Sept. 27, 1955 C. E. JOHNSON 2,718,917

COLLAPSIBLE CHAIR

Filed March 23, 1954 2 Sheets-Sheet 1

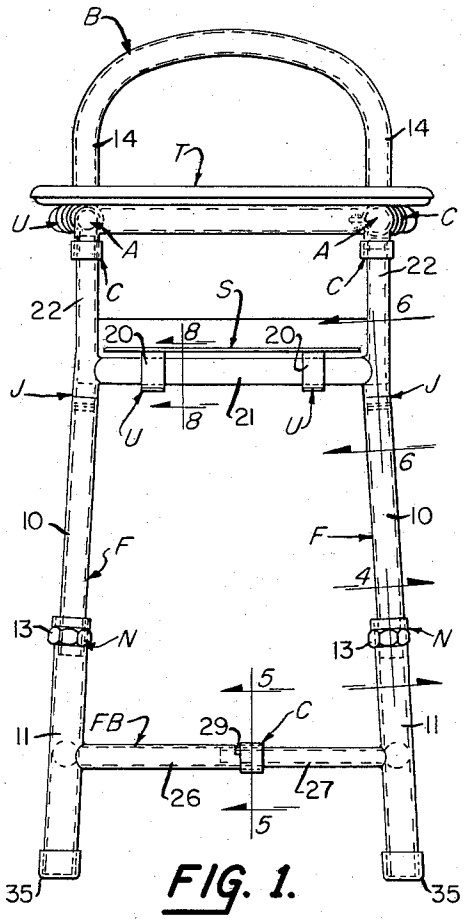


FIG. 1.

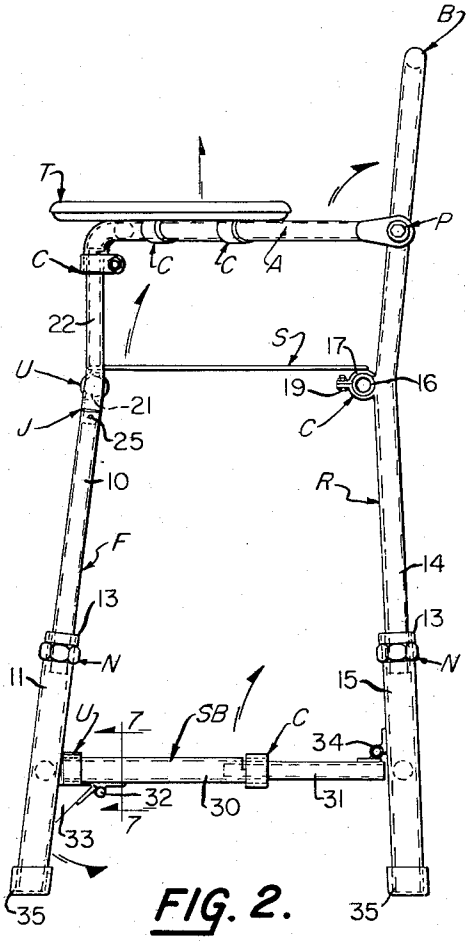


FIG. 2.

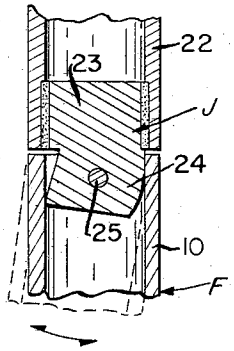


FIG. 6.

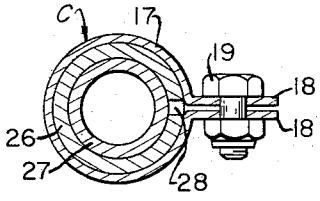


FIG. 5.

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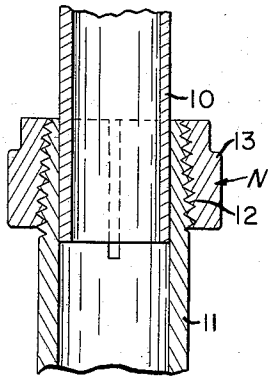


FIG. 4.

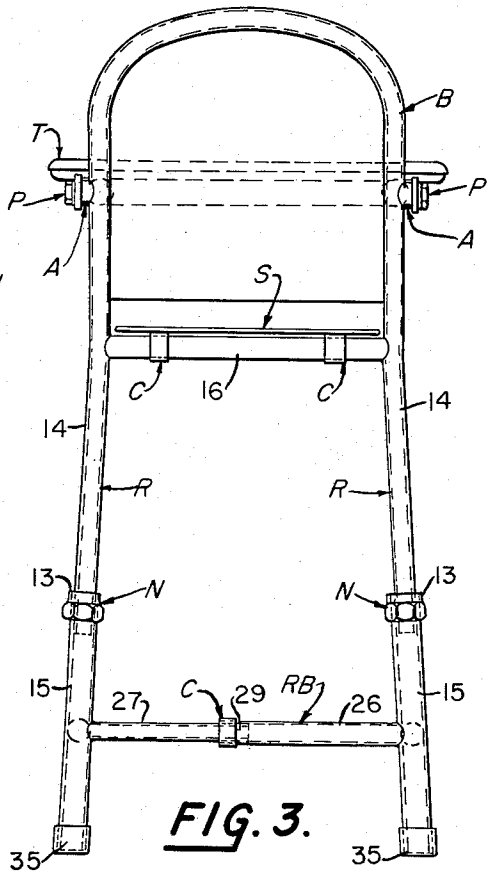


FIG. 3.

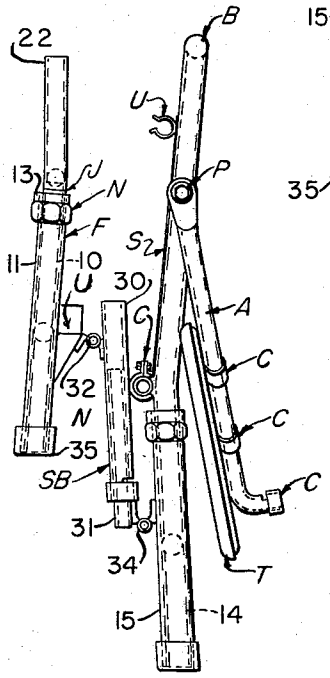


FIG. 9.

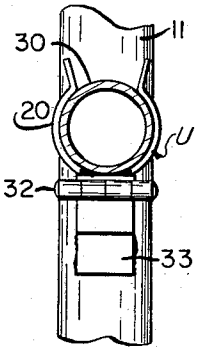


FIG. 7.

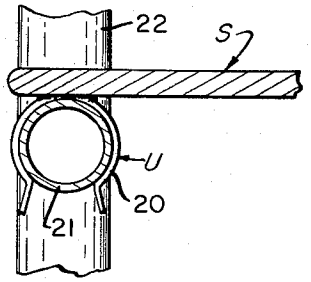


FIG. 8.

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COLLAPSIBLE CHAIR

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11 Claims. (Cl. 155—141)

This invention relates to chairs or like structures and more particularly to a chair construction which can be collapsed into a smaller unit size than when it is being used.

One of the objects of my invention is to produce a chair made from tubular elements which can be varied in height as desired and also can be collapsed into a much smaller space than when being used so as to permit easy shipping, transporting or storage.

Another object is to produce a chair which will have tubular legs with brace structure therebetween and will be so constructed that the legs can be adjusted as desired in length and in a simple manner, yet be fully braced in all adjusted positions.

Still another object is to produce a chair having tubular legs of adjustable height and braces for the legs, together with means permitting the legs to have a spreading relation so as to minimize "tipping over" of the chair, said braces being adjustable to permit height adjustment of the legs, yet continue to perform full bracing action and maintain the legs in their proper relationship.

A more specific object is to produce a chair of the type referred to that can be collapsed into a small and compact space for transportation and storage purposes.

Still another specific object is to produce an improved high chair for children which can be constructed from tubular elements and be adjustable as to height in an easy manner.

A further object is to produce a child's high chair from tubular elements that can be easily and quickly collapsed into a more compact unit having a size of small thickness or depth which will then permit easy shipping or storage.

A still further object is to produce a high chair from tubular elements that will be adjustable in height and also collapsible for transportation and storage, yet will be rigid when in use, firmly supported on the floor, and will be economical to manufacture so it can be sold at a low price to the user.

Other objects of my invention will become apparent from the following description taken in connection with the accompanying drawings showing, by way of example only, a child's high chair embodying my invention.

In the drawings:

Figure 1 is a front view of the high chair constructed from tubular elements;

Figure 2 is a side view of the high chair;

Figure 3 is a rear view of the high chair;

Figure 4 is a longitudinal sectional view taken on the line 4—4 of Figure 1 showing the squeeze nut joint construction between telescoping tubular parts of the legs so that the height of the chair can be quickly adjusted as desired;

Figure 5 is a sectional view taken on the line 5—5 of Figure 1 showing the clamping joint for the adjustable leg braces;

Figure 6 is a sectional view taken on the line 6—6 of Figure 1 showing the articulated joint construction of the front legs of the chair;

Figures 7 and 8 are sectional views taken on the lines 7—7 and 8—8 of Figures 1 and 2 showing additional details in connection with the structure of the chair; and

Figure 9 is a view showing the chair in collapsed position for easy transportation or storage in a small space.

Referring to the drawings in detail, the disclosed chair comprises two front legs F and two rear legs R. Each of these legs is made from tubular or pipe elements. The front legs are made in two sections comprising an upper section **10** and a lower section **11**, with the former telescopically received in the latter. Between each of the two sections are squeeze nut clamping units N of known construction, shown in detail in Figure 4. The upper end of the lower section **11** is tapered and split axially, with the tapered part having threads **12**. The lower end of the upper section **10** carries a nut **13** slidable thereon and being provided with tapered threads to fit onto the threads **12**. When the nut **13** is screwed onto the threads **12** it will force the split parts of the upper end of the leg section **11** into tight frictional engagement with the lower end of the leg section **10** and thus hold the two sections in fixed relation. When adjustment of the leg sections is desired, the nuts can be readily unscrewed, the sections shifted axially and then screwed up again.

The rear legs R also each have upper sections **14** which telescope into lower sections **15**. Each of these two sections also have the squeeze nut units N whereby they can be held in any desired adjustable relation. The upper tubular sections **14** of the rear legs extend upwardly and are integrally joined in the shape of a U to provide the back B of the chair, which can have a support panel as shown.

The chair has a seat S made of suitable material, preferably a sheet of metal. The rear end of this seat has a pair of strap clamps C attached thereto, as by soldering or welding. The clamp surrounds a cross brace tube **16** extending between the two upper tubular members **14** of the back legs which, as mentioned, also are extended and joined to provide the back B.

The type of strap clamp C between the cross brace **16** and the seat permits the seat to pivot on the brace. This strap clamp is used in other places on the chair and is shown in detail in the sectional view of Figure 5. It is of simple construction comprising a C-shaped strap **17** with parallel extending flanges **18** at its ends. Through holes in these flanges fits a bolt **19** to accomplish the desired clamping action of the strap.

The front end of the seat has two U-shaped clips U shown in detail in Figure 8. These clips are made from a strip of spring material **20** formed in a U and having its closed end soldered or welded or otherwise attached to the bottom of the seat with its open end down. These clips are arranged to detachably connect the front of the seat to a front cross brace tube **21** which extends between two sections **22** articulated to the top sections **10** of the two front legs F by suitable joints J, shown in Figure 6. These joints are constructed in a manner to allow for the front legs to have a spreading relation with the rear legs so the chair will be better braced against tipping forces. As shown, each tube section **22** has secured therein a plug **23** provided with an extension **24** projecting into the top tube section **10** of the front leg and pivoted therein by a pin **25**. The rear of the extension is curved, as shown in Figure 6, and the front is cut back near the fixed part of the plug, also as shown. This joint structure thus permits the front leg F to have its lower end swung outwardly to a position out of line with section **22**, all as indicated in dotted lines in Figure 6. The full spread position of a front leg is shown in Figure 2.

Connected between the tops of the sections **22** which

are articulated to the front legs are arms A for the chair. These arms are alike and made from tubular pieces. The rear ends of the arms are pivoted by suitable pivot bolts P to the upper ends of the rear legs at a suitable point above the seat, all as clearly shown in Figure 2. The forward ends of the arms are bent downwardly and suitably clamped to the top ends of the sections **22**. The clamps are indicated by the letter C and are of the strap type already described and shown in detail in Figure 5. The arms A are of a size to telescope over the top ends of the sections **22** and the clamping action between the two is obtained in a manner to be later described in connection with the use of the clamp C on the adjustable braces for the legs.

The legs of the chair have their lower ends braced by like front and rear braces FB and RB and like side braces SB, one only being shown in detail by the side view of Figure 2. The front and rear braces each have two telescoping tubular sections **26** and **27** which will be held in adjusted clamping relation by the strap clamps C, already described in detail and shown in Figure 5, these clamps being free and not welded to any member as they are on the rear of the seat S. In order that the clamps can efficiently accomplish a clamping action between the tubular sections, the end of the outer or larger section **26** is provided with a longitudinal slit **28** (see Figure 5) and at a distance rearwardly of the end of this section equal to the width of the clamp the tube has a cross cut **29** (see Figures 1 and 3) extending about 180 degrees around the tube from the slit. This construction thus establishes a resilient tongue under the clamp which can be forced into tight frictional engagement with tubular section **26** when the clamp is tightened up. The non-telescoping ends of the tubular sections are suitably attached to the lower sections of the front and back legs as shown in Figures 1 and 3.

The side braces SB, as shown in Figure 2, each have two telescoping sections **30** and **31** constructed to be clamped together in any adjusted position by a strap clamp C in the same manner as the front and rear braces. Each of the sections **30** of the side braces has its outer end at the bottom side connected by a hinge **32** to a bracket **33** fixed on the front leg. This bracket also carries a U-shaped clip U like the one shown in Figure 8. This clip is attached with its legs up to receive the outer end of the section **30** of the brace beyond the hinge joint to thus give additional support, yet permit the brace section **30** to swing to a position parallel with the leg section **11**. Each outer end of brace section **31** is hinged at its top by a hinge **34** to the rear leg section **15**, as shown, so that this brace section can swing upwardly into parallel relation to the rear leg.

In order to complete the chair as a high chair for a child, it can be provided with a tray T suitably constructed either from wood or metal. The tray at one end has attached to its under side the strap clamps C, shown in Figure 5, which can be employed to clamp such end to one of the arms A. The clamps will not be drawn up too tightly. This will then allow easy pivotal swinging or hinging of the tray to this arm and also any sliding adjustment. The other end of the tray has secured thereto downwardly extending open U-shaped clips U, already described in detail and shown in Figure 8. These clips will fit over the other arm A and detachably hold the tray to said arm.

The lower sections of the legs can carry suitably antifriction tips **35** made of rubber or other suitable material.

From the foregoing description it will be apparent that I have produced a chair which can be readily adjusted as to height and yet will be extremely rigid. A child can use the chair as a high chair or as a low chair, either with or without the tray. Also, the chair can be economically made from tubular material. If it should be desired to

change the height of the chair, this can be done by loosening the squeeze nuts N on the four legs and then shifting the lower sections of these legs on the upper section, after which the squeeze nuts will be retightened. A large range of adjustments is available. In fact the height may be decreased from its maximum almost fifty percent. During extreme height changing of the legs, the braces should also be adjusted and this is easily accomplished by first loosening and then tightening the clamps C thereon so the telescoping sections can be shifted to accommodate for the adjustment of the legs.

When it is desired to transport or store the chair, its overall size can be materially decreased by collapsing the chair. The chair in its collapsed condition is shown in Figure 9. To accomplish collapsing, the side braces and the front and back braces first have their sections unclamped so that the sections thereof can telescope freely. This will then permit the shortening of the legs to their fullest extent by a loosening of the squeeze nuts. The arms A are detached from the upper ends of the sections **22** by unloosening the clamp C associated therewith. If now the tray is swung upwardly on its C clamps, it will be out of the way so both arms can be swung over the back B, after which the tray can be reattached to the arm from which it was disconnected and all the parts can then be caused to lie along the back B, as shown in Figure 9.

The front of the seat S can now be disconnected from the brace **21** between the articulated sections **22** at the tops of the front legs and be swung to position alongside the front of the back B. To complete the collapsing the front legs now need only be swung upwardly to a position in front of the seat and the back legs, which will be permitted by the hinged ends of the side braces SB. It will now be noted the parts are as shown in Figure 9 where the length of the unit approximates that of the upper sections **14** of the rear leg plus the back B of the chair and the thickness is only a fraction of the distance between the back and front legs of the chair when it is set up for use. To make the front legs and side braces still shorter, the side brace sections can be fully telescoped. This assures small space for transportation and storage and also a smaller packaging cost when the manufacturer ships to retailers or there is shipment direct to the consumer.

In the claims, the phrase "seat portion" is meant to refer to member **5**, tube **21**, brace **16**, and sections **22**, and all of these parts together with a portion of the U of back B are utilized to form the disclosed seat structure. However, the said phrase is intended to be construed broadly as other types of parts could be assembled to form a suitable seat and various seat structures come within the scope of this invention.

I am aware that modifications in the structure disclosed can be made without departing from the fundamental principles of my invention, and therefore I desire it to be understood that the scope of my invention is not to be limited except in accordance with the structural terms of the appended claims and equivalents thereof.

What is claimed is:

1. A chair made from tubular material and comprising a seat portion, a back, and front and back legs each having lower tubular sections telescoping with upper tubular sections, means for securing the telescoping sections together in various positions, at least two of said legs being pivotally mounted to said seat portion to permit an outward spreading relation with the remaining legs, and braces between the lower tubular sections of the legs, said braces comprising tubular telescoping sections and means for securing the said sections of the braces together in different extended positions so as to provide for adjustment and compensate for variation in distance between the lower sections of the legs when the two legs are spread and as they are adjusted relative to the upper sections to vary the height of the seat.

2. The chair of claim 1 in which the spreading of at least two of the legs is accomplished by an articulated joint means located immediately below said seat in said upper tubular section.

3. The chair of claim 1 in which the upper sections of the rear legs are extended to form the back and there are provided tubular elements from the back extensions connected to the upper sections of the front legs which form part of the seat portion and provide arms for the chair.

4. The chair of claim 3 in which the arms are pivoted to the upper sections of the rear legs and detachable from the front legs so as to be swingable to a position alongside of the upper sections of the rear legs and the side braces between the legs are pivotally connected to said legs so as to permit the front legs and their brace to be swung to a position closely to and in substantially parallel relation to the rear legs so as to make a compact unit for transportation or storage.

5. The chair of claim 1 in which there is a tubular cross member connecting the upper sections of the front legs and the seat is detachably connected to the cross member and pivoted to the upper section of the rear legs and the side braces between the front and rear legs are pivotally attached thereto so that when the seat is detached from the front legs the front legs can be swung to a position juxtaposed to the rear legs.

6. A chair comprising a seat portion, and front and back legs, said seat portion including a joint connection, at least two of said legs being pivotally mounted to said seat portion at said joint connection to permit an outward spreading relation with the remaining legs and braces between said legs, said braces comprising telescoping sections and means for securing the said sections of the braces together in different extended positions so as to provide for adjustment when the two legs are spread.

7. The chair of claim 6 in which the joint connection includes two tubular sections articulated to the front legs to provide spreading joint means.

8. A collapsible chair made from tubular material having tubular front legs and tubular rear legs, a back on the rear legs, front, rear and side braces for the legs, a seat pivoted to a cross member attached to the rear legs and disconnectably connected to a cross member between the front legs to permit swinging to a position in a plane close to that of the rear legs and the back, and means for pivotally connecting the ends of the side braces to the front and rear legs so that upon disconnection of the seat from the front legs said front legs can swing about the side braces as a pivotal means to a position close to the rear legs, arms connected to the back and front legs, said arms being connected to the front legs by tubular sections which are articulated to the front legs, and means associated with the side braces to permit their extension to cause the front legs to have a spreading relationship with respect to the rear legs.

9. A collapsible chair made from tubular material having tubular front legs and tubular rear legs, a back on the rear legs, front, rear and side braces for the legs, a seat pivoted to a cross member attached to the rear legs and disconnectably connected to a cross member between the front legs to permit swinging to a position in a plane close to that of the rear legs and the back, and means for pivotally connecting the ends of the side braces to the front and rear legs so that upon disconnection of the seat from the front legs said front legs can swing about the side braces as a pivotal means to a position close to the rear legs, the side braces having telescoping tubular sections and means for clamping the sections in different extended conditions so as to give a spreading relationship to the legs, and means permitting the legs to move relatively to each other when the side braces are extended.

10. A collapsible chair made from tubular material having tubular front legs and tubular rear legs, side braces for the legs, a seat portion, a back, and arms connected from the back to the front legs, said arms being connected to the front legs by tubular sections which are articulated to the front legs, and means associated with the side braces to permit their extension to cause the front legs to have a spreading relationship with respect to the rear legs.

11. A collapsible chair as defined in claim 10 wherein the side braces consist of telescoping tubular sections and means are provided for clamping the sections in different extended positions.

References Cited in the file of this patent

UNITED STATES PATENTS

1,033,324	Judge et al.	July 23, 1912
1,136,300	Vaughn	Apr. 20, 1915
1,505,518	Workman, Jr.	Aug. 19, 1924
1,970,266	Allerding	Aug. 14, 1934
2,019,090	Pepper	Oct. 29, 1935
2,050,667	Moreland	Aug. 11, 1936
2,468,683	Michal	Apr. 23, 1949