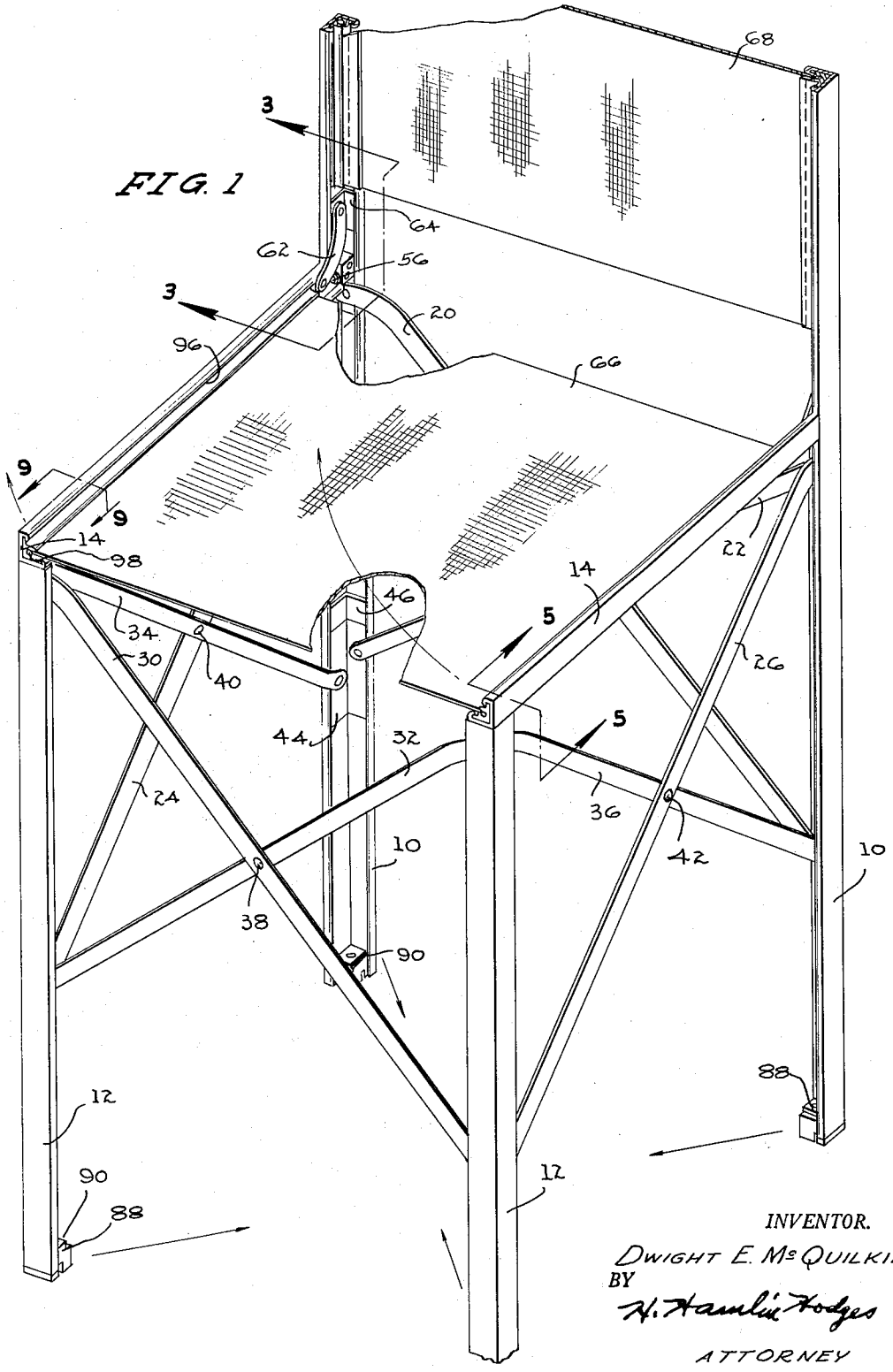
July 19, 1955 D. E. McQUILKIN 2,713,385

FOUR WAY FOLDING CHAIR

Filed April 11, 1951 2 Sheets-Sheet 1

FIG. 1



INVENTOR.
DWIGHT E. McQUILKIN
BY
H. Hamlin Hodges
ATTORNEY

July 19, 1955 D. E. McQUILKIN 2,713,385

FOUR WAY FOLDING CHAIR

Filed April 11, 1951 2 Sheets-Sheet 2

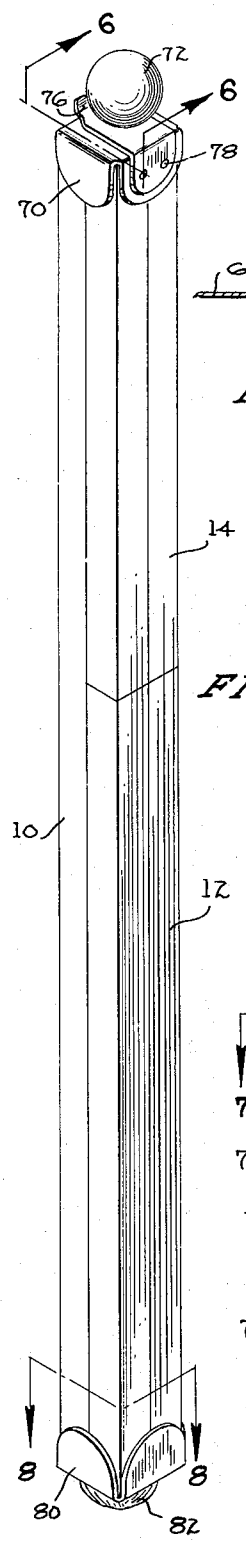


FIG. 2

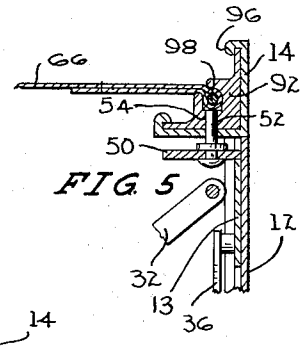


FIG. 5

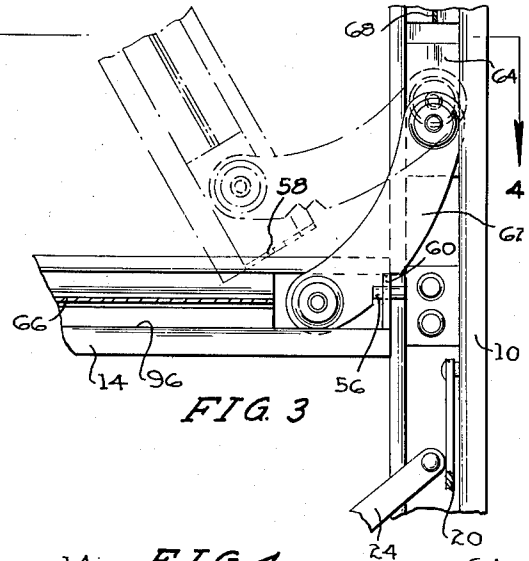


FIG. 3

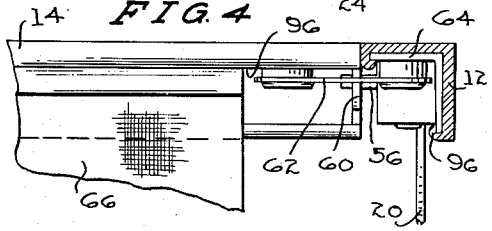


FIG. 4

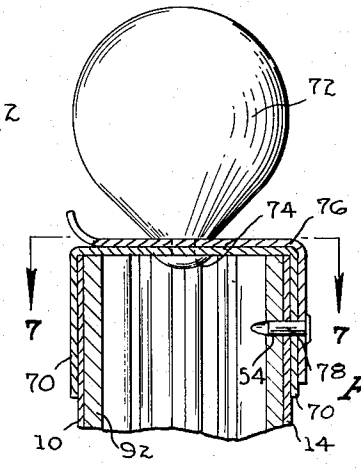


FIG. 6

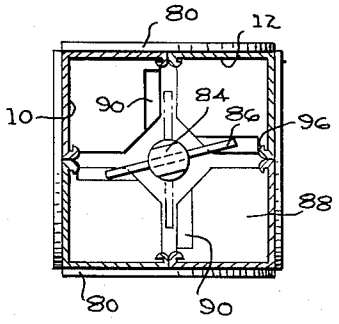


FIG. 8

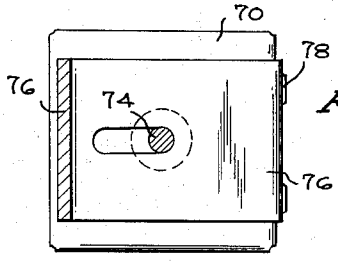


FIG. 7

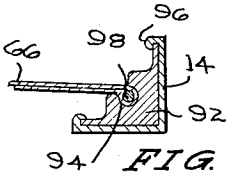


FIG. 9

INVENTOR.
DWIGHT E. McQUILKIN
BY H. Hamlin Hodges
ATTORNEY

United States Patent Office 2,713,385 Patented July 19, 1955

2,713,385

FOUR WAY FOLDING CHAIR

Dwight E. McQuilkin, Roanoke, Va.

Application April 11, 1951, Serial No. 220,468

7 Claims. (Cl. 155—140)

Many folding chairs have been made in the past and have served very well to provide a seat which may be collapsed and stored in a relatively small space. Generally speaking, folding chairs fold into a generally flat condition, the seat portion hinging into a plane parallel to the plane of the back, and lying close thereto. Normally, the width of the seat and back remain constant, and only the depth of the chair is reduced by folding the seat and back together.

My folding chair permits not only the front and back portions, but also the side extremities to be collapsed. By the use of my folding chairs, a large number of the same may be packed into a very small space, one chair being folded to be stacked alongside, or on top, of another. Also my four way folding chair is light weight, and when folded into its collapsed condition may conveniently be used as a cane or walking stick. A user could readily carry one of my four way folding chairs, using the same as a walking stick until he might desire to be seated. At that time the folded chair would be expanded laterally in two directions, and the seat portion hinged or folded into a horizontal position, perpendicular to the back portion, to thus provide a chair having a seat and back.

An object of my invention is to provide a folding chair that may be collapsed into an elongated tube.

A further object is to provide elongated rails, of extruded or cast metal, which may be positioned together holding the ends of folded fabric, and which may be pulled apart, spreading the fabric to form a chair seat and back.

A still further object is to provide a chair which may be folded into a compact unit so that many of the chairs may be stacked upon one another, or may lie along side one another.

An even further object is to provide a chair which may be folded into a compact tube which may be utilized as a walking stick.

Another object is to provide a folding chair, the legs, back and seat side rails of which fold into one straight element.

In the drawings:

Fig. 1 is an isometric view (partly broken away) of the chair in its extended condition, ready for use;

Fig. 2 is a perspective view of the chair in its folded, or collapsed condition;

Fig. 3 is a vertical cross-section, looking in the direction of the arrows and partly broken away, on the irregular line 3—3 of Fig. 1, and showing in phantom the chair seat and hinge swung out of engagement;

Fig. 4 is a horizontal cross-section, looking in the direction of the arrows, on the line 4—4 of Fig. 3;

Fig. 5 is a vertical cross-section, looking in the direction of the arrows and partly broken away, on the line 5—5 of Fig. 1;

Fig. 6 is a vertical cross-section, looking in the direction of the arrows and partly broken away, on the line 6—6 of Fig. 2;

Fig. 7 is a horizontal cross-section, looking in the direction of the arrows, on the line 7—7 of Fig. 6;

Fig. 8 is a horizontal cross-section, looking in the direction of the arrows, on the line 8—8 of Fig. 2; and

Fig. 9 is a vertical cross-section, looking in the direction of the arrows, on the line 9—9 of Fig. 1.

In Fig. 1, I have shown my four way folding chair in its fully extended condition, ready to be used as a chair. Part of the back of the chair has been broken away, and parts of the seat portions are also broken away so that the joints for the leg braces may be more easily seen, as also the hinge which provides for a hinging of the seat side rails to the back leg portions. To avoid confusion, lines to indicate the pleated folds of the back and seat portions have not been included. It will be understood, however, that these portions of the four way folding chair will preferably be provided with creases so that those flexible members may readily fold into the limited space provided in the hollow cavity formed by the seat side rails and the back legs when the same are collapsed and nested together. When collapsed, the seat and back are folded and maintained in their collapsed condition as shown in Fig. 2. Fig. 2 is adapted to show the chair, including its four legs, its back and its seat completely folded and collapsed forming a tube, preferably rectangular, which may be conveniently used as a walking stick. The end portions of the legs are disclosed as being held in their collapsed and folded condition so that the same may be maintained in that condition with the flexible back and seat portions folded within the tube which is formed by the legs and seat side rails.

The back legs **10** extend the full height of the chair, from a suitable horizontal surface to the upper extreme parts of the chair back. The front legs **12** of the chair are identical in shape with the back legs **10** (as will be described more fully hereinafter) and are adapted to extend from the same suitable horizontal surface, or support, to the desired height of a chair seat.

The side rails **14** of the chair seat are likewise identical in shape with the back legs **10** and the front legs **12**, the same being of a length to provide a fixed depth for the chair. The length of the side rails plus the length of the front legs equals the length of the back legs. Thus, when the chair is to be collapsed and folded into the condition in which it is shown in Fig. 2, the front legs **12** and the chair side rails **14** will be equal in length to the back legs **10** and lie adjacent thereto. The hinge (which will be described more fully hereinafter) permits the side rails **14** to be swung upwardly and raised slightly so that they may be plunged downwardly to engage the upper ends of the front legs **12**. In this manner the combined length of a side rail and a front leg will be equal to the length of a back leg, against which the side rail and front leg may be rigidly maintained in a straight line.

Preferably the legs and seat side rails are formed of substantially L-shaped (in cross-section) tubes which may be cast or extruded, all of these elements being identical in shape and being cut to be of desired lengths as described above. Braces **20**, **22**, **24**, and **26** are pivotally secured to the inner sides of the back legs **10** in a position relatively close to the point at which the seat side rails **14** are adapted to be removably secured at the time that the seat is in position for use as a chair seat. The front legs **12** are provided with braces **30**, **32**, **34** and **36** similar to the braces **20**, **22**, **24**, and **26** and pivotally secured near the upper extremities of the front legs **12**, the pivot pins therefor extending from plates **13** secured to the inside of the legs **12**.

The braces **22** and **34**, at their ends remote from their point of pivotal connection with the legs **10** and **12** re-

spectively, are pivotally secured to a follower 44 adapted to freely slide up and down within the back leg 10 (see Fig. 1). The braces 20 and 36 are likewise pivotally secured to a follower (not shown) within the other back leg 10. In the same manner, braces 24 and 32 and the braces 26 and 30 are pivoted to similar followers (not shown) within the front legs 12. Within the legs 10 and 12 at suitable points, I secure stops 46 which are adapted to prohibit the excessive upward movement of the followers 44, thus preventing any excessive extension of the legs 10 and 12.

The upper ends of the front legs 12 are provided with a lateral support or shelf 50 to which an upstanding pin or stud 52 is secured. The diameter of the stud 52 is equal to (with commercial tolerance) an aperture 54 provided in the surface, near one end of each side rail 14. Thus, when the side rails are folded down to form side rails of a seat, a stud 52 may be inserted into an aperture 54 to maintain a side rail 14 in its adjusted position. On each rear leg 10, I suitably secure a stud 56 which extends from the inner side of the leg 10 toward a front leg 12. Near the end of a side rail 14 remote from the aperture 54, I provide a lateral support 60 which is provided with an aperture 58 therethrough and into which a stud 56 may be inserted. Near the end of the side rail 14 having the support 60, I pivotally secure a link 62 which likewise is pivotally secured to a follower 64 adapted to slide freely within the rear leg 10. With this construction, the side rail 14 may pivot relative to the link 62, which in turn is pivotally secured to a follower 64 held within the rear leg 10. Thus the side rail may be readily pulled outwardly from the rear leg to become disengaged from the stud 56, and then to be folded so that it may lie adjacent to the rear leg 10 and position its aperture 58 so that the stud 52, extending from the front leg 12, may be inserted therethrough.

In this manner the side rails 14 may be removed from the position in which they are held by the stud 56 to be supported by the back leg 10, and may be folded over so that the aperture 58 is in position to accept and hold the stud 52 upstanding from the end of a front leg 12, after the same has been moved into a position to be adjacent to the lower extremity of the back leg 10. It will be understood that the links 62 will be provided with suitable cut out portions so that sufficient clearance will be left to prohibit it from contacting the support 60 or the stud 56 when those elements are properly engaged to maintain the seat portion in its position for use as a seat (see Fig. 3).

When a four way folding chair is in its collapsed condition (see Fig. 2) the seat 66 and the back 68, which are preferably creased in the form of pleats, will fold upon themselves (in accordion fashion) to occupy the relatively small space provided between the two side rails 14 and the uper portion of the two back legs 10, to be completely enclosed within the external side walls thereof. When in this folded condition, a suitable cap 70 may be placed over the upper ends of the back legs 10 and the outer ends of the side rails 14.

The cap 70 is provided with a suitable handle 72 extending upwardly from the cap 70 and is riveted, or otherwise secured, thereto by the rivet 74. A sliding latch 76 is adapted to bear against the uppermost portion of the cap 70 and be suitably held thereon by the handle 72 and its rivet 74 which passes through an oblong opening in the latch 76. On one side of the latch 76, I provide two inwardly extending studs 78 which are adapted to pass through apertures provided in the side walls of the cap 70 and into the apertures 54 of the side rails 14. Being thus positioned and engaged, the cap 70 is held in position around the upper extremities of the back legs 10 and the outer extremities of the side rails 14.

The lower extremities of the back legs 10 and the front legs 12 may be held in their assembled position as shown in Fig. 2 by a cap 80 which is adapted to fit snugly around their external surfaces. The cap 80 is locked into its holding position, as shown in Fig. 2, by a slight turn of the knob 82. The knob 82 is provided with a post 84 extending from one side thereof. The post 84 carries a transverse pin 86. At the time that the cap 80 is positioned snugly around the lower extremities of the back legs 10 and the front legs 12, the post 84 will be inserted between the legs 10 and 12 and their frictionally maintained feet 88. The feet 88 are provided with cut away grooves 90 along an edge of their inner surfaces. After the post 84 has been inserted between the nested legs, it may be turned a fraction of a turn, causing the pin 86 to become engaged in two diametrically opposed grooves 90 to maintain the cap 80 in its position, holding the nested legs.

As shown more particularly in Figs. 5 and 9, the side rail 14 (identical with the upper portion of the back leg 10) is shown to include not only the outer extruded or cast shell 14, but also an extruded or cast filler 92. The extruded filler 92 is provided with a longitudinally slotted groove 94, substantially circular in cross-section.

Before the filler 92 has been inserted within the leg 10 (or the rail 14), in which it is maintained frictionally, and by the folded over edges 96, the edges of the seat portion 66 (or the back portion 68) are provided with hems which will be inserted within the groove 94 and be maintained there by the pin or rod 98. In this manner, the hems are held by being forced to bear against the internal periphery of the groove 94 and the rod 98 which is inserted into the hem. It will be understood that the combined diameter of the rod 98 and the double thickness of the hem, is greater than the width of the slot in the groove 94. When assembled as described above, the filler 92 may be inserted into the leg 10 and/or the rail 14 to hold the seat 66 and/or the back 68 in proper position.

I claim:

1. A chair including a pair of back legs, a pair of front legs, and a pair of seat side rails hingedly secured to the back legs and adapted to extend therefrom to the said front legs, the pair of back legs being spaced apart by pivoted and slidable cross-braces, the pair of front legs being spaced apart by pivoted and slidable cross-braces, and the said seat side rails being slidably and hingedly secured to the said back legs.

2. A folding chair including front and back legs spaced apart by cross-braces, the said cross-braces being fixedly pivoted to the legs at the upper ends thereof and slidably pivoted to the said legs at the lower ends thereof, hinged links pivoted to said back legs, and seat side rails hinged to the said links and extending from said back legs to the said front legs.

3. A folding chair including front and back legs spaced apart by cross-braces, the said cross-braces being fixedly pivoted to the legs at the upper ends thereof and slidably pivoted to the said legs at the lower ends thereof, and seat side rails pivoted to slidable hinges secured to the said back legs and extending therefrom to the said front legs, the said slidable hinges including links pivoted to the said rails at one end of each link and pivoted to followers slidably held by the said back legs at the other end of each link.

4. A folding chair including a pair of front and a pair of back legs spaced apart, cross-braces extending between the pairs of legs, seat side rails having pivoted links secured thereto and extending therefrom to followers slidable in the said back legs said links aligning the ends of the said side rails with studs extending inwardly from said back legs when the side rails are at right angles to the said back legs.

5. A folding chair having L-shaped in cross-section front and back legs and seat side rails, each of the said side rails being pivoted to a link pivoted to a slidable fol-

lower in each of said back legs, means supporting the said side rails at right angles to the said back legs, means supporting the said side rails at right angles to the said front legs, and means maintaining a flexible seat and a flexible back between the said side rails and back legs respectively.

6. A folding chair including front legs, back legs and seat side rails, a flexible seat secured between the said side rails, a flexible back secured between the said back legs, and slidable followers in the said back legs hinged to the said side rails.

7. A folding chair including front legs, back legs and seat side rails, a flexible seat secured between the said side rails, a flexible back secured between the said back

legs, and a slidable follower in each of said back legs hinged to each of said side rails, the said side rails and back legs adapted to be drawn together enclosing the said flexible seat and back between their respective edges.

References Cited in the file of this patent

UNITED STATES PATENTS

1,916,772	Pratt	July 4, 1933
1,942,112	McQuilkin	Jan. 2, 1934

FOREIGN PATENTS

102,042	Australia	Sept. 30, 1937
202,947	Great Britain	Dec. 20, 1923