Feb. 7, 1956 R. W. BOUCHER 2,733,755

COLLAPSIBLE FURNITURE

Filed Jan. 4, 1955 2 Sheets-Sheet 1

Fig. 1.

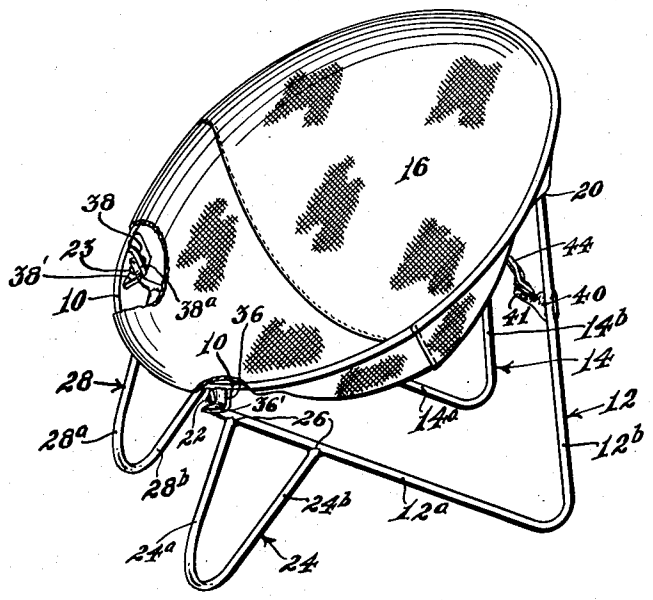
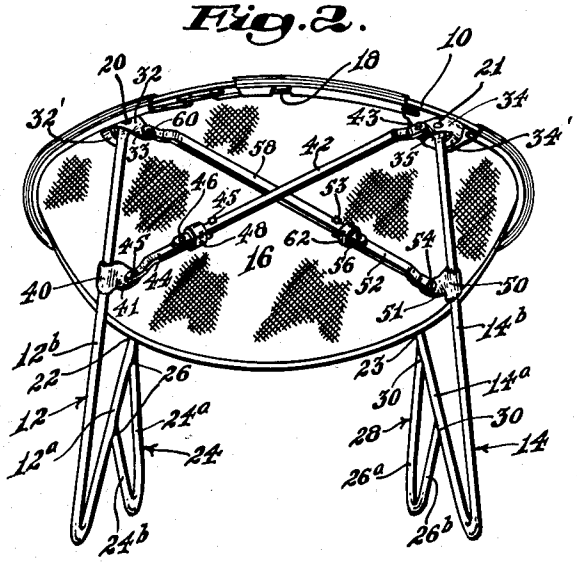


Fig. 2.



Inventor:
Raymond W. Boucher
By John K. McKenna
Attorney

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Filed Jan. 4, 1955 2 Sheets-Sheet 2

Fig. 3.

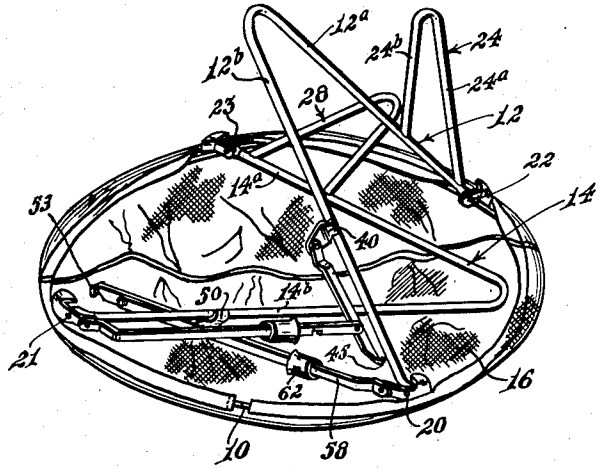


Fig. 4.

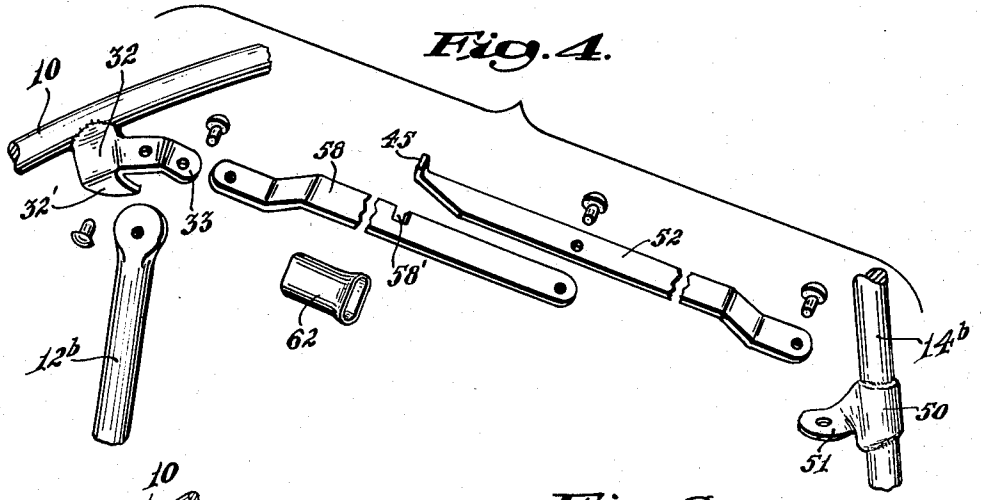
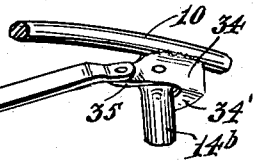


Fig. 6.



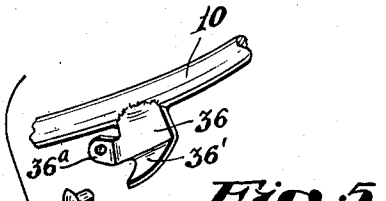
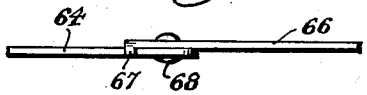


Fig. 5.



Fig. 7.



Inventor:
Raymond W. Boucher
By John H. McKenna
Attorney

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COLLAPSIBLE FURNITURE

Raymond W. Boucher, Dothan, Ala., assignor to Hedstrom Union Company, Fitchburg, Mass., a corporation of Massachusetts

Application January 4, 1955, Serial No. 479,712

4 Claims. (Cl. 155—148)

This invention relates to improvements in collapsible furniture. More particularly it provides an improved collapsible frame structure designed to removably receive a flexible sheet element which, in conjunction with the frame structure, is adapted to serve as a chair, or other item of furniture.

So-called ring chairs have been produced heretofore with rigid frames which have included leg members rigidly connected to and supporting a circular ring of metal which, in turn, supports a generally circular flexible sheet element which constitutes the seat for the chair. Ordinarily, the metal ring is supported in a plane which is substantially inclined with respect to the floor or ground on which the chair leg members may be resting, and the flexible sheet element usually is readily removable from the ring and there is an abundance of the sheet material within the circle of the ring so that, when mounted, the flexible sheet material is in the nature of a relatively shallow bag which, because of the inclination of the ring support, provides a suspended seat which extends upward to support the back of a person sitting in the chair. The prior rigid frames occupy a relatively large space when in use and when stored, and they are awkward and space-consuming when it becomes necessary to ship one chair or a number of the chairs from place to place. Not only are shipping and storing costs unduly high, but it has been difficult and expensive to adequately protect the chairs against damage in the course of shipment.

It is among the objects of the invention to provide ring-type chairs of the mentioned variety having frames which are rigid and strong when set up for use but which readily may be collapsed to a generally flat condition for storing, shipping and handling purposes. According to the invention, leg members each has pivotal connections to a ring support for the flexible sheet material, and abutment means is fixed on the ring at each said pivotal connection constituting a stop against which the adjacent leg member engages when moved about its pivotal connection to its ring-supporting position; there being releasable locking means for holding the leg members against the said stops when the chair frame is set up for use.

Another object of the invention is to provide a chair, or the like, wherein a relatively large-diameter rigid ring supports flexible sheet material within the ring and is itself supported on leg members which are readily foldable substantially into parallelism with the plane of the ring, whereby the chair requires relatively little space when being shipped or stored. The leg members are pivotally connected to the ring and releasable locking means coacts with rigid abutments on the ring to effect a rigid and strong construction when the chair is set up for use.

It is, morever, my purpose and object generally to improve chair constructions and especially ring-type chairs by providing novel features therein whereby they may be collapsed or folded into a compact condition when not in use.

In the accompanying drawings:

Fig. 1 is a perspective view of a collapsible chair embodying features of the invention;

Fig. 2 is a rear view of the chair, in perspective;

Fig. 3 is a bottom view of the chair, in perspective, and showing it in partially collapsed condition;

Fig. 4 shows, in perspective, and in separated relation, the parts of one of the locking brace members and parts by which pivoted connection of leg members to the ring are effected, fragments of leg members and of the ring being included;

Fig. 5 shows, in perspective, and in separated relation, fragments of one leg member and of the ring, and the means for effecting pivotal connection of the leg member to the ring;

Fig. 6 is a perspective view of a modified form of locking brace member; and

Fig. 7 is an edge elevation of the locking brace member of Fig. 6.

Referring to the drawings, the invention is illustrated as it may be embodied in a chair of the type which has a relatively large diameter rigid ring **10** of metal, or other suitably rigid and strong material, which is adapted to be supported in an inclined plane by leg members indicated generally at **12** and **14**. The ring **10** supports flexible sheet material **16** which is suspended within the ring in the general form of a relatively shallow circular bag in which a person may sit with the suspended sheet material constituting the bottom, back and sides of the chair.

The sheet material **16** may be secured to the ring **10** in any suitable manner and although it is represented as extending integrally all around the ring **10**, openings in the sheet material may be provided, if desired. Preferably, the sheet material will be readily detachable from ring **10** as by having the edge of the material wrapped and secured around a flexible ring **18** of wire (Fig. 2) having somewhat smaller diameter than the diameter of rigid ring **10**. The wrapped flexible ring **18** may be distorted enough to work it over the larger diameter ring after which it strongly resists being pulled off the rigid ring when the suspended sheet material **16** is tensioned in use of the chair.

The invention is primarily concerned with the leg members **12**, **14** and the means whereby they are connected to rigid ring **10** in a manner to be readily folded, and to be locked in rigid supporting relation to ring **10** when the chair is set up for use. Each leg member comprises a rigid generally V-shaped rod which has the ends of its two V-arms pivotally connected to the rigid ring **10**. The V-arms 12^a, 12^b of leg member **12** are disposed with the V-arm 12^a extending forwardly to its connection at **20** to ring **10** and with the V-arm 12^b extending upwardly to its connection at **22** to ring **10**. A rigid rod is formed to provide a substantially smaller generally V-shaped leg element **24** which has the ends of its V-arms 24^a, 24^b rigidly connected at **26**, by soldering, brazing, or the like, to the forwardly extending V-arm 12^a. Similarly, the V-arms 14^a, 14^b of leg member **14** are disposed with the V-arm 14^a extending forwardly to its connection **21** and with the V-arm 14^b extending upwardly to its connection at **23** to ring **10**. A smaller V-shaped leg element **28** has the ends of its V-arms 28^a, 28^b rigidly connected at **30** to the forwardly extending V-arm 14^a. When the chair is set up for use, the bends of the four V-shaped leg elements rest on the floor, or other support, with the ring **10** relatively rigidly maintained in a predetermined inclined plane, as represented in Figs. 1 and 2.

The pivotal connections at **22** and **23** of the forwardly extending V-arms 12^a and 14^a to ring **10** may be effected by an element **32** or **34** which are rigidly secured to ring **10**, as by soldering, brazing, or the like. An end of leg V-arm 12^b is pivotally connected to element **32** which

latter has an abutment part 32' in position to be engaged by V-arm 12^b when the chair is set up for use. Similarly, the leg V-arm 14^b is pivotally connected to element 34 which latter has an abutment part 34' in position to be engaged by V-arm 14^b when the chair is set up for use.

The leg V-arms 12^a, 14^a have their ends pivotally connected to ears 36^a and 38^a respectively on the elements 36 and 38 which are rigidly secured, by soldering, brazing, or the like, to the ring 10, each of the members 36, 38 having an abutment part 36' or 38' in positions to serve as stops against which the V-arms 12^a, 14^a respectively engage when the chair is set up for use.

As best seen in Fig. 2, a member 40 is fixed on V-arm 12^b at a location substantially spaced from the pivotal connection of the arm to element 32, this member 40 having a projecting ear 41 thereon. Element 34 has a generally similar projecting ear 35 thereon, and linkage including a pair of rods or bars 42, 44, pivoted together at 46, extends between the ears 35, 41. An end of bar 42 is pivoted to ear 35 at 43, and an end of bar 44 is pivoted to ear 41 at 45, this bar 44 having substantial extent from its pivot at 45 beyond the pivot 46 of the bars, so that a sliding retainer 48 on bar 42 may embrace the said extension of bar 44 when the bars are in alignment, thereby to retain them in alignment, as in Fig. 2, with the leg V-arm 12^b stopped against abutment part 32' of element 32.

A member 50, comparable to member 40, is fixed on leg V-arm 14^b and has a projecting ear 51 thereon to which an end of a linkage bar 52 is pivotally connected at 54. Bar 52 is pivotally connected at 56 to another linkage bar 58 which has an end pivotally connected at 60 to a projecting ear 33 on element 32. Bar 52 extends beyond pivot 56 for being embraced by sliding retainer 62 on bar 58 when these bars 52, 58 are in alignment. Hence, when the linkage bars are retained by the sliding retainers 48, 62, as in Fig. 2, the chair legs are rigidly and firmly maintained in operative positions with the leg V-arms 12^b, 14^b pressed against the abutment stops 32', 34' of elements 32, 34. Yet, by merely sliding retainers 48, 62 out of embracing relation to the extensions of bars 44 and 52, the linkage may be broken at the pivots 46, 56 to swing the chair legs inward for collapsing of the chair to a generally flat condition as illustrated in Fig. 3.

Preferably, the extension parts of bars 44, 52 which become embraced by the retainers 48, 62, are tapered toward a turned-up tip at 45 and 53, respectively, each said tip being adapted to engage and be stopped in a notch 42' or 58' when the bars of the respective linkages come into alignment. The tips 45, 53, when in the notches 42', 52', terminate flush with or slightly short of the plane of the face of the bar 42 or 58, whereby they do not interfere with sliding of the retainers to and from their bar-retaining positions.

If desired, a simple over-center type of linkage may be employed, as suggested in Figs. 6 and 7, where only one of the linkages is shown. Bars 64, 66 are pivoted together at 68, and an abutment 67 on bar 66 stops against the edge of bar 64 with the pivot 68 depressed somewhat beyond the center-line of the pivoted bars. An end of bar 64 is pivotally connected at 65 to the ear 41 of member 40 on V-arm 12^b and an end of bar 66 is pivotally connected at 67 to the ear 35 of element 34 on ring 10.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

I claim as my invention:

1. A collapsible chair frame comprising a relatively large circular ring element of rigid material and a pair of leg members each pivotally connected to said ring element at two relatively widely separated locations on said element, and said pair of leg members being adapted to support said ring element at a predetermined substantial inclination to the general plane of a support on which said legs may be resting, linkage means for each said leg member comprising two pivotally connected linkage elements, the outer end of one of said linkage elements of each said linkage means being pivotally connected to said ring element and the outer end of the other linkage element of each said linkage means being pivotally connected to a different one of said leg members at a location substantially spaced from the pivotal connection of the leg member to said ring element, and abutment means on said ring element at each of said pivotal connections of the leg members thereto, each said abutment means being arranged and adapted to constitute a stop against which one of said leg members engages when the said linkage elements of said linkage means for said one of the leg members are moved into approximate alignment with said linkage elements extending on opposite sides of their said pivotal connection together.

2. A collapsible chair frame comprising a relatively large circular ring element of rigid material and a pair of leg members each pivotally connected to said ring element at two relatively widely separated locations on said element, and said pair of leg members being adapted to support said ring element at a predetermined substantial inclination to the general plane of a support on which said legs may be resting, said ring element having a rigid projection thereon at each of said pivotal connection of the leg members thereto and the said pivotal connections being to said projections, each said projection having an abutment portion constituting a stop against which one of said leg members engages when moved about its said pivotal connections into a plane generally perpendicular to the plane of said ring element, separate linkage means for each said leg member, each said linkage means being pivotally connected to said ring element and to a different one of said leg members, whereby each leg member is swingable in response to actuation of its linkage means from said perpendicular plane generally into the plane of said ring element, and means for releasably retaining each said linkage means in a condition in which it presses said leg members against said abutment portions of said projections on the ring element.

3. A folding chair comprising a relatively large circular ring element of rigid material, flexible sheet material suspended from said ring element with substantial portions loosely disposed within the ring element for constituting a chair seat, a pair of leg members pivotally connected to said ring element and swingable between positions in which they are in spaced parallel planes which are perpendicular to the plane of said ring element and positions in which they are substantially in the plane of said ring element, and linkage means for releasably maintaining said leg members in their said spaced parallel planes perpendicular to the plane of said ring element.

4. A folding chair comprising a relatively large circular ring element of rigid material, flexible sheet material suspended from said ring element with substantial portions loosely disposed within the ring element for constituting a chair seat, a pair of leg members pivotally connected to said ring element and swingable between positions in which they are in spaced parallel planes which are perpendicular to the plane of said ring element and positions in which they are substantially in the plane of said ring element, abutment means on said ring element in position to be engaged by said leg members when the leg members are in their said spaced parallel planes, and an over-center linkage means for each said leg member operative to releasably retain its leg member stopped against a said abutment means.

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