

Oct. 20, 1953

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2,655,982

ORTHOPEDIC CHAIR

Filed July 5, 1949

2 Sheets-Sheet 1

FIG. 1.

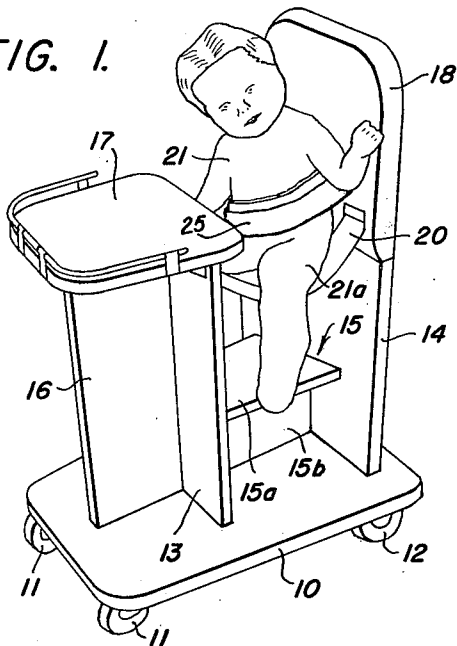


FIG. 2.

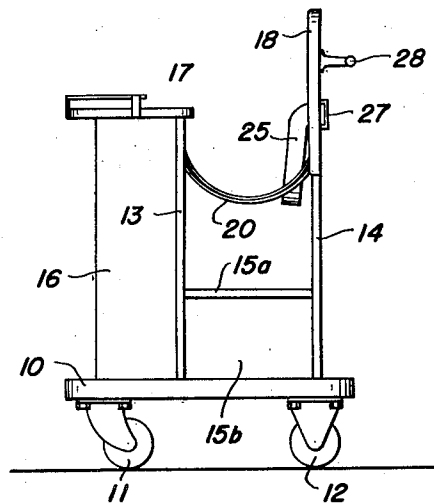


FIG. 3.

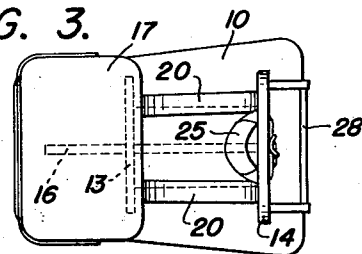


FIG. 4.

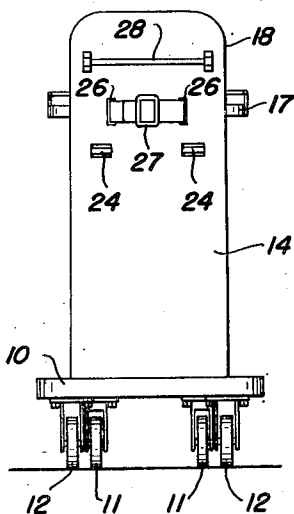


FIG. 5.

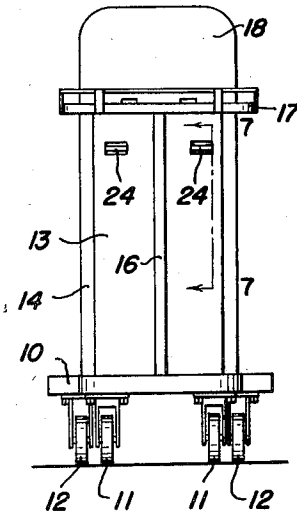
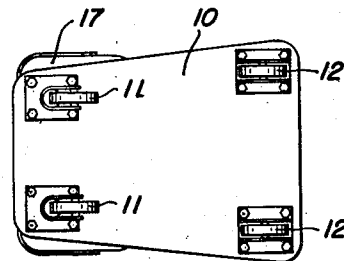


FIG. 6.



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FIG. 7.

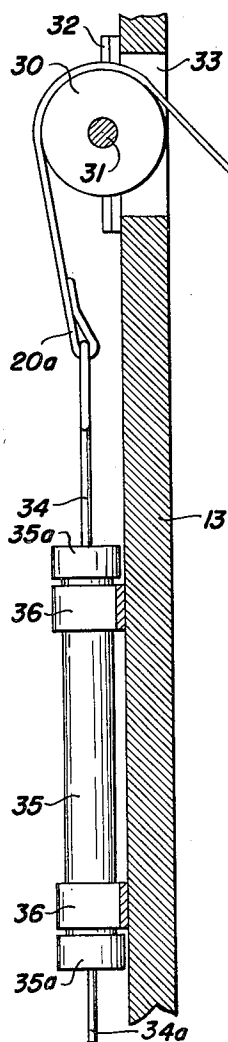
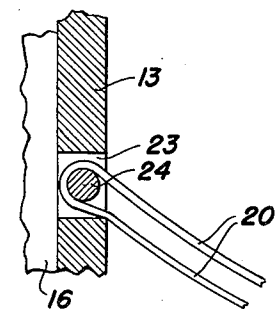


FIG. 9.

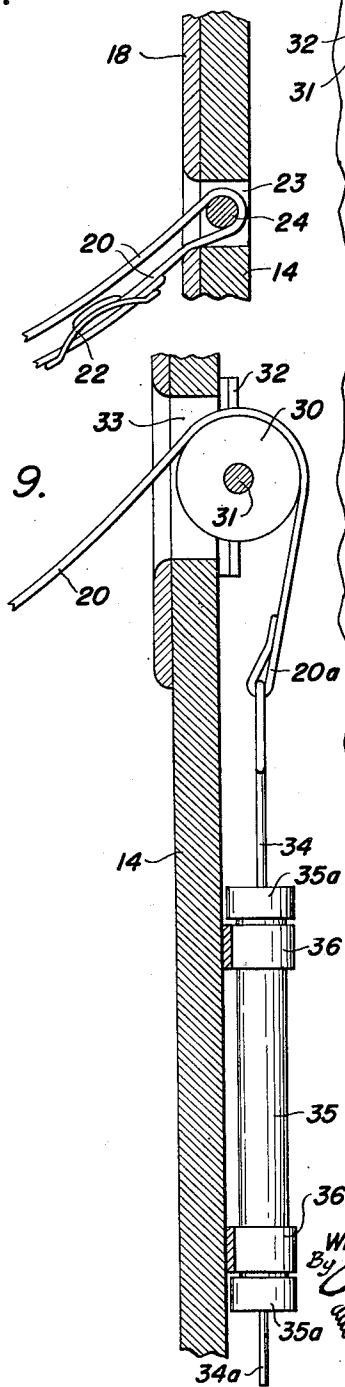
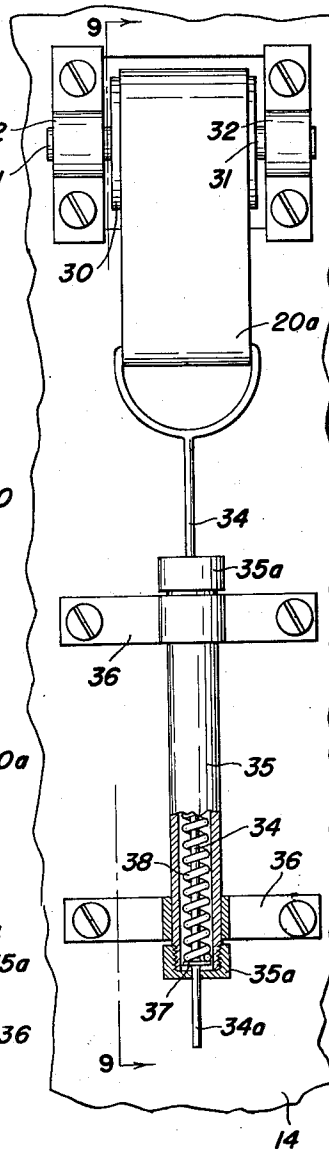


FIG. 8.



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UNITED STATES PATENT OFFICE

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ORTHOPEDIC CHAIR

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19 Claims. (Cl. 155—30)

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This invention relates to equipment for supporting orthopedic patients whose lower limbs are encased in casts.

I have found that there is a high incidence among infants of what is known medically as congenital dislocation of the hip, which, for treatment, requires the application of a plaster cast to the legs, thighs, and trunk almost up to the arm pits. This cast must be maintained in position for approximately six to eight months in order to insure permanency of the setting operation performed on the hip joints of the child at an early age.

If a child is to lead anything like a normal life during the period of treatment, some supporting equipment is required. Such equipment is preferably mobile, so as to enable easy handling of the youngster in the everyday tasks about the home and elsewhere.

Accordingly, a principal object of the invention is to provide a chair adapted to comfortably, safely, and effectively support an orthopedic patient whose lower limbs and trunk are encased in a cast.

An object is to provide for adjustment of the seating portion of the chair to accommodate different positions of the occupant.

An object is to provide for ready mobility of the chair, whether occupied or unoccupied.

An object is to provide an orthopedic chair of general utility for young children undergoing treatment for dislocation of the hip.

I accomplish the above objects by forming a sling seat from flexible straps, so that the seat structure simulates a human lap.

The straps have sufficient width and are so spaced as to provide individual hammock-like supports for each thigh. Front and rear standards provide anchorage for the straps. The anchorage may be and advantageously is resilient in character.

For providing a mobile chair of general utility for a child undergoing treatment for congenital dislocation of the hip, or for a similar condition, I erect a chair superstructure upon a relatively heavy slab base equipped with wheels. The wheels advantageously comprise a pair of caster or swivel wheels at the front and a pair of similar though fixed wheels at the rear. In this way, convenient mobility is achieved with complete safety. The heavy platform base provides the necessary ballast for stability.

The chair superstructure advantageously comprises front and back standards of panel formation, having respective widths sufficient to am-

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ply comprehend and mount the spaced sling straps. In this way adequate support is provided for the child's back, while the front is well guarded by structure having requisite breadth for grasping by the child in achieving a complete stability during all phases of use of the chair.

In the presently preferred embodiment of the invention, the front and back panels of the chair superstructure are strongly held in position and reinforced by an intermediate and interconnecting structural portion of T-formation, providing a raised floor immediately below the sling seat. Such floor may be utilized for the placement of a receptacle to facilitate toilet care from time to time, or may serve to receive toys or other articles.

A reinforcing fin of panel formation projects forwardly from the front panel, centrally of its width, and serves, together with the front panel, to support a tray useful in the feeding of the child and for play purposes.

The complete unit constructed in this manner is compact, strong, stable, and easily moved from place to place about the home and in the streets outside. It affords comfortable and effective support for the occupant.

Further objects and features of the invention will become apparent from the following detailed description of a presently preferred embodiment, as illustrated in the accompanying drawings.

In the drawings:

Fig. 1 represents a perspective view of the orthopedic chair as constructed for and occupied by a child;

Fig. 2, a side elevation of the chair unoccupied;

Fig. 3, a top plan;

Fig. 4, a rear elevation;

Fig. 5, a front elevation;

Fig. 6, a bottom plan;

Fig. 7, a fragmentary vertical section taken on the line 7—7 of Fig. 5, and drawn to a somewhat enlarged scale, intermediate structure being broken away for convenience of illustration;

Fig. 8, a fragmentary rear elevation drawn to an enlarged scale and showing a preferred type of spring anchorage for the sling straps; and

Fig. 9, a vertical section corresponding to Fig. 7, but taken on the line 9—9 of Fig. 8.

Referring to the drawings—the inventive embodiment illustrated is an orthopedic chair designed particularly for a child undergoing treatment for a condition such as congenital dislocation of the hip, wherein the legs and thighs and

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often the trunk are rigidly encased in a plaster cast.

As shown, the chair comprises a heavy slab or platform base 10, advantageously made of wood planking. Such base 10 is provided with wheels to afford easy mobility for the chair. The front wheels 11 are of caster or swivel type, while those in the rear, designated 12, are fixed, thereby enabling easy steering by a person pushing the chair from place to place. The construction of the base 10 and of wheels 11 and 12 is heavy to provide a ballast effect.

A chair superstructure is erected upon and rigidly attached to the base 10. Such superstructure includes front and back standards 13 and 14, respectively, rigidly interconnected by reinforcing floor structure 15 of T-formation. The standards 13 and 14 are preferably of panel formation, being conveniently made of suitable lumber which is rigidly attached to the base 10 by means of fastening elements, such as screws or nails, and, desirably also, by gluing.

The floor structure 15 is also conveniently made of suitable lumber to provide a single joist 15b and floor proper 15a, these elements being likewise rigidly secured to the base 10 and standards 13 and 14.

In order to further reinforce the chair superstructure, a fin 16 rises from rigid attachment to the base 10 and projects forwardly from rigid attachment to the front standard 13, preferably centrally thereof. Such fin 16 is likewise conveniently made of suitable lumber, and is advantageously substantially coextensive in height with the front standard 13, so as to aid the latter in supporting a tray 17.

The back standard 14 is of greater height than the front standard 13, and its upper portion is upholstered, as at 18, providing a comfortable back for the chair.

The seat of the chair is of flexible sling formation, provided by a pair of straps 20 which are arranged side-by-side in mutually spaced relationship transversely of the chair. Such straps 20 have anchorage in the standards 13 and 14, and extend therebetween. They are preferably woven web fabric of considerable width so as to provide comfortable, hammock-like support for the cast-encased thighs 21a of an occupant 21, Fig. 1.

The straps 20 are preferably adjustable in length, being for this purpose doubled and secured at their ends by respective buckles 22, Fig. 7, of conventional, positive-hold type. As shown, the loop ends of the doubled straps pass through respective slots 23, appropriately formed in the standards 13 and 14, and are anchored over hanger rollers 24. In use, the doubled straps usually hang slack, as illustrated, to an extent determined by the particular position found most suitable for any given occupant of the chair.

In order to safely secure a child within the chair, a safety strap 25 is provided. It is preferably of the same woven web fabric as the seat straps 20, and its ends advantageously pass through respective slots 26 appropriately formed through the back 13 of the chair. Such ends are adjustably connected by a buckle 27.

The occupant of the chair, such as the child 21, Fig. 1, sits astride the pair of straps 20 of the sling seat, with his legs projecting sidewardly, somewhat as illustrated. His cast-encased lower limbs are adequately and comfortably supported, though they hang freely. The tray 17 is positioned immediately in front of the seat, and, thus, is available for the serving of meals and for

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play. The raised floor beneath the seat is available for any use found suitable, for example, the placement of a toilet receptacle or the resting of articles within reach of the occupant in instances where the cast does not interfere with the necessary reaching movement.

The front panel 13 is preferably made narrower than the back panel 14, and the straps 20 preferably converge from wide spacing at the back to narrower spacing at the front, all to provide for greater comfort and firm seating of the occupant.

A handle 28 at the back of the rear standard 14 provides for convenient pushing of the chair from place to place on the wheels 11 and 12.

Though the above construction has been found to be a particularly advantageous one in practice, the various structural members may be changed considerably where the chair is made from different materials, for example, metal, without sacrificing the essential inventive features. Such changes may be made by those skilled in the art by adhering to sound engineering principles and to the generic teachings hereof.

It is often desirable to provide resilient anchorage for the sling straps 20 in the front and back standards of the chair, so there will be a cushioning action additional to the flexibility inherent in the straps. An advantageous form of resilient anchorage is illustrated in Figs. 8 and 9. There, a spool type sheave or pulley 30, fixed on a shaft 31, is mounted for rotation in bearings 32 secured to the forward face of the front standard 13 or to the rear face of the back standard 14, as the case may be. The sheave 30 works within a slot 33 formed within the standard immediately below and preferably as an enlargement of the slot through which the strap passes.

Retained by the corresponding loop end 20a of the particular flexible sling strap 20 concerned is an elongate anchor rod 34, which extends through an elongate housing 35 and has its free end 34a projecting therefrom as a guide. The housing 35 is preferably made up of an elongate tube closed at opposite ends by screw caps 35a, and is fastened to the particular standard concerned as by means of mounting clips 36.

The anchor rod 34 has a shoulder 37 formed thereon adjacent its projecting guide end 34a, such shoulder being positioned within the housing 35 and serving as an abutment for the lower end of a coil spring 38. The upper end of spring 38 abuts against the upper cap 35a of the housing, so that the spring is compressed under weight resting upon the sling seat strap 20, affording cushioning resiliency for such strap.

It is preferred that such resilient anchor assemblies be provided at both front and back of the chair for both seat straps.

While this invention is here illustrated and described with respect to a presently preferred specific form thereof, it should be understood that various changes may be made therein and various other forms may be constructed on the basis of the teachings hereof, by those skilled in the art, without departing from the protective scope of the following claims.

I claim:

1. An orthopedic chair, comprising a base provided with wheels; a chair superstructure erected on the base, said superstructure including mutually spaced front and back standards of panel formation, and reinforcing structure for said standards; and a flexible sling seat anchored in and extending between said standards, said sling

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seat comprising a pair of mutually spaced sling straps extending between said standards.

2. The combination recited in claim 1, wherein the sling straps hang slack between the standards.

3. The combination recited in claim 2, wherein the sling straps have resilient anchorage in the standards.

4. The combination recited in claim 1, wherein the sling straps are adjustable in length.

5. The combination recited in claim 1, wherein the reinforcing structure comprises floor structure of T-formation rising from said base and rigidly interconnecting the standards.

6. The combination recited in claim 1, wherein the reinforcing structure includes a fin rising from said base and extending forwardly from the front standard, the said fin and front standard being substantially coextensive in height; and wherein a tray is mounted upon the fin and the front standard immediately in front of the chair seat.

7. The combination recited in claim 1, wherein the reinforcing structure comprises floor structure of T-formation rising from said base and rigidly interconnecting the standards, and a fin rising from said base and extending forwardly from the front standard, the said fin and front standard being substantially coextensive in height; and wherein a tray is mounted upon the fin and the front standard immediately in front of the chair seat.

8. The combination recited in claim 1, wherein the base is of relatively heavy slab formation and has a pair of swivel wheels in front and a pair of fixed wheels at the rear to afford mobility for the patient.

9. The combination recited in claim 1, wherein a flexible, safety, waist strap passes through the back standard and has a length adjustment positioned at the rear of said back standard.

10. The combination recited in claim 1, wherein the front panel is narrower than the back panel, and the sling straps converge from wide spacing at the back panel to narrower spacing at the front panel.

11. An orthopedic chair, comprising front supporting structure, back supporting structure, and rigid structure rigidly interconnecting said front and back structures, said back structure including a chair back; and a chair seat of sling formation, said seat being made up of a pair of flexible straps arranged side-by-side in mutually spaced relationship, said straps having their front ends anchored in said front portion of the chair, their rear ends anchored in the said back portion of the chair, and their intermediate portions hanging freely between.

12. The combination recited in claim 11, wherein the spacing of said sling straps is narrower at the front of the chair than at the back.

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13. The combination recited in claim 11, wherein the sling straps are adjustable in length.

14. The combination recited in claim 11, wherein the sling straps hang slack between their respective points of anchorage.

15. In an orthopedic chair, mutually spaced front and back standards; rigid structure rigidly interconnecting said front and back standards, and a chair seat of sling formation extending between and anchored in said standards, said chair seat comprising a pair of flexible straps extending from front to rear and arranged side-by-side in mutually spaced relationship.

16. The combination recited in claim 15, wherein said flexible straps are resiliently anchored to said standards.

17. The combination recited in claim 16, wherein opposite ends of each strap are anchored by respective anchorage assemblies, each of which comprises a sheave over which the strap passes; an elongate anchor rod attached to the strap end; an elongate housing through which the anchor rod slidably extends; shoulder means on the rod adjacent the end thereof which is remote from said strap attachment; and a spring operably positioned within said housing and about said anchor rod, between said shoulder means and that housing end which is adjacent said strap attachment.

18. The combination recited in claim 17, wherein the sheave is mounted for rotation within the wall thickness of its corresponding standard.

19. The combination recited in claim 1, wherein there are horizontally extending hangers secured to the respective standards intermediate their heights, and wherein the sling straps of the flexible sling seat make respective closed loops about corresponding sets of hangers and hang freely therebetween.

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