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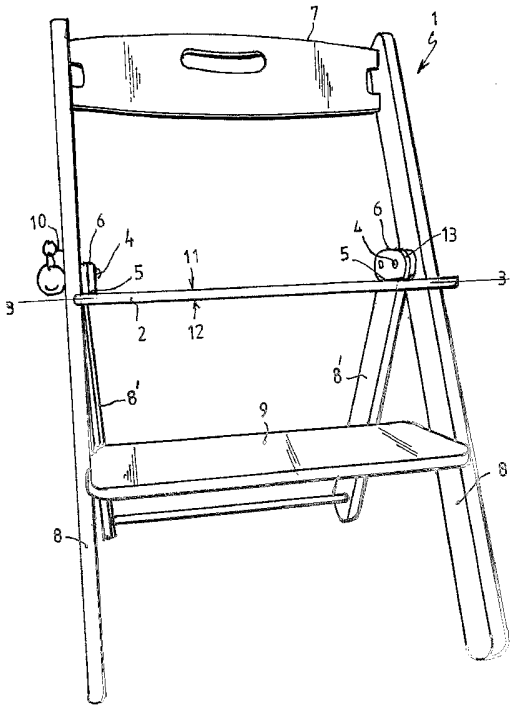
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(54) Title: SEATING FURNITURE



(57) Abstract: The invention relates to a piece of seating furniture provided with a frame and a seat part (3) having a front edge, a rear edge, a first seating surface (11) and an opposite second seating surface (12), which seat part (3) is attached to the frame so as to be flippable from a first position, in which the first seating surface (11) is in a position of use, to a second position, in which the second seating surface (12) is in a position of use, and vice versa.

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Seating furniture

The invention relates to a piece of seating furniture.

Such pieces of seating furniture, for instance chairs, folding chairs, armchairs and the like, are very commonly known.

A problem with seating furniture is that it takes up too much room, this particularly regards seating furniture such as high chairs and chairs for adults.

Chairs are known of which the seat part can be taken out and attached at a higher or lower position which for instance changes a chair into a high chair and vice versa. A drawback of such known chairs is that often the seat part has to be detached and placed again. This is laborious.

FR-A-2.269.892 shows a chair having a seat that is rotatable about an axis outside of the seat as a result of which the seating level can be changed, and a back rest that is rotatable as a result of which the level changes. When the seat is rotated the angle of the seat also changes. Due to the adjustment of the seat and back rest the sitting posture changes. The seat is rotatable by means of a hinge which is provided with a locking pin for blocking rotation of the hinge and thus securing the seat.

US-A-5.238.291 shows a high chair with an upper part having a piece of flexible, supple material on which a baby can sit, and tabletop. The upper part is rotatable about an axis. In a fixed first position the upper part

functions as high chair. By detaching a blocking the upper part can be flipped, wherein it remains swingable to serve as a swing. Such a high chair cannot serve as seating furniture for a bigger child or an adult.

It is an object of the invention to overcome said drawback, or to offer an alternative piece of seating furniture.

It is furthermore an object of the invention to offer an alternative piece of seating furniture that can be used in various ways.

To that end the invention regards a piece of seating furniture provided with a frame and a seat part having a front edge, a rear edge, a first seating surface and an opposite second seating surface, which seat part is attached to the frame so as to be flippable from a first position, in which the first seating surface is in a position of use, to a second position, in which the second seating surface is in a position of use, and vice versa.

By rotating or flipping the seat part the possibility is offered to change the location of the seat part such that two applications are possible. Moreover the structure is simple, as a result of which a cheap piece of seating furniture having several functions can be achieved. Particularly seating furniture can be provided which may serve as a chair for an adult or an older child, and as a high chair for babies/toddlers.

In an embodiment of the seating furniture according to the invention the seat part is flippable about an axis of rotation outside of the seat part. Thus it is possible to move the location of the seat that is in a position of use.

In an embodiment thereof the axis of rotation is situated outside of the plane of the seat part. Thus the seating level in the first position differs from the one in the second position.

In an embodiment the projection of the axis of rotation is situated between the front edge and the rear edge. As a result it is possible to choose a different seating depth when flipping.

In an embodiment the projection of the axis of rotation is situated out-of-centre between the front edge and the rear edge. As a result the seating depth in both positions is different.

When the movement of the axis of rotation out-of centre is chosen correctly a third application may even become possible. When the distance between the front edge and the axis of rotation is at least approximately twice as large as the distance between the rear edge and the axis of rotation, a piece of seating furniture is created wherein the depth of the seat part, particularly the projection to the fore thereof, can be varied from a distance enabling use as a chair, to a distance enabling use as a high chair but for instance also as steps. Thus the seating furniture acquires several applications.

Preferably the seating furniture is a folding chair which with the seat part in the first position is a chair and with the seat part in the second position is a high chair. When the high chair is provided with an additional footrest and the distance of the axis of rotation to the rear edge is chosen optimally, depending on the depth of the footrest, use as steps may even become possible.

In an embodiment the seating furniture according to the invention is provided with hinges on both sides of the seat part, each comprising a first fastening member connected to the frame and a seat fastening member connected to the seat part. As a result a stable rotation is made possible. In an embodiment thereof the seat fastening member keeps the seat part spaced apart from the axis of rotation. As a result two levels to set the seat part become possible.

In an embodiment of the seating furniture according to the invention the frame is provided with retaining means for keeping the seat part in the first and the second position. This guarantees the stability.

In an embodiment of the seating furniture according to the invention the retaining means comprise a lower stop, positioned for in the first position abutting the first seating surface. Thus the seat part has a stable first position.

In a further embodiment the retaining means comprise an upper stop, positioned for in the second position abutting the second seating surface. Thus the seat part has a stable second position.

In an embodiment of the seating furniture according to the invention, the seat part is flippable about an axis of rotation outside of the plane of the seat part and the retaining means comprise a lower stop, positioned for in the first position abutting the first seating surface, and an upper stop, positioned for in the second position abutting the second seating surface, wherein the lower stop and the upper stop are positioned above each other and both on the same side of the plane of the seat part as the axis of rotation. Thus movement from the first to the second position and vice versa can be accomplished without problems.

In an embodiment the first fastening member has a width extending substantially perpendicular to the axis of rotation and on both sides thereof, and a depth extending substantially in line with the axis of rotation, wherein the first fastening member forms an upper stop on the one side of the axis of rotation and a lower stop on the opposite side. As a result the stops can easily be realised. Moreover, as will become clear from the figures, the fastening member can be chosen such that it may be a part of the overall structure, such even that the piece of seating furniture can be designed as a folding chair.

In an embodiment the retaining means further comprise locking means for locking the seat part in the second position. As a result the seat part can also be safely used in the second position, even as a step.

In an embodiment the axis of rotation is situated outside of the seat part and out-of-centre between the front edge and the rear edge, wherein preferably the distance between the front edge and the axis of rotation is at least approximately twice as large as the distance between the rear edge and the axis of rotation.

As a result the seat part can change both level and depth in one go.

In an embodiment of the seating furniture according to the invention the distance between the front edge and the axis of rotation is at least approximately twice as large as the distance between the rear edge and the axis of rotation. As a result the seat part can be used as a seat and for instance as a step or a children's seat.

In an embodiment of the seating furniture according to the invention it comprises hinges on both sides of the seat part, each comprising a first fastening member connected to the frame and a seat fastening member connected to the seat part, wherein the seat fastening member is shielded by the first fastening member. Thus it is prevented that fingers, for instance children's fingers, may get wedged in the hinge.

In an embodiment thereof the first fastening member comprises two lips in between which the seat fastening member is movably accommodated. As a result the rotation is well defined, and fingers cannot get wedged in the hinge.

In an embodiment the first fastening member comprises an edge and the

hinges each define a hinge axis of rotation, wherein the hinge axis of rotation is spaced apart from the edge, wherein the distance from the edge to the axis of rotation is such that the seat part tightly moves along the edge when flipping the seat part. Thus the fingers can hardly get wedged in the hinge, and flipping is easy.

In an embodiment of the seating furniture as a folding chair which with the seat part in the first position is a chair and with the seat part in the second position is a high chair, the frame is furthermore provided with a back rest and a table that can be hooked into the back rest for offering a table to the seat part in the second position. As a result a chair can easily be converted into a high chair.

Preferably the table on both sides is provided with S-shaped hooks that can be hooked into holes in the back rest and which, when hooked into the back rest, form stops on both sides of the back rest. As a result the table is of a simple, robust design and is easy to place.

The invention will be further elucidated on the basis of an exemplary embodiment of a piece of seating furniture according to the invention, in particular a folding chair, in which:

Figure 1 shows a folding chair having a seat in a first position;

Figure 2 shows the folding chair of figure 1 having the seat part in the second position;

Figure 3 shows a detailed view of the folding chair having the seat part in the second position;

Figure 4 shows the folding chair of the preceding figures while flipping the seat part;

Figure 5 shows a detailed view of the folding chair of the preceding figures, having the seat part in the first position;

Figure 6 shows the locking mechanism of the folding chair in detail;

Figure 7 shows the folding chair as a high chair;

Figure 8 shows the folding chair while taking away the table top;

Figure 9 shows a detailed view of the back rest of the folding chair; and

Figure 10 shows the table top of the high chair.

Figure 1 shows a folding chair 1 provided with a seat 2 which can be flipped or swung from a first position, as shown in this figure, into a second position shown in figure 2.

The folding chair 1 here has the seat part in the first position, wherein an axial line of the seat part 3 indicates the position of the seat part. The seat part can be swung or is rotatable about an axis of rotation 4. In the first position as shown here, the seat part abuts a stop 5 with the first seating surface 11 on top and the second seating surface 12 below.

A connection piece 13 connects the front legs 8 and the rear legs 8' to each other. This connection piece 13 provides a lower stop 5 and an upper stop 6, for forming a first stop for the seat part in the first position and a second stop for the seat part 2 in the second position.

The connection piece 13 is attached to the front chair leg by means of a bolt 4 wherein this attachment 4 also forms the point of rotation 4 for the rotatable or swingable seat. The folding chair is provided with a step 9. The

folding chair is shown here in the application of regular folding chair. The chair has a back rest 7.

Figure 2 shows the folding chair of figure 1, wherein the seat part 2 has been flipped or swung from the first position as shown in figure 1 into the second position as shown in this figure, so that now the second seating surface 12 is on top and the first seating surface 11 is below. The line 20 here forms the axial line of the seat part, wherein it can clearly be seen that the seat part has now arrived at a higher position, from a position shown with the dotted line 3, to a level shown with line 20, as a result of which the seat part has been elevated a quantity ΔH higher. The seat part is swung about point of rotation 4, wherein the points of rotation 4 are situated on the axis of rotation about which the seat part rotates.

Figure 3 shows a detail of the folding chair described above, wherein the seat part is in the second position. In this figure the connection piece 13 can clearly be seen, which connection piece is connected to the front leg 8 and to the rear leg 8' of the folding chair by means of a bolt 31 and a bolt 4, which is also the point of rotation of the seat part.

Bolt 31 is also a point of rotation with which the rear leg 8' can be folded against the front leg 8, which is indicated by arrow 32. In this position it can clearly be seen that the seating surface 12, which in figure 1 formed the lower side of the seat part, now forms the upper side.

The connection element 30 connecting the seat part 2 with the point of rotation 4 is also shown here. This connection element or seat fastening member 30 is rotatable between two lips of connection piece or first connection member 13.

The distances 33, 34 and 35 show the distances from the outside of the connection element 13 to the point of rotation. In these embodiments the

distances 33, 34 and 35 are almost equal, and each have the size of the distance from the point of rotation or axis of rotation 4 to the seat part 2. The edge of the connection element follows an arc of a circle. When flipping the seat part 2 follows said arc of a circle. As a result no fingers may get wedged between connection element 13 and the seat part 2.

In figure 4 it can be seen how the seat part 2 from the second position shown in figure 3 is flipped from the second position, as shown in figures 2 and 3, to the first position as shown in figure 1. In this figure the locking 10 can also be clearly seen, with which locking the seat part 2 is locked in the second position. It can also be seen that the seat part 2 follows the edge of connection element 13. The connection element 13 also forms the upper stop 6 and the lower stop 5.

In figure 4 it can clearly be seen how the seat part rotates about the axis of rotation, defined by both points of rotation 4, from the second position to the first position.

In figure 5 the result can be seen of the flipping of the seat part, wherein the seat part has now arrived in the first position, wherein the folding chair now serves as a chair.

This figure clearly shows that the distance to the point of rotation 4, considered on the seat part, here leads to a first part having a width L1 and a second part having a width L2. Because of the choice of the distance of the point of rotation with respect to the rear or front side of the seat part, a seat can be created which in the first position as shown here may serve as a regular chair seat, whereas in the second position the seat part is shorter, so that it may easily serve as a high chair or as steps.

The step 9 then serves as step or footrest, respectively.

Figure 6 shows the locking mechanism 10 for the seat part 2 in the second position in detail. In this embodiment a pin was chosen which can be pulled, resiliently, in the direction indicated with number 60, so that it can be put into and taken out of the hole in the seat part.

Figure 7 shows the folding chair 1 in its application as a high chair. Here a little table 70 has been disposed which has been hung in the back rest 7 by means of hooks 71. The seat part 2 has been put in the second position, so that the seat part forms a short seat suitable for a high chair. The step 9 now serves as footrest.

Figure 8 shows the converting of the folding chair from the application of high chair, as shown in figure 7, to the application of chair.

Here the little table 70 is flipped upward so that it can be detached from the back rest 7. The seat part 2 has also been swung from the second position to the first position, so that the seat part 2 first of all is positioned lower, and moreover the seat part 2 projects further so that it is suitable to be used as a chair.

When the little table 70 has been taken away and the seat part is not in the first position as shown in figure 8, but in the second position, wherein the seat part projects less far, the seat part is positioned such due to the choice of the point of rotation of the seat part, that in cooperation with the step 9 the folding chair 1 may now serve as steps.

Figure 9 shows a detail of the back rest 7, wherein a hole 90 arranged in the back rest can clearly be seen. The hole has a diameter 91.

Figure 10 shows the little table 70 in detail by which means the folding chair 1 can be converted into a high chair. The hooks 71 are inserted into the holes 90 of the back rest. The diameter, indicated by the little arrows and

shown over the entire path up to the line indicated by 101, is smaller than or equal to the diameter 91 of hole 90. In the arranged condition the planes 102 and 101 form stop surfaces on both sides of the back rest, because of which due to gravity the little table abuts and is stably arranged against both sides of the back rest. The distance 100 between the stop surfaces 101 and 102 almost equals the thickness of the back rest.

It will be clear that the above description is included to illustrate the operation of preferred embodiments of the invention, and not to limit the scope of the invention. Starting from the above elucidation many variations that fall within the spirit and the scope of the present invention will be evident to an expert.

Claims

1. Seating furniture provided with a frame and a seat part having a front edge, a rear edge, a first seating surface and an opposite second seating surface, which seat part is attached to the frame so as to be flippable from a first position, in which the first seating surface is in a position of use, to a second position, in which the second seating surface is in a position of use, and vice versa.

2. Seating furniture according to claim 1, wherein the seat part is flippable about an axis of rotation outside of the seat part.

3. Seating furniture according to claim 2, wherein the axis of rotation is situated outside of the plane of the seat part.

4. Seating furniture according to claim 2 or 3, wherein the projection of the axis of rotation is situated between the front edge and the rear edge.

5. Seating furniture according to claim 2, 3 or 4, wherein the projection of the axis of rotation is situated out-of-centre between the front edge and the rear edge.

6. Seating furniture according to claim 5, wherein the distance between the front edge and the axis of rotation is at least approximately twice as large as the distance between the rear edge and the axis of rotation.

7. Seating furniture according to any one of the preceding claims, provided with hinges on both sides of the seat part, each comprising a first fastening

member connected to the frame and a seat fastening member connected to the seat part.

8. Seating furniture according to claim 7, wherein the seat fastening member keeps the seat part spaced apart from the axis of rotation.

9. Seating furniture according to any one of the preceding claims, wherein the frame is provided with retaining means for keeping the seat part in the first and the second position.

10. Seating furniture according to claim 9, wherein the retaining means comprise a lower stop, positioned for in the first position abutting the first seating surface.

11. Seating furniture according to any one of the preceding claims 9 or 10, wherein the retaining means comprise an upper stop, positioned for in the second position abutting the second seating surface.

12. Seating furniture according to any one of the preceding claims 9-11, wherein the seat part is flippable about an axis of rotation outside of the plane of the seat part and the retaining means comprise a lower stop, positioned for in the first position abutting the first seating surface, and an upper stop, positioned for in the second position abutting the second seating surface, wherein the lower stop and the upper stop are positioned above each other and both on the same side of the plane of the seat part as the axis of rotation.

13. Seating furniture according to any one of the preceding claims 8-12 when provided with hinges, wherein the first fastening member has a width extending substantially perpendicular to the axis of rotation and on both sides thereof, and a depth extending substantially in line with the axis of rotation, wherein the first fastening member forms an upper stop on the one

side of the axis of rotation and a lower stop on the opposite side of the axis of rotation.

14. Seating furniture according to any one of the preceding claims 9-13, wherein the retaining means further comprise locking means for locking the seat part in the second position.

15. Seating furniture according to any one of the preceding claims, comprising hinges on both sides of the seat part, each comprising a first fastening member connected to the frame and a seat fastening member connected to the seat part, wherein the seat fastening member is shielded by the first fastening member.

16. Seating furniture according to claim 15, wherein the first fastening member comprises two lips in between which the seat fastening member is movably accommodated.

17. Seating furniture according to claim 15 or 16, wherein the first fastening member comprises an edge and the hinges each define a hinge axis of rotation, wherein the hinge axis of rotation is spaced apart from the edge, wherein the distance from the edge to the axis of rotation is such that the seat part tightly moves along the edge when flipping the seat part.

18. Seating furniture according to claim 17, wherein in the position of use the upper edge and the lower edge extend horizontally and form an upper stop surface and a lower stop surface, respectively, for the first and second seating surface, respectively.

19. Seating furniture according to any one of the preceding claims, wherein the seating furniture is a folding chair which with the seat part in the first position is a chair and with the seat part in the second position is a high chair.

20. Seating furniture according to claim 19, wherein the frame furthermore is provided with a back rest and a table that can be hooked into the back rest for offering a table to the seat part in the second position.

21. Seating furniture according to claim 20, wherein the table on both sides is provided with S-shaped hooks that can be hooked into holes in the back rest and which, when hooked into the back rest, form stops on both sides of the back rest.

22. Seating furniture according to any one of the preceding claims, wherein the seat part is substantially plate-shaped.

23. Seating furniture according to any one of the preceding claims, wherein the seat part in the first position and in the second position, when the seating furniture is in the position of use, is substantially horizontal.

24. Seating furniture according to any one of the preceding claims, wherein the frame comprises front legs which continue outside of the seat part and to which a back rest member has been attached, and rear legs that are hinged to the front legs from a position substantially parallel to the front legs to a position at an angle to the front legs.

25. Seating furniture according to claim 24, wherein the front legs and the rear legs are each hinged to a connection member.

26. Seating furniture according to claim 25, wherein the seat part is flippably connected with the hinge of the front legs or the hinge of the rear legs.

27. Seating furniture according to claim 26, wherein the connection member extends perpendicular outside of the hinge axis of rotation, and the seat part is connected for rotating about the circumference of the connection member.

28. Seating furniture according to claim 27, wherein the connection member in the position of use of the seating furniture comprises stop surfaces below and above the axes of rotation of the hinges, which stop surfaces in the first and the second position, respectively, of the seat part abut the first and second seating surface.

29. Seating furniture according to any one of the preceding claims, comprising a hinge for flippably fastening the seat part with the frame, which hinge defines an axis of rotation and outside of said axis of rotation, in the position of use of the seating furniture defines an upper stop surface and a lower stop surface below and above the axis of rotation, which stop surfaces in the first and second position, respectively, of the seat part abut the respective seat parts.

30. Folding chair that can be adapted from chair to high chair comprising a foldable frame, a seat part having a front edge, a rear edge, a first seat part and an opposite second seat part, which seat part is flippably attached to the frame about an axis of rotation outside of the seat part from a first position, in which the first seating surface is in a position of use, to a second position, in which the second seating surface is in a position of use, and vice versa, wherein the projection of the axis of rotation on the seat part is situated between the front edge and the rear edge, hinges on both sides of the seat part, each comprising a first fastening member connected to the frame and a seat fastening member connected to the seat part, wherein the seat fastening member spaces the seat part apart from the axis of rotation, and retaining means which comprise a lower stop, positioned for in the first position abutting the first seating surface, and an upper stop, positioned for in the second position abutting the second seating surface.

31. Folding chair according to claim 30, wherein the lower stop and the upper stop are positioned above each other and both on the same side of the

plane of the seat part as the axis of rotation.

32. Device comprising one or more of the characterising measures described in the description and/or shown in the drawings.

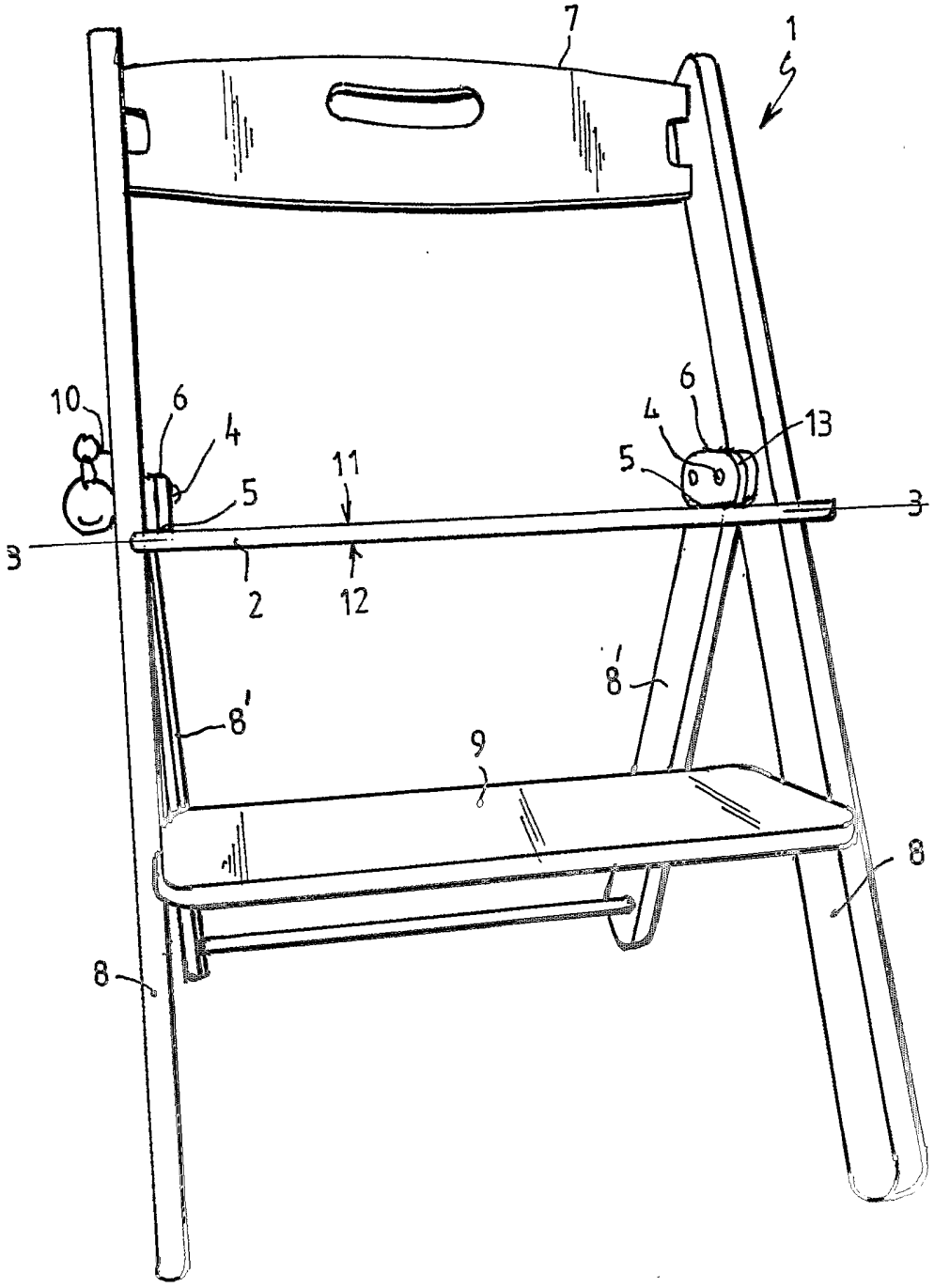


FIG.1

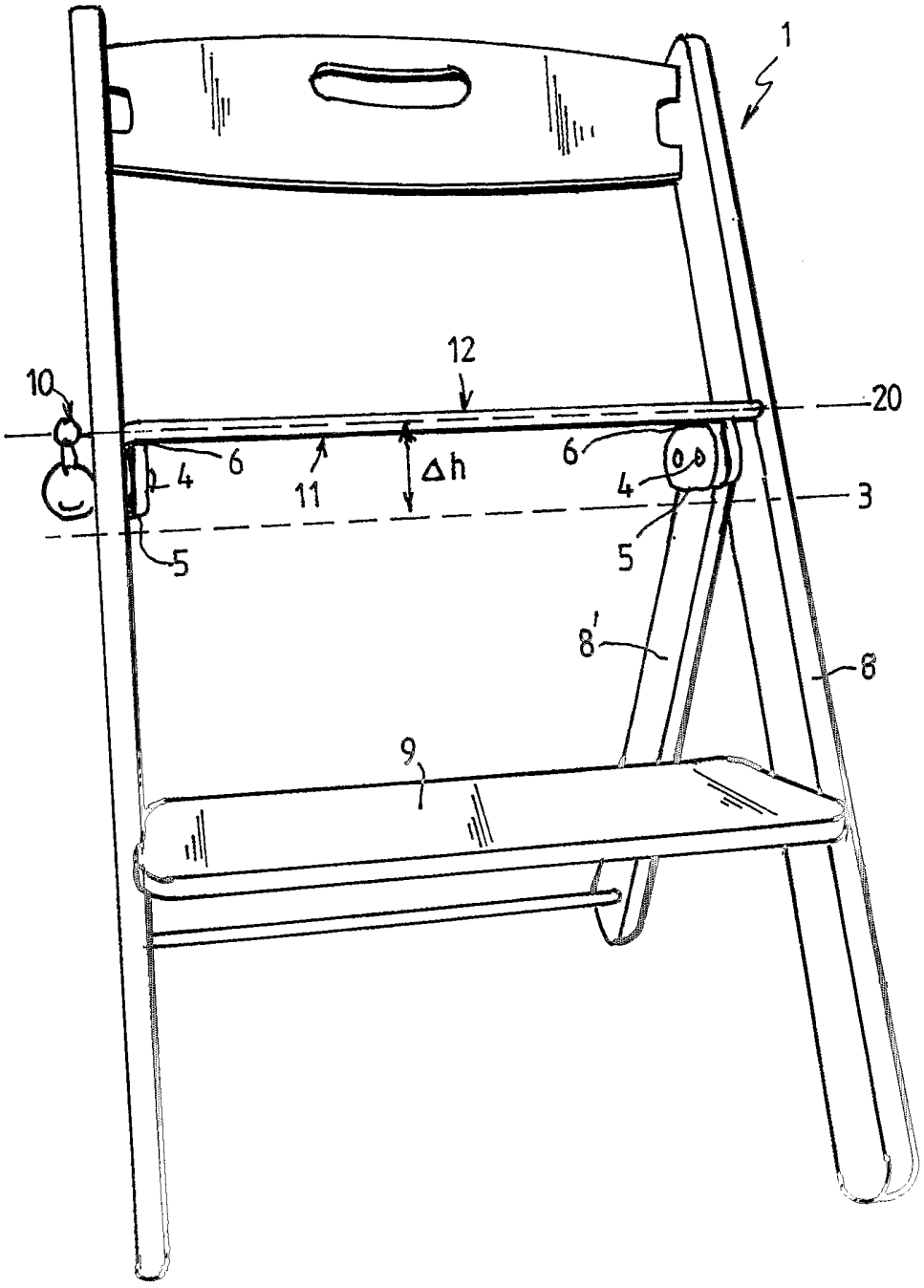


FIG. 2

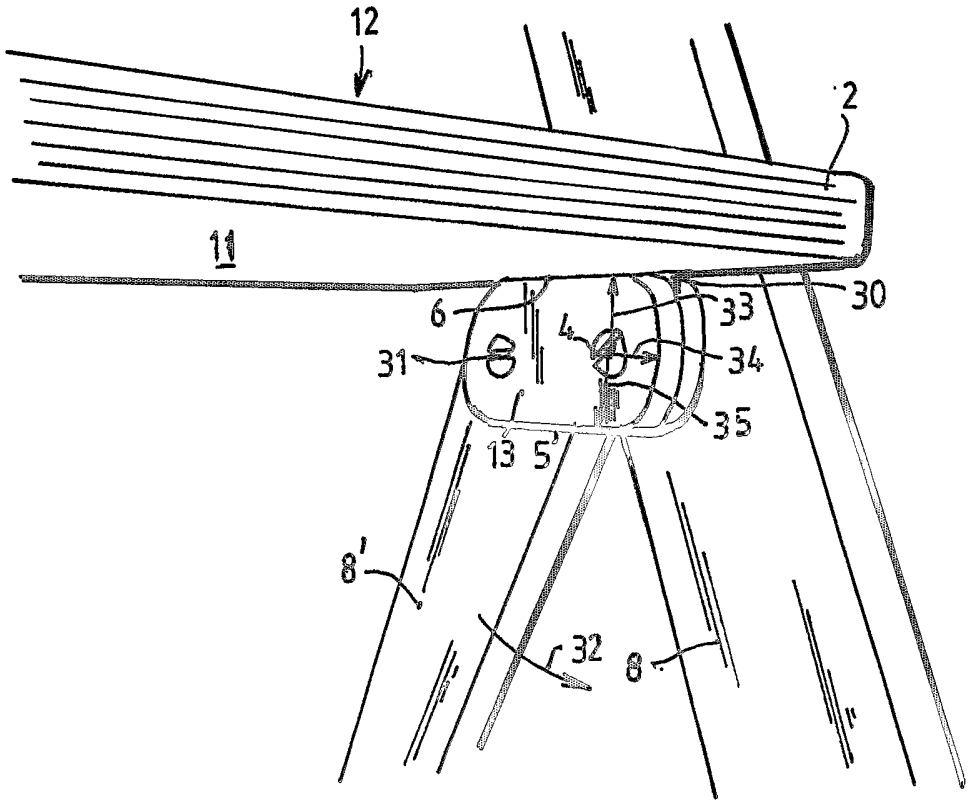


FIG. 3

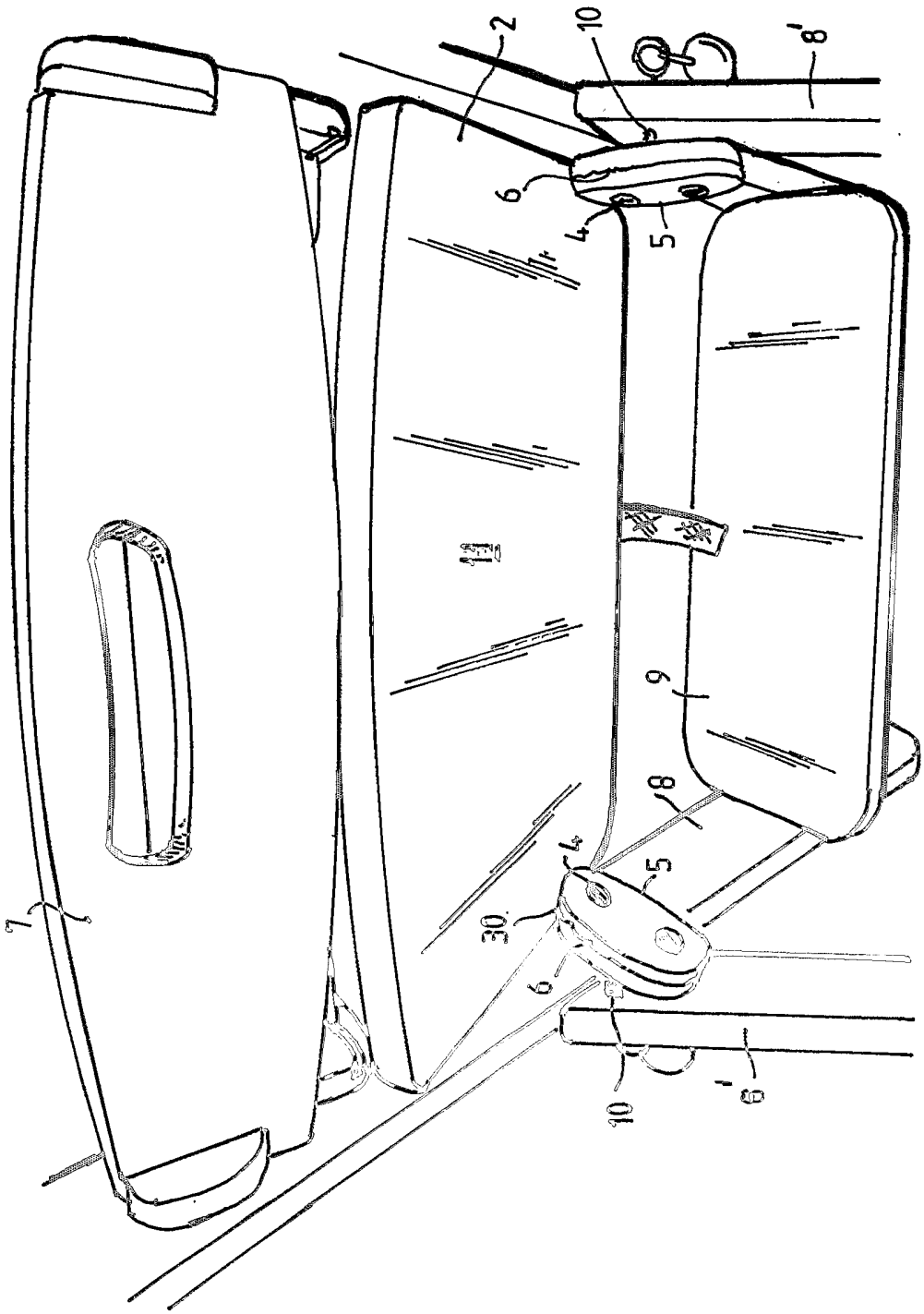


FIG.4

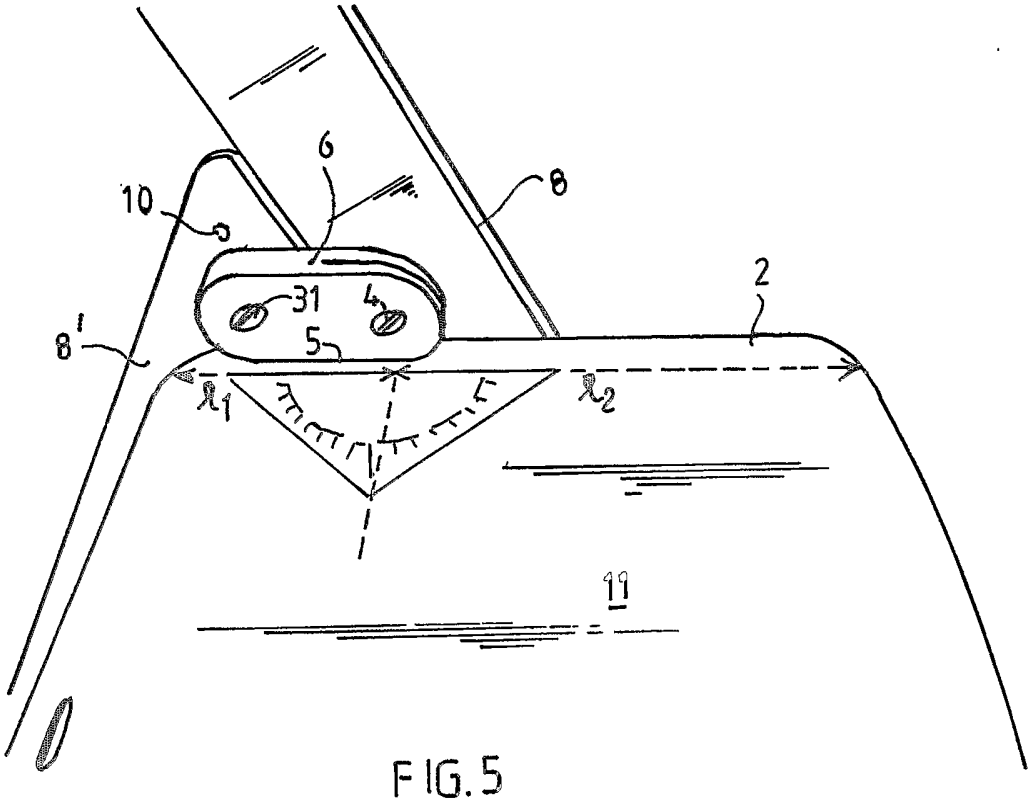


FIG.5

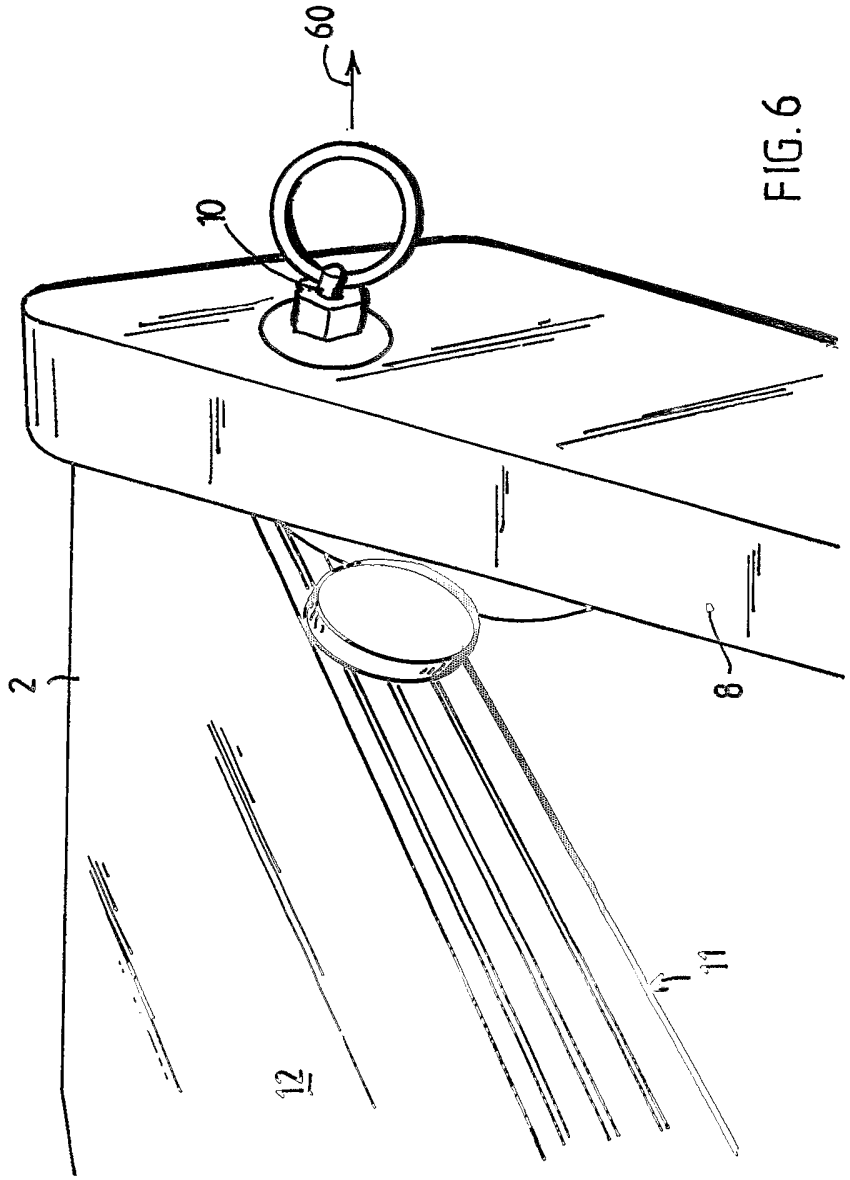


FIG.6

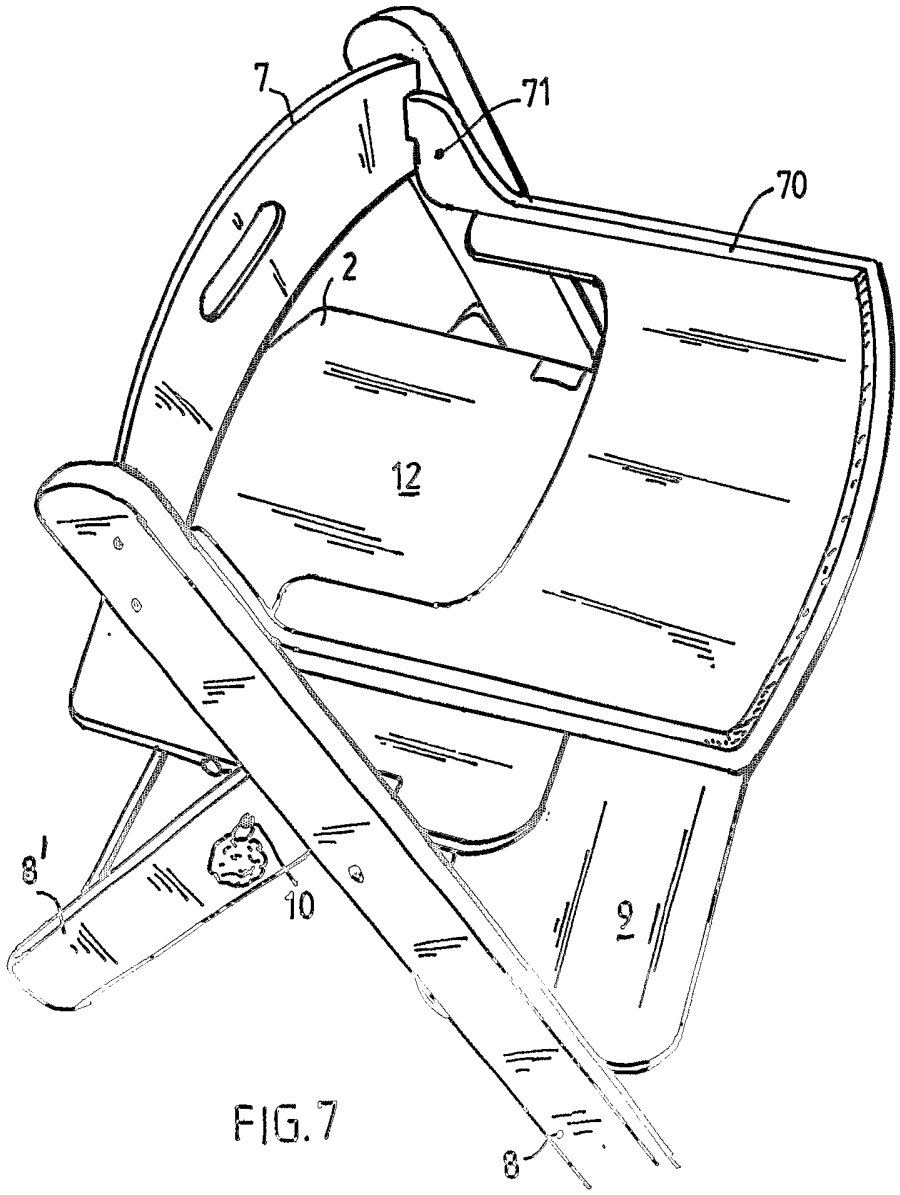


FIG.7

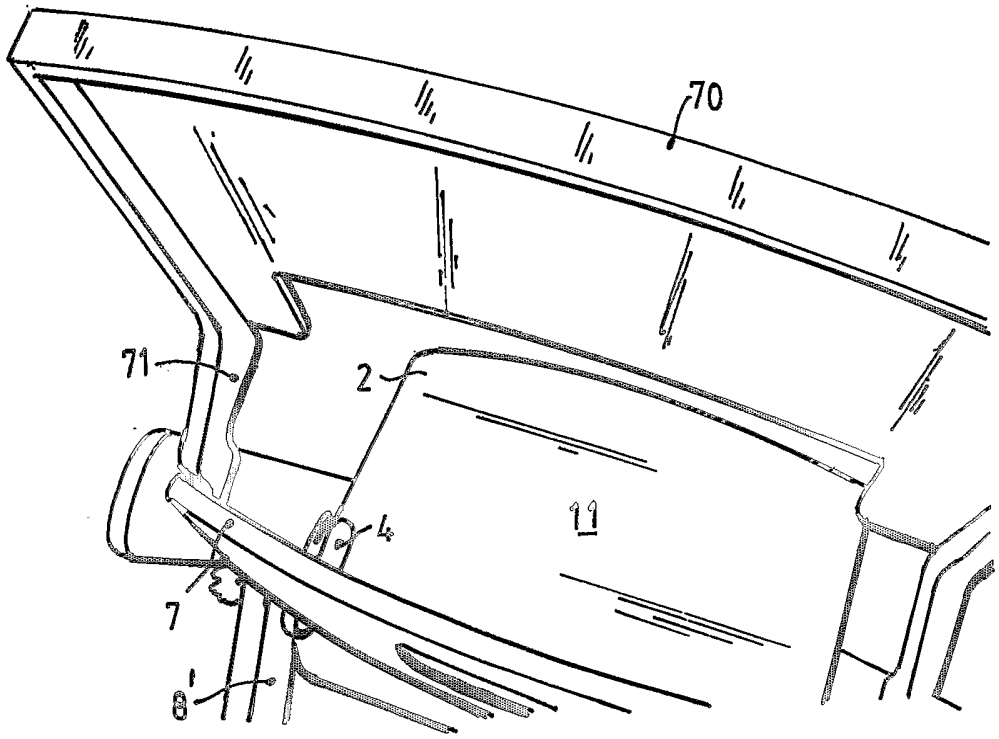


FIG.8

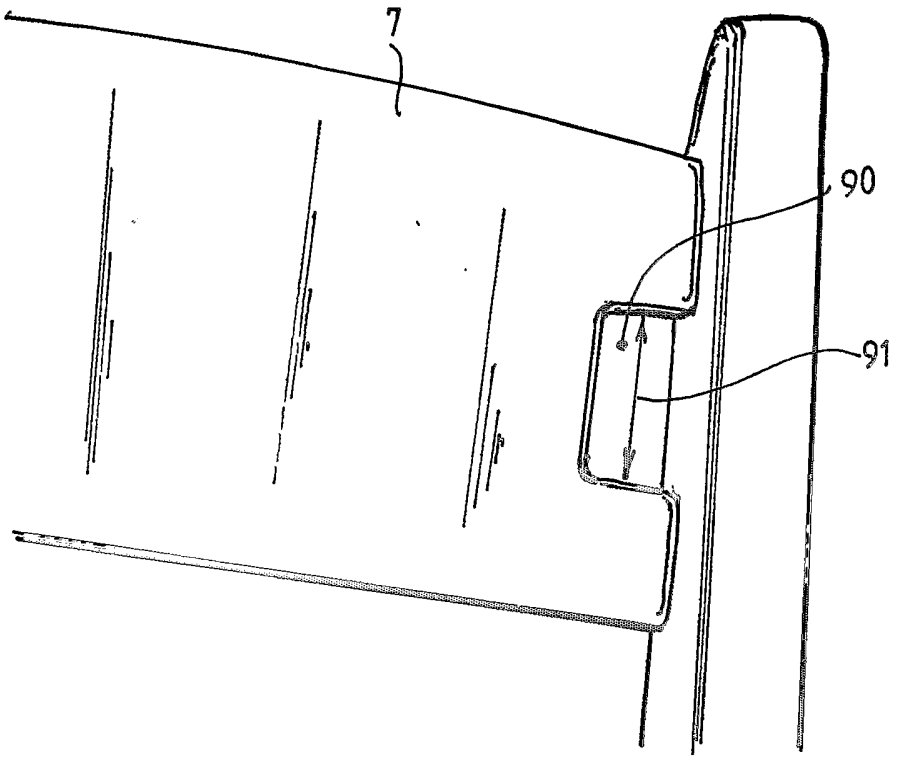


FIG. 9

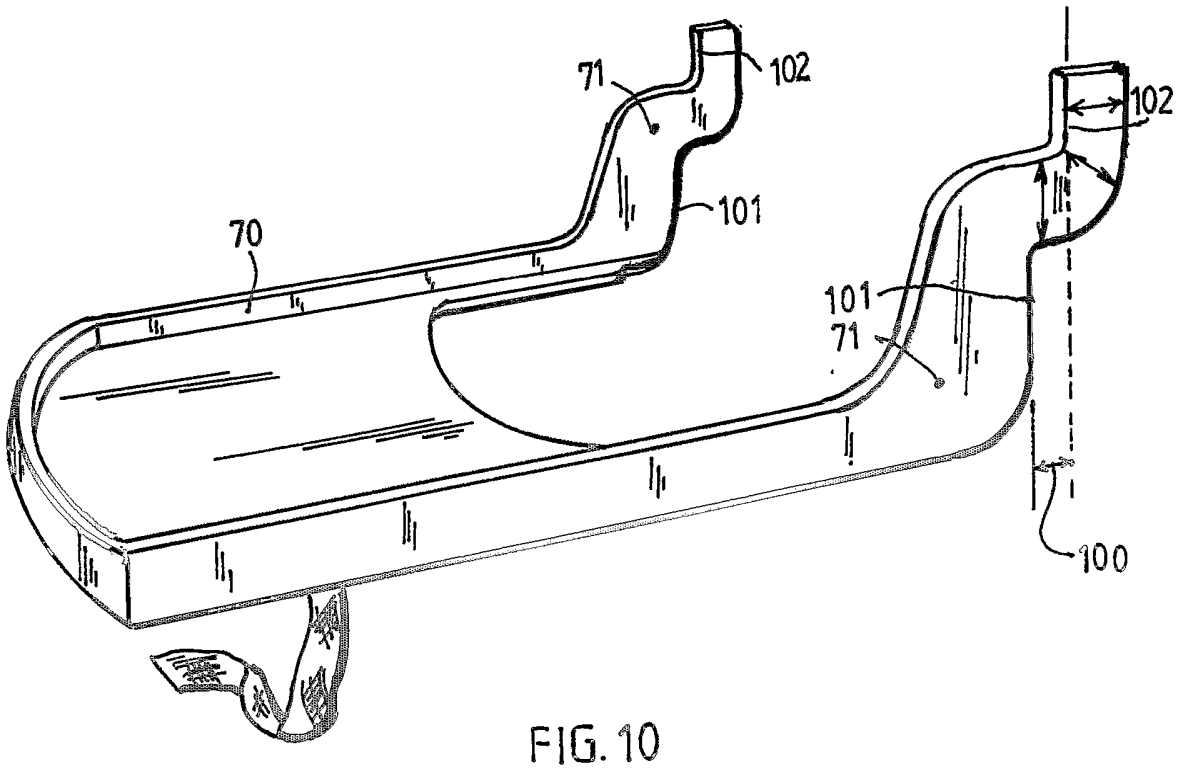


FIG. 10

INTERNATIONAL SEARCH REPORT

International Application No
.../NL2004/000509

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47C1/028 A47C3/20 A47D1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47C A47D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 269 892 A (HAMONIC JEAN PAUL) 5 December 1975 (1975-12-05)	1-14
A	pages 4-15; figures 1-13	19
X	FR 2 158 631 A (HAMONIC JEAN PAUL) 15 June 1973 (1973-06-15) the whole document	1-4,7-9
X	US 5 238 291 A (ALIONIS MARY K L) 24 August 1993 (1993-08-24)	1-3,7
A	column 2, line 50 - column 6, line 65; figures 1-8	16
A	DE 94 10 679 U (GEORG SCHARDT KG) 25 August 1994 (1994-08-25) page 13, lines 29-37 - page 16, lines 12-26; figures 1,2,5	16-19

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
5 November 2004	17/11/2004

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 31 32 096 A (THONET GEB GMBH) 3 March 1983 (1983-03-03) pages 6-7; figures 1,2	1

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INTERNATIONAL SEARCH REPORT

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