably connected to a respective one of the front and rear legs. Each arm rest **46** and **48** is provided with a respective depending flange through which a separate pivot pin **47** extends and connects the front end of each arm rest to the tops of the respective legs **16** and **18**. A pin **49** connects the rear end of each arm rest **46** and **48** to a respective one of the legs **36** and **38**. Thus, the tops of the front legs **16** and **18** are connected with respective ones of the rear legs **36** and **38**.

A substantially rectangularly shaped seat frame **50**, that may also be used as a back rest, is pivotally connected at its forward end to the member **32**. This pivotal connection may be accomplished in any convenient conventional manner. In practice, it has been found that the

provision of a plurality of hinges 52 connecting together the crossbar 54 of the frame with the member 32 is sufficient. Hence, the seat frame 50 is able to be pivoted between its normal seating position as shown in solid lines in FIG. 1 and its back rest or open position illustrated in dash lines in FIG. 1. When the seat frame 50 is in its active seating solid line position, it rests on and is supported by the members 26, 28 and 32 of the frame structure of the chair 10. When the seat frame 50 is in its open position (dash line) it may be employed as a back rest by a person sitting on the ground or other surface on which the chair 10 is placed.

In practice, the seat frame 50 is covered with a seating surface of fabric material on which the user of the chair may sit. The fabric seat may be conveniently provided with leg receiving spaced apertures 51 so that the seat 50 may be used as the seat of a buggy or a stroller for a child whose legs may extend downwardly through the spaced leg receiving apertures while the child remains in a sitting position with his back resting against the back rest fabric 40.

Mounted on the seat frame 50 is a lock in the form of a bar 55 that extends between and is connected to the transverse side members 56 of such frame and spaced from the rear or back end thereof. When the seat frame 50 is in its active or seating position as shown in full lines in FIG. 1, the bar extends across the back of the chair 10 and abuts with the forward facing surfaces of the two rear legs 36 and 38 of the back rest 30. Because the front end 54 of the seat frame 50 is hingedly secured at 52 relative to the longitudinal member 32, the bar 55 fits into snug abutting engagement with the legs 36 and 38 and thereby locks such legs from movement relative to the front 20 so as to prevent the chair 10 from pivoting out of its sitting position as shown in full lines in FIG. 1.

When the chair 10 is open and the back rest structure 30 is in its sitting position, the legs 36 and 38 thereof rest on and are supported by the bars 12 and 14 respectively. The link 44 forms an arrangement that prevents the legs 36 and 38 from pivoting out of their abutting relationship with the bars 12 and 14 until such time as the locking bar 55 is lifted out of abutting engagement with the legs 36 and 38. Thus, the cooperation between the locking bar 55 and the legs 36 and 38, and the retained engagement of such legs with the bars 12 and 14 respectively, by virtue of the over-the-center type linkage that is afforded by the links 44, prevents accidental or unwanted closure of the chair 10. The arrangement provided by the links 44 functioning between the legs 36 and 38 and the bars 12 and 14 can only operate or function when the lock 55 is released.

Mounted in aligned bores adjacent the rear ends of the bars 12 and 14 is a continuous longitudinally extending shaft 57. The ends of the shaft 57 extend beyond opposite sides of the bars 12 and 14 and each end mounts a relatively wide wheel 58 for rotation. Mounted on the shaft 57 for rotation is a roller 60 that is positioned interiorly of the bars 12 and 14 and is of such length that it is slightly less than the interior space between such bars. The combination of the wheels 58 and the longitudinally extending roller 60 provide large ground surface contact areas between the chair 10 and the ground so that the chair may be rolled easily over an irregular terrain or surface more especially over soft sandy surfaces without sinking or digging into the same.

Mounted on the chair 10 and extending downward from the seat area thereof is an open topped storage box 62 that may be conveniently formed of a pliable plastic or fabric material. The upper edge of the storage box or compartment 62 is connected in any convenient or well known manner to the transverse members 26 and 28 and to the longitudinal member 32 to depend downward therefrom. Access to the storage compartment or box 62 is afforded through the top thereof by opening the seat frame 50. Thus, when the seat frame 50 is closed in its seating or full line position as shown in FIG. 1, access to the storage compartment is also closed. When the seat frame 50 is lifted or opened to its dash line position as shown in FIG. 1, the top of the storage box is open.

In use, it will be recognized that the chair 10 may be utilized as a beach buggy or stroller. A child may be seated on the seat frame 50 shown in solid lines in FIG. 1 with its legs extending downwardly through the openings provided in such seat. With the child so resting in the chair and on the seat frame, the chair may be grasped at the top bar 34 of the back rest and pulled backwardly over any ground surface. If the ground surface is soft and irregular as is found at a sandy beach, the large rollers 58 and 60 enable the chair to be negotiated over the ground without digging into the sandy surface because the rollers afford large contact areas and, therefore, distribute the weight of the chair over such larger areas. It will be recognized by those skilled in the art that while the chair 10 is moved along the irregular surface, it cannot fold accidentally because the weight of the person or child resting upon the seat frame 50 will retain the bar 55 into locking engagement with the back legs 36 and 38. This prevents the operation of the over-the-center linkage 44. Hence, the legs 36 and 38 remain in non-releasable abutment with their respective supporting bars 12 and 14.

When it is desired to fold the chair 10, the seat frame 50 is lifted upwardly and pivoted at its hinges 52 from its solid line position to substantially its dash line position. The removal of the bar 55 from locking engagement with the back legs 36 and 38 now permits the toggle linkage to operate. Accordingly, the back rest structure 30 and front leg structure 20 move relative to each other at their connecting pivots 22, 42, 43, 45, 47 and 49 allowing the rear legs to be lifted upwardly free of abutting engagement with their respective bars 12 and 14. This upward movement permits the links 44 to lift and enable the whole structure of the chair 10 to fold upward into the position substantilaly as that shown in FIG. 3. When in such condition, the whole of the chair structure 10 forms a compact narrow storable arrangement. The seat frame 50 may now be pivoted upwardly as shown in FIG. 3 or if the hinges 52 permit, the same may drop downward in front of the front leg structure 20.

The foldable storage compartment 62, being of a pliable material, conforms to the narrow compact folded chair. Thus, there is provided a foldable chair that may be utilized as a buggy or vehicle for the movement of people and material across a soft or irregular surface or terrain and which may be easily folded into a compact narrow condition for storage within a limited space. Moreover, the chair 10 is provided with a safety structure which when the seat is in its active seating position positively locks the framework of the chair and prevents the same from accidental closure or folding.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

I claim:

1. In a chair foldable between an open position and a closed position,

a back rest structure,

a front leg structure,

connecting means pivotally connecting said back and front for simultaneous folding movement of said front leg and back rest structures, said connecting means including a seat frame support pivotally connecting said back rest and front leg structures,

a bar structure pivotally connected to said front leg

structure and against which said back rest structure is supported when the chair is in its open position,
a linkage connecting said back rest and said bar structure for movement to and from its position supported by said bar structure,
a seat pivotally mounted on said support frame to and from a seating position,
and means on said seat engaging said back above said seat frame pivotal connection to lock the same from movement to its closed position.

2. In a chair as in claim 1,
a storage compartment on said chair beneath said seat,
said seat being movable from its seating position wherein the same closes said compartment to a back rest position extending forward and downward from said support frame to open said compartment.

3. In a chair as in claim 1,
roller means on said bar structure including an elongated roller element extending for substantially the width of said chair and providing a large contact area along its length with a surface on which the chair is located to enable the chair to be moved over such surface along said roller means, including said elongated roller element.

4. In a chair as in claim 3,
said seat having apertures defined therein to enable the legs of a child seated on said seat to extend downwardly therethrough.

5. In a chair foldable between an open position and a closed position,
a pair of inclined bars,
a pair of front legs,
means pivotally connecting each of said front legs with a respective one of said bars,
a back rest structure, means between said pair of inclined bars and said back rest structure for restraining relative movement therebetween when said chair is in the open position,
a pair of transverse members,
means pivotally connecting each of said transverse members with a respective one of said front legs and with said back rest structure at a first point, means pivotally connecting said pair of front legs and said back rest structure at a second point whereby pivotal movement of said back rest structure relative to said front legs causes said chair to fold,
a seat pivotally connected between said pair of transverse members and being movable on said chair to a seating position when said chair is in its open position,
and lock means on said seat cooperable with said back rest structure above said first point when said seat is in said seating position to prevent the movement of said back rest structure relative to said front legs.

6. In a chair as in claim 5,
said seat resting on said transverse members when in the seating position,
and said lock means including a member having releasable abutting engagement with said back rest structure to prevent relative movement between said back rest structure and front legs.

7. In a chair as in claim 5,
a storage compartment depending from said transverse members and having an open top,
said seat opening and closing the top of said storage compartment when said seat is moved from and to its seating position respectively.

8. In a chair movable between an open position and a closed position,
a pair of rearwardly downwardly inclined bars,
a pair of front legs,
means pivotally connecting respective ones of said legs and bars together,
a back rest structure,
a pair of transverse members,
pivot means pivotally connecting each one of said pair of transverse members to a respective one of said front legs and to said back rest structure,
a pair of operable links each connecting said back with a respective one of said bars,
a pair of arm rests,
each arm rest being pivotally connected to a respective one of said pair of front legs and to said back rest structure,
a longitudinally extending member connected between said transverse members adjacent the front ends thereof,
a seat,
means connecting said seat to said longitudinal member for movement to and from a seating position when the chair is in its open position,
and lock means on said seat engageable with said back rest structure above said pivot means when the seat is in its seating position to prevent the operation of said links and the movement of said back rest structure and front legs relative to each other.

9. A chair as in claim 8,
roller means mounted for rotation relative to and between said pair of bars,
said roller means including an elongated roller element extending between said pair of bars.

10. A chair as in claim 9,
said seat having apertures defined therein for the accommodation of the legs of a person seated thereon.

11. A chair as in claim 9,
a storage compartment connected to and depending downward from said transverse and longitudinally extending members,
said seat closing and opening said storage compartment when the same is moved to and from its seating position respectively.

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