

Oct. 3, 1967

E. D. LEVY ETAL

3,345,105

FOLDABLE CHAIR

Filed March 3, 1966

4 Sheets-Sheet 1

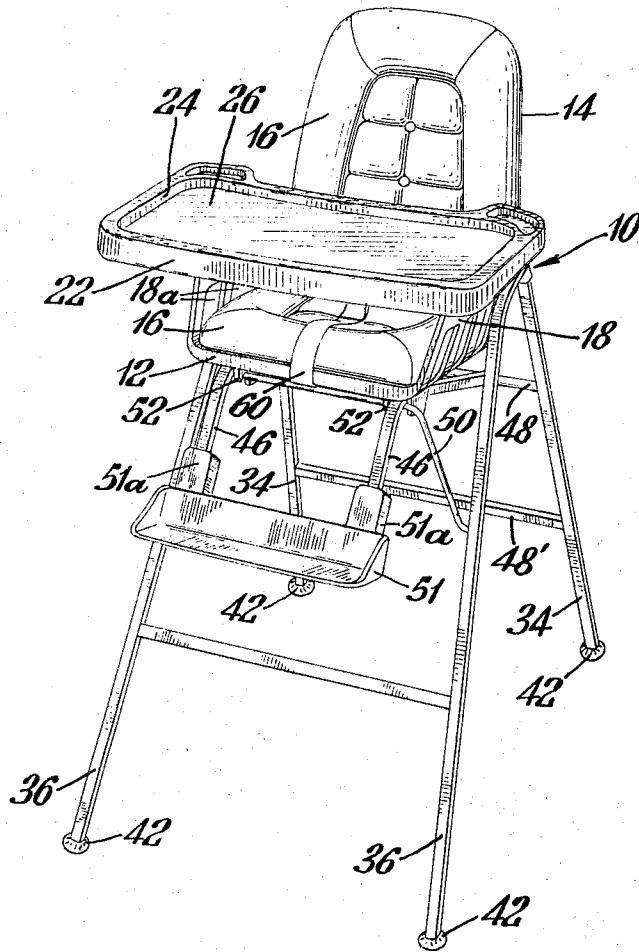


Fig. 1.

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4 Sheets-Sheet 2

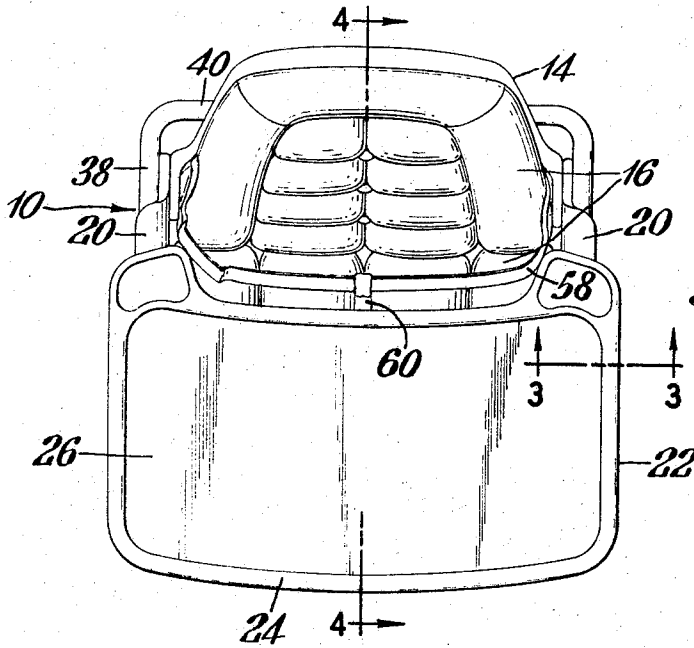


Fig. 2.

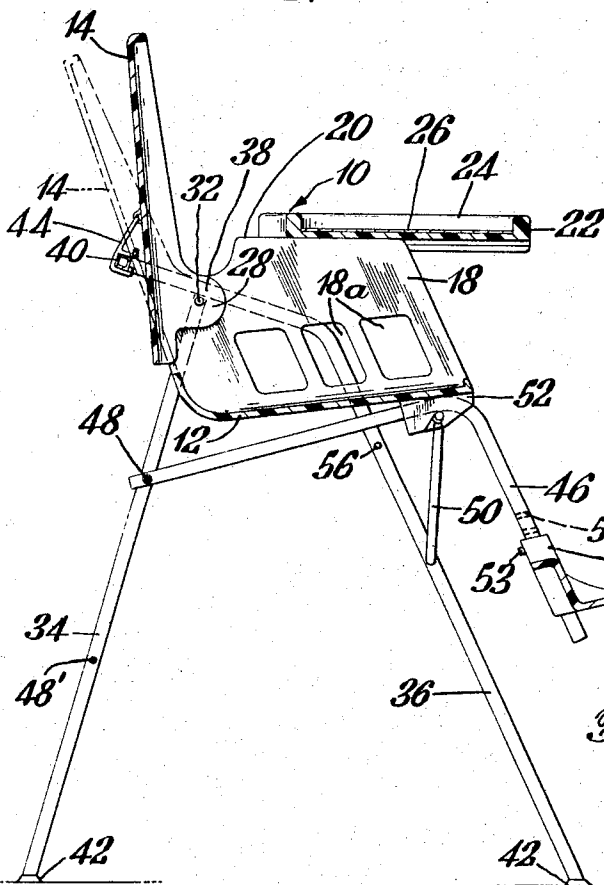


Fig. 4.

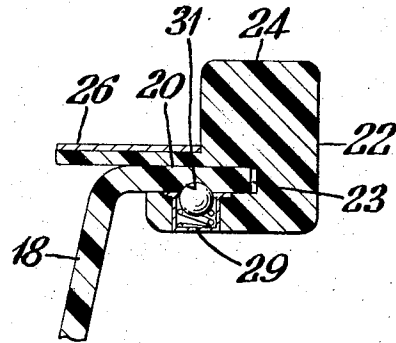


Fig. 3.

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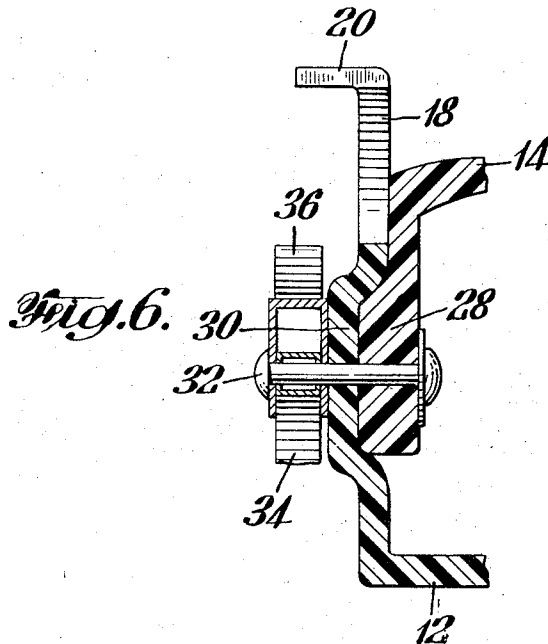
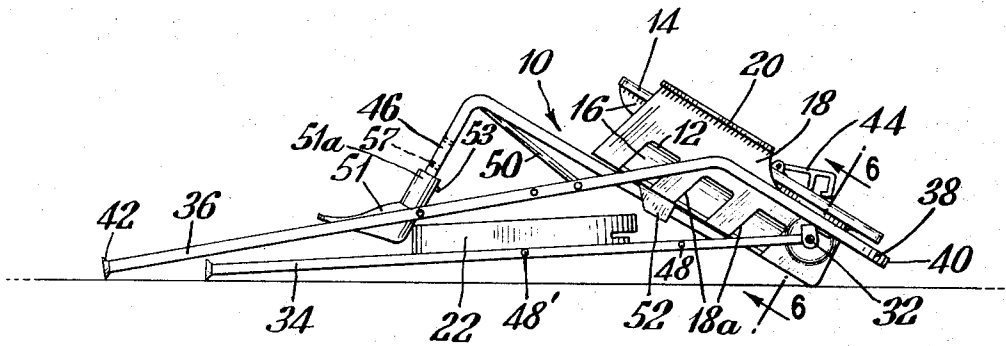
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Fig. 5.



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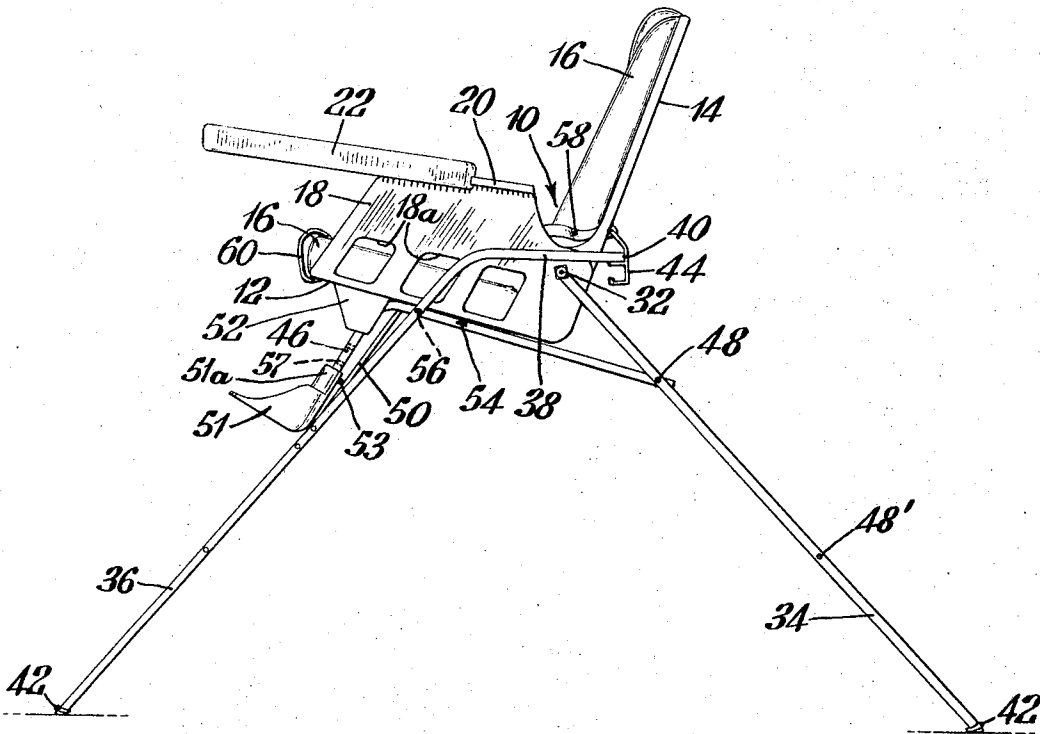


Fig. 7.

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FOLDABLE CHAIR

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11 Claims. (Cl. 297-24)

ABSTRACT OF THE DISCLOSURE

A foldable high chair comprising a rigid one-piece plastic seat member and a rigid one-piece plastic back member hingeably fastened to the seat member and adapted to fold against the seat member in a closed position, both the rigid seat and back members have resilient cushion means mounted therein manufactured from vinyl polymer foam. The chair is further provided with a tray and a rigid plastic footrest each of which is adjustable and removable. The chair can also assume a normal, erect, upright position or a reclining position. The chair can be lowered to the floor to facilitate feeding infants. The chair is also easily foldable in a compact unit for carrying or storage.

This invention relates to a foldable chair and more particularly to a foldable, cushioned high chair.

Many folding chairs are known which may be folded into a relatively flat package. However, they are fabricated from a multitude of parts and consequently require a number of time consuming and costly assembly operations. For example, the seat and back portions generally are metal provided with suitable cushioning means. The seat and back portions are then connected to each other by additional metal parts which are riveted in place. However, the riveted connections weaken the metal parts and often cause failure during normal use of the chair. The employment of many metal parts in the chair results in an undesirably high overall weight and makes normal handling cumbersome.

Furthermore, present day foldable high chairs generally have one erected straight back position and are therefore confined to use by children of prescribed ages. For example, an infant of three months of age cannot be seated in a typical high chair because he is unable to sit upright at that age in a straight back chair.

Accordingly, it is an object of this invention to provide a foldable, cushioned high chair which is light weight and fabricated from a minimum of parts requiring a minimum of assembly operations.

It is a further object of this invention to provide a foldable high chair having a plurality of erected positions.

SUMMARY OF THE INVENTION

In accordance with the present invention, it has been found that the above objects are accomplished by providing a foldable high chair with a one-piece seat member hingeably fastened to a one-piece back member wherein the seat and back members have resilient cushions means mounted therein and the hingeably fastened seat and back members are swivelly mounted to a metal frame in such a manner that the chair, as a unit, can assume a normal, erect, upright position or a reclining position.

Broadly, the foldable high chair of this invention comprises a rigid one-piece plastic seat member having resilient cushion means mounted therein and a rigid one-piece plastic back member hingeably fastened on the seat member and having resilient cushion means mounted therein adapted to fold against the seat member in a

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closed position for storage or carrying. Also, the seat member has a pivot support means proximate the back member and an upwardly extending rear edge adapted to engage the lower edge of the back member when the high chair is in an open position. The seat member is further provided with upstanding sides having outwardly extending top edges.

The back member has pivot means proximate the seat member adapted to pivot in the pivot support means of the seat member. Means are provided to secure the pivot in the pivot support means. Extending downwardly from said means and pivotally mounted thereon are a pair of rear legs. A pair of front legs integrally formed as a continuous unit having rearwardly turned upper portions continue to a lateral portion extending laterally behind said back member. Means are provided on the rear of said back member to secure said front legs to said chair.

The chair is further provided with bracing means pivotally mounted to the rear legs and underriding the seat member to a point proximate the lower front edge thereof. Means are also provided for securing the bracing means to the front legs.

In the drawing:

FIGURE 1 is an isometric view of a preferred foldable high chair embodying the invention;

FIGURE 2 is a top view of the chair of FIGURE 1;

FIGURE 3 is a sectional view in detail taken along lines 3-3 of FIGURE 2 illustrating the tray attachment to the seat member;

FIGURE 4 is a sectional view in elevation of the chair of FIGURE 1 taken along lines 4-4 of FIGURE 2 with the chair in a reclining position shown in phantom;

FIGURE 5 is a side view of FIGURE 1 illustrating the chair in a folded position;

FIGURE 6 is a sectional view in detail of the hinge taken along lines 6-6 of FIGURE 5;

FIGURE 7 is a side elevational view of FIG. 1 illustrating the chair in a lowered position.

Referring now to the drawing there is shown in FIGURE 1 a preferred high chair 10 having a rigid one-piece plastic seat member 12 and a rigid one-piece plastic back member 14 each of which have resilient cushion means 16, mounted therein by suitable adhesive or mechanical means. However, the resilient cushion means mounted in the seat member 12 can be made removable for ease of cleaning. As further shown in FIG. 1, the seat member has upstanding sides 18 having outwardly extending top edges 20 (FIG. 3). The sides 18 can have cut outs 18a as shown which serve to reduce the overall weight of the chair as well as improve its appearance.

As shown in FIGS. 2 and 3, slidably mounted on the edges 20 is a concave rigid plastic removable tray 22 having upstanding rigid plastic side edges 24 and a preferred stainless steel insert 26. The side edges 24 of the tray have longitudinal grooves 23 adapted to cooperate with the edges 20 of the chair 10 in a tongue and groove manner in order to secure the tray to the chair. Locking means comprising a spring-loaded ball 29 are positioned in the lower portion of grooves 23 which is forced into detent 31 in the underside of edges 20 whereby the tray 22 can be locked in place at various adjustable positions by means of a plurality of such detents 31.

To permit relative folding and unfolding movement between the seat member 12 and the back member 14, the back member 14 is provided with pivot means 28 and the seat member 12 has pivot support means 30 (FIG. 6). The pivot means 28 is adapted to pivot in the pivot support means 30 of the seat member 12 and can be secured therein by a headed pin 32 and the like.

As perhaps best seen in FIG. 4, the back member 14 has a pair of rear legs 34 secured thereto by the pin 32 and extending downwardly therefrom. A pair of front

legs 36 integrally formed as a continuous unit have rearwardly turned upper portions 38 and a lateral integral portion 40 extending behind the back member 14. The lateral portion 40 is secured to the back member 14 by means of a dual hook 44 (FIG. 4) adapted to cooperate with the lateral portion 40. The ends of the front and rear legs (36, 34) can be fitted with suitable non-skid members 42 fabricated from rubber, plastic, or the like. As further shown in FIG. 4, the dual hook 44 is swivelly mounted on the back member 14 and is adapted to cooperate with the lateral arm 40 of the front legs 36 in order to maintain the chair 10 first in a fixed normal erected position and secondly in a fixed reclining position (shown in phantom) and also in FIG. 7. While the hook 44 as shown is preferred, any means which function in the same manner are suitable.

The chair 10 is also provided with a plurality of bracing members. For instance, as shown in FIG. 1, a pair of bracing rods 46 are each pivotally mounted at one end to the uppermost rod 48 of two lateral rods 48, 48' respectively extending between rear legs 34, and are each pivotally mounted to the underside of the seat member 12 by means of a second bracing rod 50 extending laterally on the underside of the front edge of the seat member 12 and pivotally secured thereto by a slotted flange 52 integrally formed with the seat member. The rod 50 extends downwardly and diagonally to the front legs 36 where it is pivotally secured thereto. As further shown in FIG. 1, the bracing rods 46 extend downwardly from the seat member 12 and have a rigid plastic footrest 51 which has adjustable heights and is adapted to be detached from rods 46. The adjustable heights are maintained by means of suitable pins 53 extending through the upwardly extending portions 51a of footrest 51 and into one of a vertical series of holes 57 at the rear of bracing means 46.

As further shown in FIG. 7, the rods 46 are further provided with a plurality of slots 54 and the front legs have a male member 56 secured thereto adapted to cooperate with the slots 54 so that the chair at rest can assume a plurality of adjustable heights from the floor. In a preferred alternate embodiment, the location of the male member 56 and the slots 54 can be varied such that cooperation can be had therebetween when the chair is in its normal upright position (FIG. 1). Thus, the rods 48 and 50 and the flange 52 can be eliminated resulting in a chair of simplified construction.

When the chair is in the unfolded or erected position of FIG. 1 it can be collapsed to a more compact arrangement of the parts as shown in FIG. 5 for carrying or storage. This is accomplished by simply grasping and releasing the rod 50 from the slotted flange 52, releasing the hook 44 from the lateral arm 40 and pulling the back member 14 towards the seat member 12. This will allow the back member 14 to be folded over the seat member 12 and the rear legs 34 to be collapsed against the front legs 36.

To move the parts from the folded position of FIG. 5 to the original erected position of FIG. 1, the rod 50 is grasped and snapped into the slotted flange 52 thereby causing the front legs 36 to draw apart from the rear legs 34. The back member 14 is lifted upwardly away from the seat member 12 and the hook 44 is snapped over the lateral arm 40.

The hook 44 prevents accidental unfolding while also securing the chair in erected upright or reclining positions. Thus, even if the rod 50 is released from the slotted flange 52, the chair cannot fold or collapse with the baby in it until the hook 44 is released. When the chair is in the unfolded position and the hook engaged with the lateral arm, the chair can be moved or lifted with no possibility of folding action.

As a further safety precaution, as shown in FIGS. 1 and 2, the back member 14 is provided with a waist strap 58 and the seat member 12 has a crotch strap 60

attached thereto and positioned centrally of the front edge thereof adapted to be detachably attached to the waist strap 58.

The one-piece plastic back seat, tray, and footrest members of the chair of the invention provide an article of much lighter weight than the conventional all metal chair without any sacrifice of strength. It is preferred to employ a stainless steel insert in the tray in order to facilitate cleaning and provide for improved sterility. The tray however can be entirely of plastic material if one so desires. Furthermore, because the present chair requires a minimum of parts for its fabrication, its assembly operation is simplified thereby resulting in substantial cost savings.

Another advantage of the chair of the present invention is that it is a multi-purpose chair. For example, if one so desired, the footrest and tray can be detached from the chair thereby converting it to a youth chair. The chair can serve as a recliner for infants who are too young to sit up. Also, the chair can be lowered to the floor to facilitate feeding infants.

For purposes of the invention it is preferred to mold (for example by injection, compression, vacuum molding techniques and the like) the rigid back, seat, tray and footrest members in the form of a rigid thermoplastic material which gives an advantageous low ratio of strength to weight, for example, rigid foamed high-density polyethylene. However, other typical choices are thermoplastic compositions such as polypropylene, polystyrene and mixtures and foams thereof, copolymers of ethylene and propylene, mixtures and foams of such polyolefins, and polyvinyl halides. While vinyl polymer foam is desirable as the resilient cushion means for the proposed chair any comparable cushioning can be employed.

What is claimed is:

1. Foldable chair comprising:

- (A) rigid one-piece plastic seat member having resilient cushion means mounted therein;
- (B) rigid one-piece plastic back member hingeably fastened to said seat member having resilient cushion means mounted therein and adapted to fold against said seat member in a closed position;
- (C) said seat member having
 - (1) pivot support means proximate said back member;
 - (2) an upwardly extending rear edge adapted to engage the lower edge of said back member when said chair is in an open position;
 - (3) side portions extending substantially upwardly from the bottom edge of said seat member having outwardly extending top edges;
- (D) said back member having pivot means proximate said seat member adapted to pivot in the pivot support means of said seat member;
- (E) means to secure said pivot in said pivot support means;
- (F) pair of rear legs extending downwardly from said pivot support means and pivotally mounted thereon;
- (G) pair of front legs integrally formed as a continuous unit having rearwardly turned upper portions continuing to a lateral portion extending behind said back member and secured thereto;
- (H) bracing means pivotally mounted to said rear legs and underriding said seat member, and
- (I) means for securing said bracing means to said front legs.

2. The foldable chair of claim 1 wherein said rigid plastic members comprise high density polyethylene.

3. The foldable chair of claim 1 wherein said resilient cushioning means comprises vinyl foam.

4. The foldable chair of claim 1 wherein said outwardly extending top edges are provided with a tray slidably mounted thereon and adapted to be removed therefrom.

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5. The foldable chair of claim 1 wherein said bracing means extend downwardly from the front edge of said seat member having an adjustable footrest secured thereto to be removed therefrom.

6. The foldable chair of claim 1 wherein the rear portion of said back member is provided with releasable means swivelly mounted thereon adapted to engage the lateral portion of said front legs extending behind said back member in a first upstanding position and in a second reclining position.

7. The foldable chair of claim 1 wherein said front legs are provided with engaging means and said bracing means are provided with receiving means adapted to cooperate with said engaging means whereby said chair can rest at a plurality of adjustable heights from the floor.

8. The foldable chair of claim 1 wherein said back member has waist strap means attached thereto.

9. The foldable chair of claim 4 wherein said tray comprises high density polyethylene.

10. The foldable chair of claim 5 wherein said footrest comprises high density polyethylene.

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11. The foldable chair of claim 8 wherein said seat member has crotch strap means attached thereto and positioned centrally of the front edge thereof adapted to be detachably attached to said waist strap means.

References Cited

UNITED STATES PATENTS		
2,580,178	12/1951	Kvarnstrom ----- 297—40
2,652,098	9/1953	Nordmark ----- 297—50
2,777,503	1/1957	Grace ----- 297—149
2,816,598	12/1957	Shone ----- 297—40
2,851,086	9/1958	Weiner ----- 297—149
2,852,068	9/1958	Rossi ----- 297—149
2,973,804	3/1961	Gill ----- 297—149
3,086,812	4/1963	Eads ----- 297—30
3,113,802	12/1963	Goldsholl et al. ----- 297—35
3,245,717	4/1966	Levy ----- 297—254

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