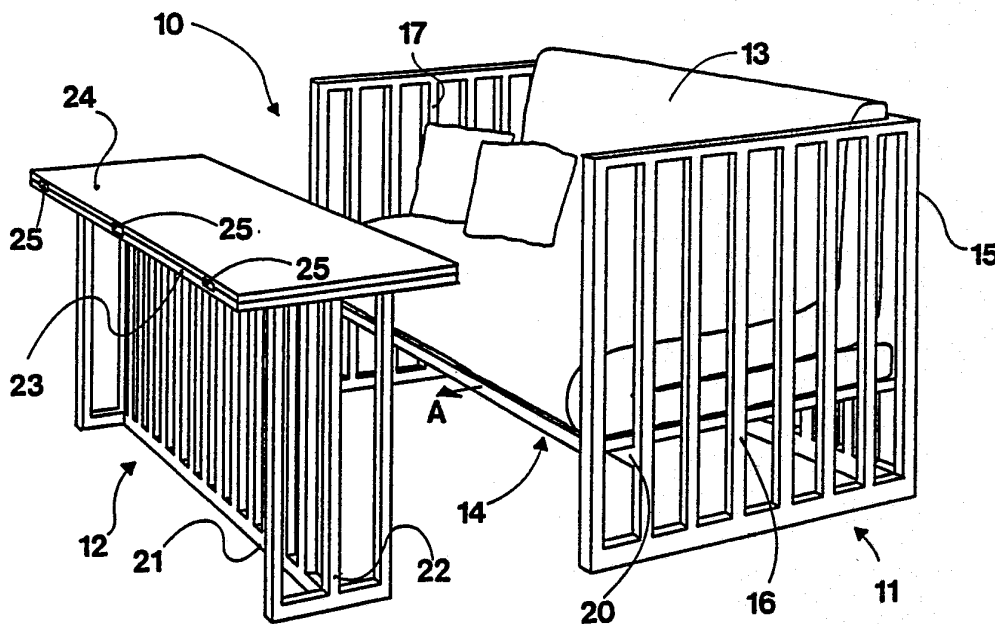




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/DK90/00254</p> <p>(22) International Filing Date: 3 October 1990 (03.10.90)</p> <p>(30) Priority data: 4869/89 3 October 1989 (03.10.89) DK</p> <p>(71)(72) Applicant and Inventor: HOLLINGSWORTH, Joe, Scott [US/DK]; Stefansgade 8, 4 tv., DK-2200 Copenhagen N (DK).</p> <p>(74) Agent: PLOUGMANN & VINGTOFT; Sankt Annæ Plads 11, DK-1250 Copenhagen K (DK).</p> <p>(81) Designated States: AT, AT (European patent), AU, BE (European patent), CA, CH, CH (European patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GB, GB (European patent), HU, IT (European patent), JP, KR, LU, LU (European patent), NL, NL (European patent), NO, SE, SE (European patent), SU, US.</p>		<p>Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i></p>

(54) Title: A FURNITURE COMBINATION INCLUDING A SEAT AND A TABLE WITH A TABLE TOP AND A SUPPORTING STRUCTURE

**(57) Abstract**

A set of furniture (10) comprises a sofa (11) and a table (12) having a table top (24) and a supporting part (22), said supporting part (22) defining at least two standing surfaces (21 and 28). When the supporting part (22) stands on a first of these standing surfaces (28), the upper surface of the table top (24) is placed approximately at a level corresponding to that of the seating part (14) of the sofa (11) and the upper surface of the table top (24) is placed at a level substantially above that of the seating part, when the supporting part (22) stands on the second of these standing surfaces (21). The sofa (11) is preferably covered with a futon (13) which is then used as a mattress by night. According to the invention an attractive set of furniture (10) is obtained comprising a sofa (11) with a coffee table (12), which can easily be converted into a piece of furniture for sleeping in (10') satisfying the requirements for a healthy bed.

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A FURNITURE COMBINATION INCLUDING A SEAT AND A TABLE WITH A
TABLE TOP AND A SUPPORTING STRUCTURE

The present invention relates to a set of furniture comprising a piece of furniture defining a seating surface
5 and a table having a table top and a supporting part.

Many single people, but also families, do not dispose of so much living space that it is practically possible to divide the area into particular bedrooms and living rooms. Thus, there is a requirement for furniture which can be
10 used both as living room furniture and as furniture for sleeping in. For this purpose a sofa bed is often used, which can both be used as a sofa and as a bed. A sofa bed is normally a single piece of furniture which by day functions as a sofa and by night as a bed which is formed in
15 various ways by changing the position or placing of the elements included in the set of furniture. Such furniture generally has the disadvantage that it is neither particularly good to sit in nor to sleep in. It is often difficult to change the arrangement from daytime to nighttime
20 position and vice versa, especially as a coffee table is usually placed in front of the sofa, said coffee table having to be removed and thereby taking up space elsewhere. Also, the architectural qualities usually leave much to be desired.

25 US 1.344.277 discloses a set of furniture of the type mentioned above comprising a long chair and a low table which form a supporting surface for a mattress when being put together, said mattress being furthermore used as upholstery for the chair. The long chair, which resembles a
30 chaiselongue, is not particularly appropriate, if a person wishes to sit with his legs bent and the extensions for the table legs described in the specification are both difficult to assemble, when the furniture is used as a chair and table, and superfluous when the set of furniture is used as
35 a bed.

A piece of furniture which can be used both as a sofa and as a bed is also known and for said furniture a so-called "futon" (will be explained later) is used as a mattress. Such a piece of furniture has the disadvantage that it is
5 very low when being used as a bed and at the same time it is not able to support the back of a person who wishes to sit up, for example to read.

The object of the present invention is to provide a set of furniture of the above type which provides good comfort
10 both in daytime and nighttime position, i.e. the set of furniture must be suitable for use as a sofa with a coffee table and at the same time said set of furniture must be constructed in such a way that it meets the contemporary requirements for a healthy bed and can be converted from
15 daytime to nighttime position in an easy and uncomplicated way. It is also an object of the invention to provide a set of furniture which can form a harmonious part of modern furnishings.

The set of furniture according to the invention is characterized in that the supporting part defines at least two
20 standing surfaces; the upper surface of the table top is placed at a level substantially corresponding to that of the seating part of the piece of furniture defining a seating surface, when the supporting part stands on a first
25 of these standing surfaces; and the upper surface of the table top is placed at a level substantially above that of the seating part, when the supporting part stands on a second of said standing surfaces.

It is hereby obtained that the same supporting part can be
30 used for the table top both when it is used as a table top and when it is used as a bed. It is thus easy to choose the desired level of the upper surface of the table top in both positions when dimensioning the supporting part.

The table top can be releasably mounted on, slidingly connected to or hinged to the supporting part. It is, however, preferred that there is a hinge connection between the table top and the supporting part so that the table top can be brought from a first position to a second position relative to the supporting part with a simple tilting movement, either before or after said supporting part is moved from a position where it uses the first standing surface to a position where it uses the second standing surface.

The set of furniture according to the invention is furthermore advantageously provided with a bridging member which is made to be placed in such a way that it is substantially horizontal, spans a gap between the piece of furniture defining a seating surface and the table top and is supported by both the supporting part of the table top and the piece of furniture defining a seating surface, when the supporting part stands on the first of the standing surfaces. When using such a bridging member, it is possible to construct a functional piece of furniture with a harmonious appearance.

The bridging member can be releasably mounted on, slidingly connected to or hinged to the table or the piece of furniture defining a seating surface, but in daytime position it is preferably placed on the piece of furniture defining a seating surface in such a way that it can be pulled out as a drawer or as an extension leaf when the set of furniture is to form a bed.

When the supporting part stands on the first standing surface, i.e. when the set of furniture is to be used as a bed, the table top together with the bridging member and the seating part of the piece of furniture defining a seating surface can form a supporting surface for a mattress which is preferably dimensioned so as to correspond substantially to the dimensions of the supporting surface.

When the supporting part is placed on the other standing surface, the mattress is made in such a way that it can be folded and arranged in a double layer on the seating part of the piece of furniture defining a seating surface and in
5 a single layer against the back part of the piece of furniture defining a seating surface. It is hereby achieved that the set of furniture can partly be used as a bed having the properties desired for a bed, partly as a sofa with a coffee table having a suitable height in relation to the
10 sofa. Furthermore, a very large freedom is obtained as to the design of the furniture so that a set of furniture according to the invention can be designed in a way which will be able to satisfy a very large part of the market.

It is particularly advantageous to use a so-called "futon"
15 to function partly as the upholstery of the piece of furniture defining a seating surface and partly as a mattress when the furniture is used as a bed. A futon is a mattress which usually consists of woven cotton. In recent years this type of mattress has become more and more widespread
20 in the Western world, as it has proved to be very comfortable to lie on and at the same time to provide a healthy support for a person's back. The mattress also has the advantage that it absorbs a large amount of the perspiration which is emitted from the body during the night so
25 that the bed will not appear moist. Traditionally the futon is placed on the floor, but combined with the set of furniture according to the present invention, it is achieved that the futon in daytime position is able to give off the absorbed amount of sweat so that the risk of mould growth
30 and the like is eliminated. The futon also has the advantage that it can be used by allergics.

The invention will be explained below in more detail with reference to the drawing, wherein

Fig.1 is a perspective view of a preferred embodiment of a

- set of furniture according to the invention in daytime position with a mattress placed on the sofa;
- Fig. 2 is a perspective view of the embodiment in Fig. 1 in nighttime position, a part of the mattress having been removed to show the details;
- Fig. 3 is a perspective view of a second embodiment in daytime position without a mattress;
- Fig. 4 is a perspective view of the embodiment in Fig. 3 in nighttime position;
- 10 Fig. 5 is a perspective view of a third embodiment in daytime position without a mattress;
- Fig. 6 is a perspective view of the embodiment in Fig. 5 in nighttime position;
- Fig. 7 is a perspective view of a fourth embodiment in daytime position without a mattress;
- 15 Fig. 8 is a perspective view of the embodiment in Fig. 7 in nighttime position;
- Fig. 9 is a perspective view of a fifth embodiment in daytime position without a mattress;
- 20 Fig. 10 is a perspective view of the embodiment in Fig. 9 in nighttime position;
- Fig. 11 is a perspective view of a sixth embodiment in daytime position without a mattress;
- Fig. 12 is a perspective view of the embodiment in Fig. 11 in nighttime position;
- 25 Fig. 13 is a perspective view of a seventh embodiment in daytime position; and
- Fig. 14 is a perspective view of the embodiment in Fig. 13 in nighttime position.
- 30 Fig. 1 shows a currently preferred embodiment of a set of furniture 10 according to the invention in daytime position, i.e. the position in which the set of furniture is placed when it is to be used as a sofa 11 with a coffee table 12. A futon 13 is placed inside the sofa 11, said futon being folded in such a way that it lies in a double layer on the seat 14 of the sofa 11 and in a single layer against the back 15 of the sofa 11. The frame of the sofa
- 35

11 comprises two side parts 16 and 17 in addition to the back part 15, said parts being firmly put together and all being designed to look like bars. The seating part 14 comprises two parts 18 and 19, of which said first part 18 is firmly mounted on the frame of the sofa 11, while the second part 19 is extensible in forward direction as shown by the arrow A in Fig. 1. The parts 18 and 19 are supported by a crossbeam 20, which also serves to stiffen the sofa 11.

10 The table 12 is placed in front of the sofa 11 and the table comprises a supporting part 22 which is also shaped as bars and which stands on a standing surface 21. The supporting part 22 supports a lower table top 23 which again supports an upper table top 24. The two table tops 23 and 24 are interconnected along the front longitudinal edge of these by means of three hinges 25.

In Fig. 2 the set of furniture 10 is shown in nighttime position, i.e. converted into a bed 10'. The conversion is obtained by folding out the table tops 23 and 24 via the hinges 25 and placing said table tops on an upper surface 27 of the supporting part 22, said supporting part having been placed in such way that a bottom surface 28 abuts on the floor. The extensible part 19 of the seating part 14 of the sofa 11 is then drawn out and the table 12 is positioned relative to the sofa 11 in such a way that the foremost part of the extensible part 19 is made to abut against the hindmost edge 29 of the table top 23 and at the same time said foremost part is supported by the upper surface 27 of the supporting part 22. By pulling forward the part of the futon 13 which is placed against the back part 15 of the sofa 11, the futon 13 is then brought to lie flat on the supporting surface thus formed. The conversion of the set of furniture is then concluded.

Figs. 3 and 4 show another embodiment of a set of furniture according to the invention. The sofa 11 is provided with

closed sides 16 and 17 and a closed back 15. Furthermore, the seating part 14 of the sofa 11 is deeper and only a single table top 23' is used which is slightly wider than the table top 23 in figs. 1 and 2. It is hereby possible to
5 obtain a bed of a suitable length by placing the table top 23' on the largest side of the supporting part 22' and then pulling out the extensible part 19 of the sofa 11.

Figs. 5 and 6 show a further embodiment of the set of furniture 35 according to the invention. In this embodiment
10 the table 12 comprises two table tops 23 and 24 which in daytime position are placed on top of each other in the same way as in Fig. 1. The table tops 23 and 24, however, are wider so that a bed of a suitable length can be obtained by placing the supporting part 22 of the table 12
15 on its largest side and placing the two table tops on top in such a way that the table top 24 is brought to abut on the seating part 14 of the sofa 11, said seating part being supported by a crossbeam 20'. Said crossbeam 20' is placed at the very front of the sofa 11 and the seating part 14 is
20 moved slightly backwards so that a supporting surface 36 for the table top 24 is formed along the front edge of the seating part 14.

Figs. 7 and 8 show a further embodiment of a set of furniture 40 according to the invention. In this embodiment the
25 table 12 in daytime position comprises a single, approximately square table top 42 and the supporting part of the table 12 is formed by two separate parts 44 and 45. In daytime position two other square table tops 41 and 43 are placed in a place of storage, e.g. under the extensible
30 part of the sofa. When converting the set of furniture from daytime position to nighttime position, the two separate supporting parts 44 and 45 are placed on their largest sides at a mutual distance approximately corresponding to the width of a table top. Furthermore, the table tops 41,
35 42 and 43 are displaced relative to the supporting part so

that the extensible part of the sofa can also rest on this supporting part.

Figs. 9 and 10 show a set of furniture 46 which corresponds to the set of furniture 40, but wherein the bridging member between the sofa 11 and the table 12 comprises two tops 47 and 48. In daytime position these tops together with the table top 42 form the table top for the coffee table 12. In daytime position the tops 41 and 43 are kept in a suitable place, e.g under the sofa.

10 Figs. 11 and 12 show a set of furniture 50, wherein the table 12 has a single table top 23, while the supporting part comprises two parts 51 and 52. When converting the set of furniture from daytime position to nighttime position, the two supporting parts 51 and 52 are placed on their
15 largest sides next to each other and the hindmost supporting part 51 is used partly to support the extensible part 19 of the sofa 11, partly to support the table top which is also supported by the foremost supporting part 52.

Figs. 13 and 14 show a set of furniture 55 which approximately corresponds to the set of furniture shown in Figs. 1
20 and 2. Whereas a relatively thick futon 13 is used in the embodiment shown in Figs. 1 and 2 in nighttime position, a relatively thin mattress 59 is used in the embodiment shown in Figs. 13 and 14. Said mattress, however, is placed on
25 top of three cushions 56, 57 and 58, of which the two in daytime position are used as seat cushions for the sofa, while the third cushion is used as a back cushion. These cushions can optionally be interconnected along their longitudinal edges by means of straps, not shown, or the
30 like.

As it appears from the drawing, the supporting surface for the mattress in the various embodiments often has a somewhat dissimilar structure and thereby a dissimilar flexibility. However, this is of no importance when a futon is

used as a mattress, as the properties of the futon make it impossible to feel the supporting surface through the mattress. Thus, the mattress is very "insensitive" towards irregularities in the supporting surface.

- 5 Alternatively, a relatively thin mattress of the futon type can be used, which can be rolled up during the day. This solution which is traditionally used in Japan, is combined with loose cushions in the sofa, said cushions being spread out on the supporting surface for the mattress when the
10 furniture is to be used as a bed, whereupon the thin mattress is rolled out on top of the cushions.

It is of course also possible to use other types of mattresses, but as described, a futon mattress will provide a number of advantages.

- 15 The set of furniture according to the present invention can be modified in various other ways than the ones shown and described above. Thus the side parts of the table frame can be closed and form part of the supporting surface for the mattress when the furniture is in nighttime position.
20 Futhermore, the table tops can be hinged to the supporting part. In embodiments where an extensible part is used, a hinge connection can alternatively be used between the two seating parts, optionally combined with spring elements to facilitate the conversion from daytime position to night-
25 time position and vice versa.

CLAIMS

1. A set of furniture comprising a piece of furniture defining a seating surface and a table having a table top and a supporting part,
5 c h a r a c t e r i z e d in that the supporting part defines at least two standing surfaces; the upper surface of the table top is primarily placed at a level corresponding to that of the seating part of the piece of furniture defining a seating surface, when the supporting part stands
10 on a first of these standing surfaces; and the upper surface of the table top is placed at a level substantially above that of the seating part, when the supporting part stands on a second of these standing surfaces.
2. A set of furniture according to claim 1,
15 c h a r a c t e r i z e d in that the table top is releasably mounted on, slidably connected to or hinged to the supporting part.
3. A set of furniture according to claim 1 or 2,
c h a r a c t e r i z e d in that it furthermore has a
20 bridging member which is made to be placed in such a way that it is substantially horizontal, spans a gap between the piece of furniture defining a seating surface and the table top and is supported by both the supporting part of the table top and the piece of furniture defining a seating
25 surface, when the supporting part stands on the first of the standing surfaces.
4. A set of furniture according to claim 3,
c h a r a c t e r i z e d in that the bridging member is releasably mounted on, slidably connected to or hinged to
30 the table or the piece of furniture defining a seating surface.
5. A set of furniture according to any of the preceding claims,

c h a r a c t e r i z e d in that the table top together with the bridging member and the seating part of the piece of furniture defining a seating surface can form a supporting surface for a mattress, when the supporting part stands
5 on the first standing surface.

6. A set of furniture according to any of the preceding claims,
c h a r a c t e r i z e d in that it comprises a mattress having dimensions approximately corresponding to the dimen-
10 sions of the supporting surface.

7. A set of furniture according to any of the preceding claims,
c h a r a c t e r i z e d in that the mattress is made in such a way that it can be folded and lie in a double layer
15 on the seating part of the piece of furniture defining a seating surface and in a single layer against the back part of the piece of furniture defining a seating surface.

8. A set of furniture according to claim 6 or 7,
c h a r a c t e r i z e d in that the mattress is a futon.

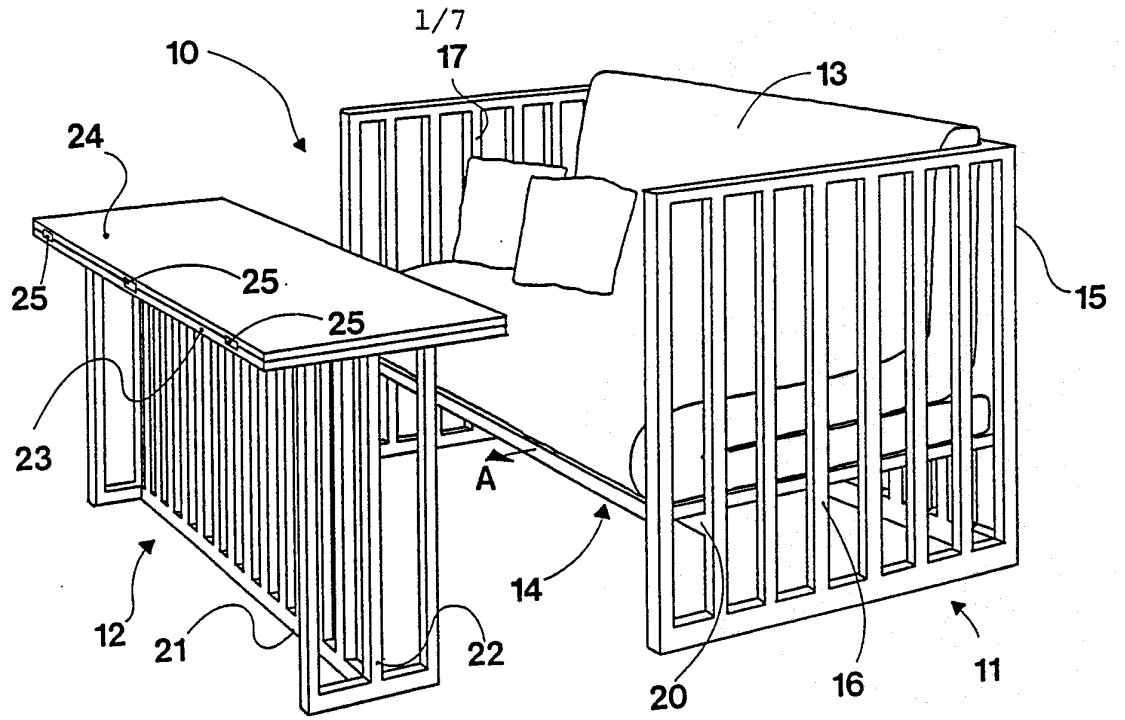


Fig. 1

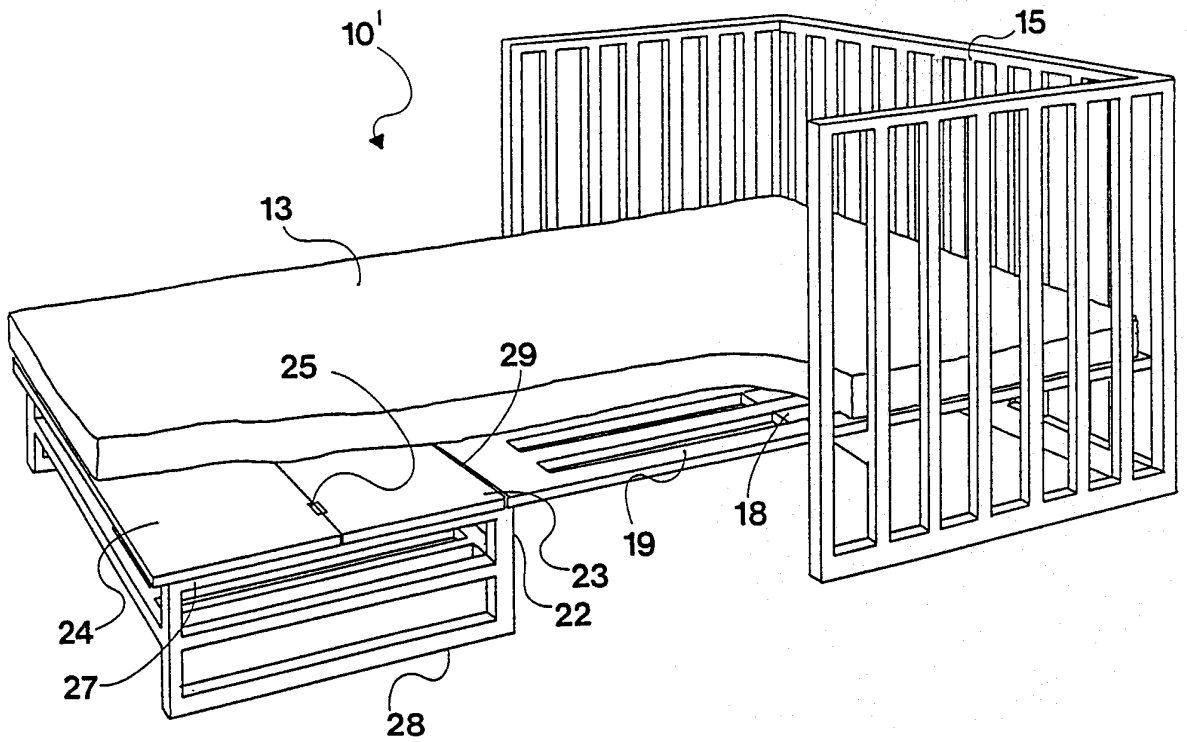


Fig. 2

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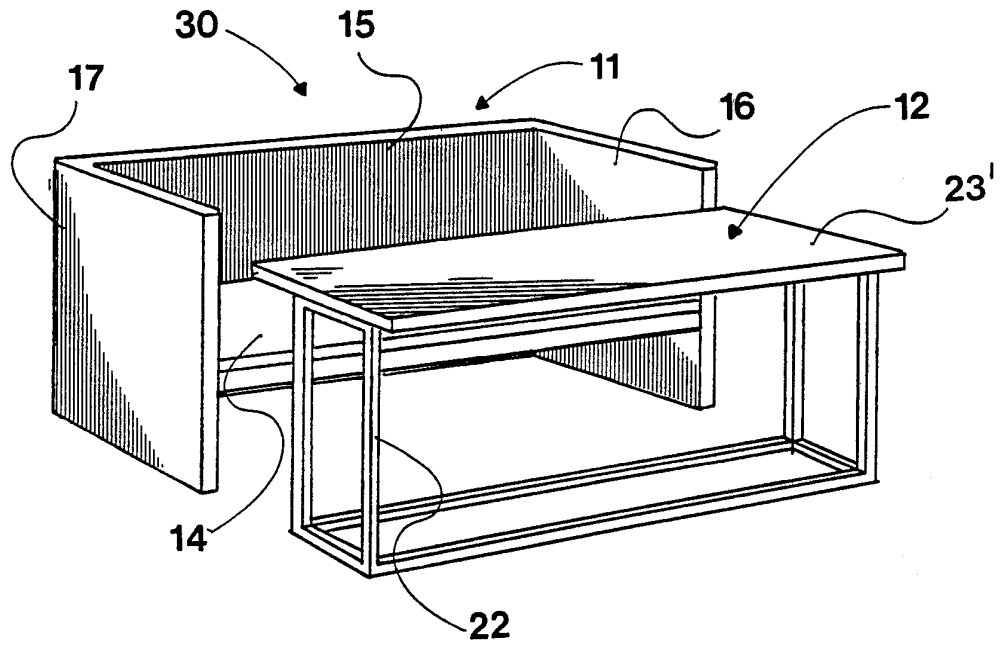


Fig. 3

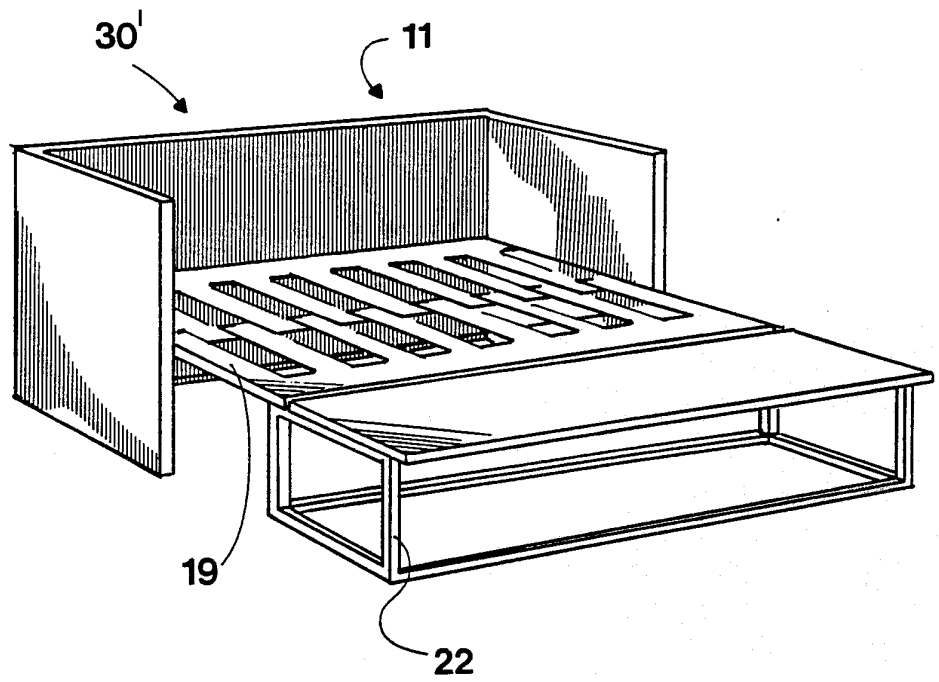


Fig. 4

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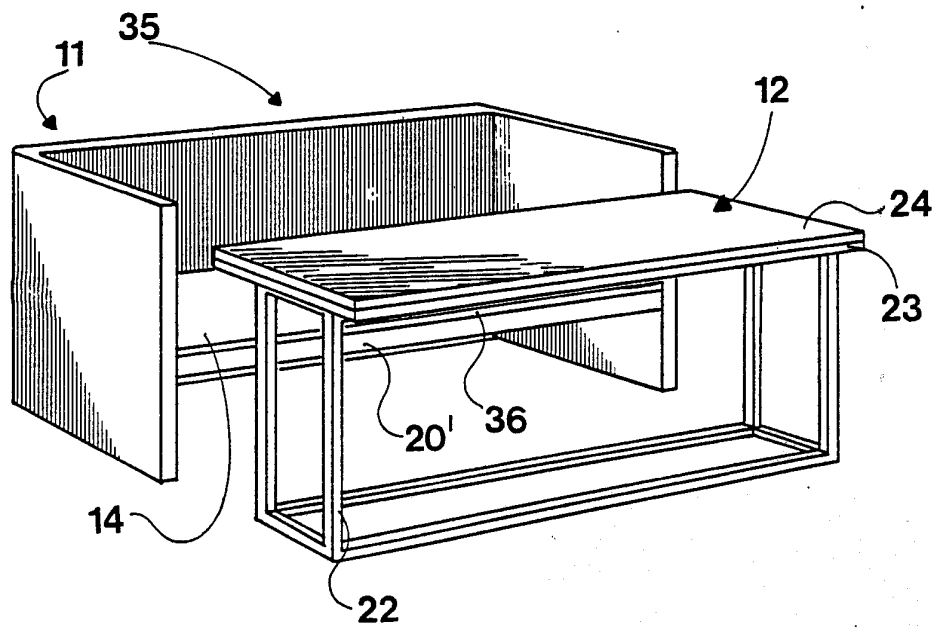


Fig. 5

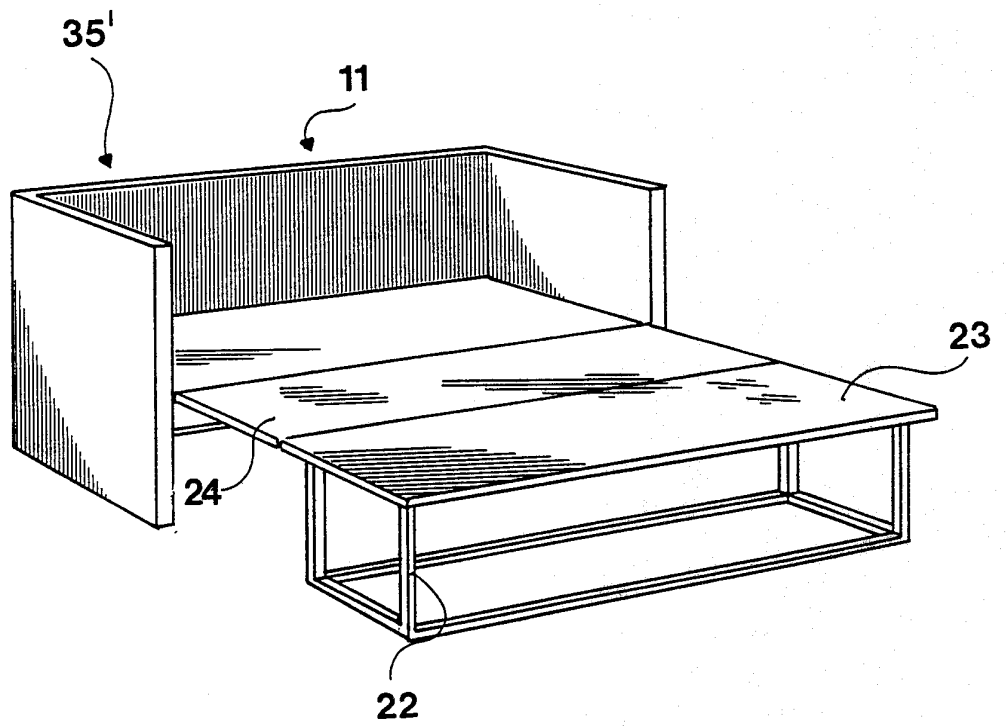


Fig. 6

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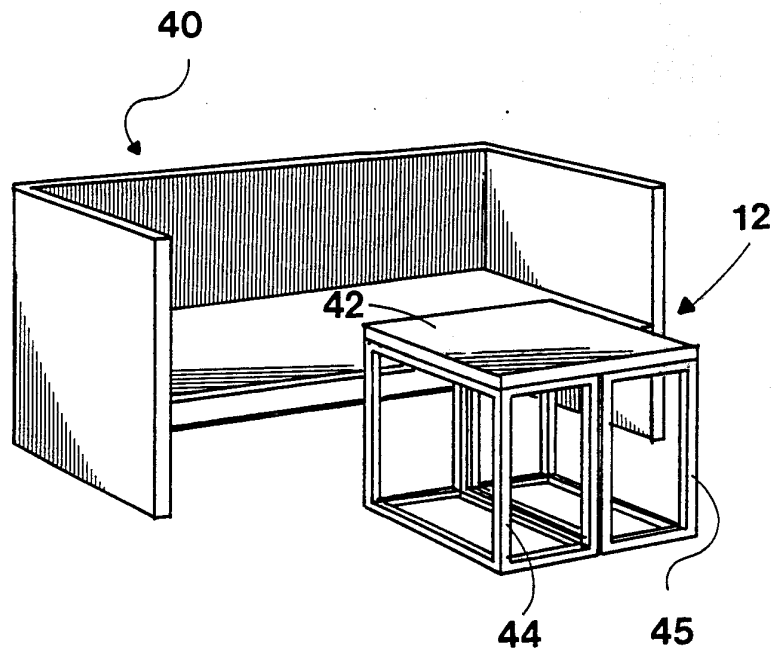


Fig. 7

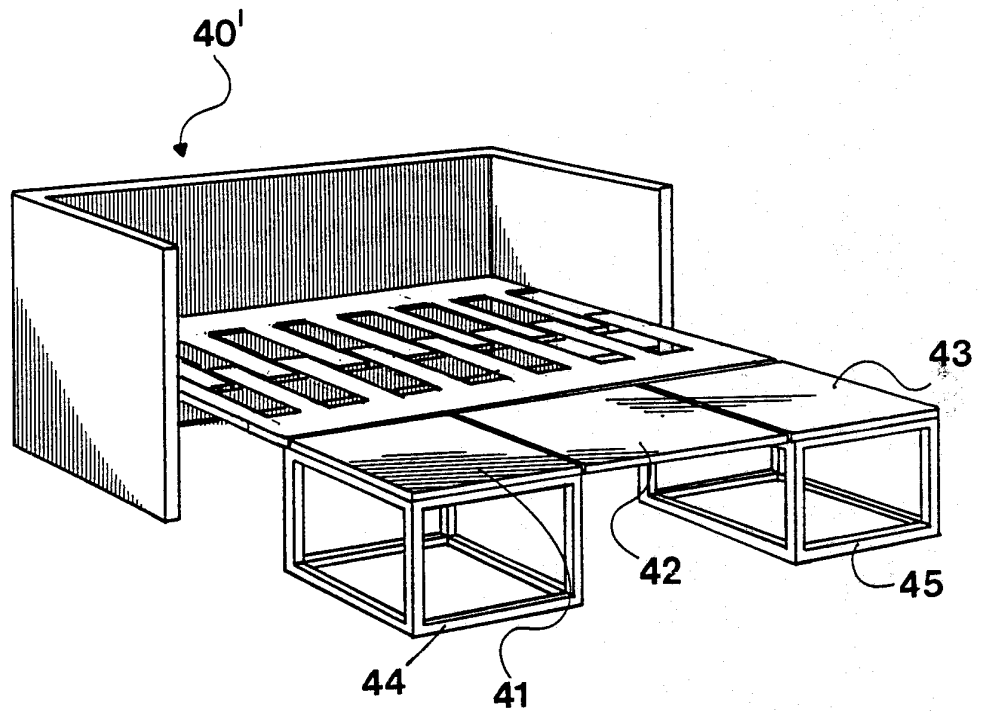


Fig. 8

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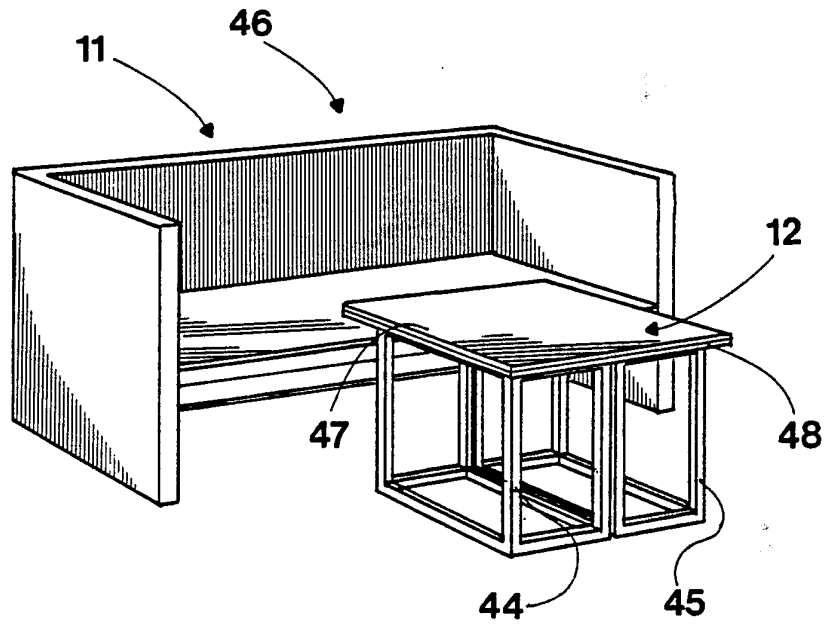


Fig. 9

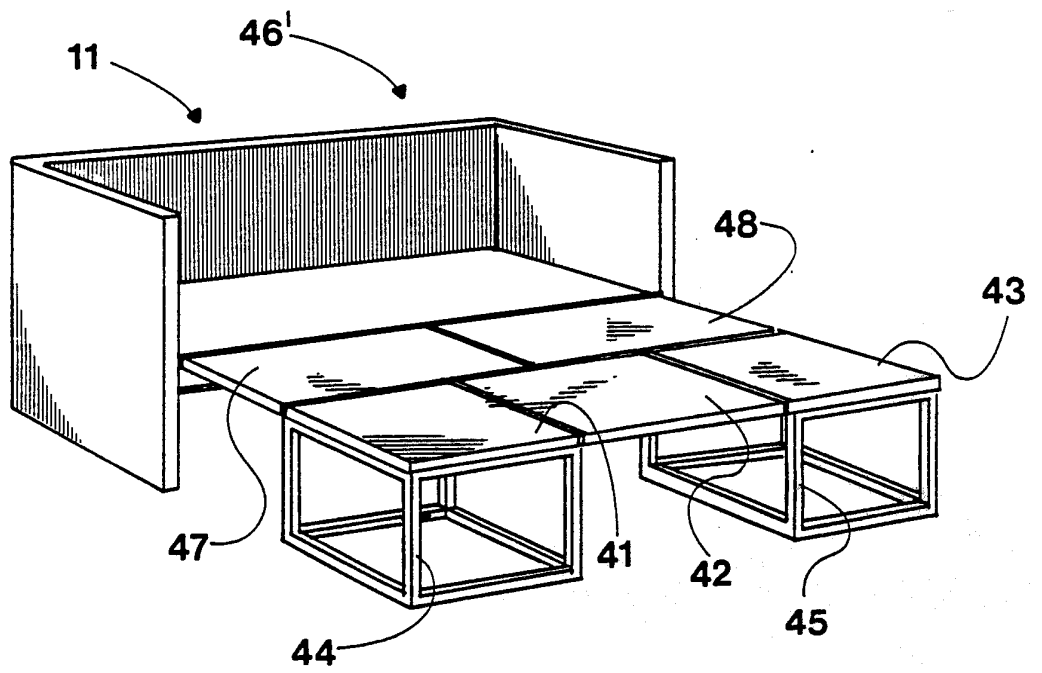


Fig. 10

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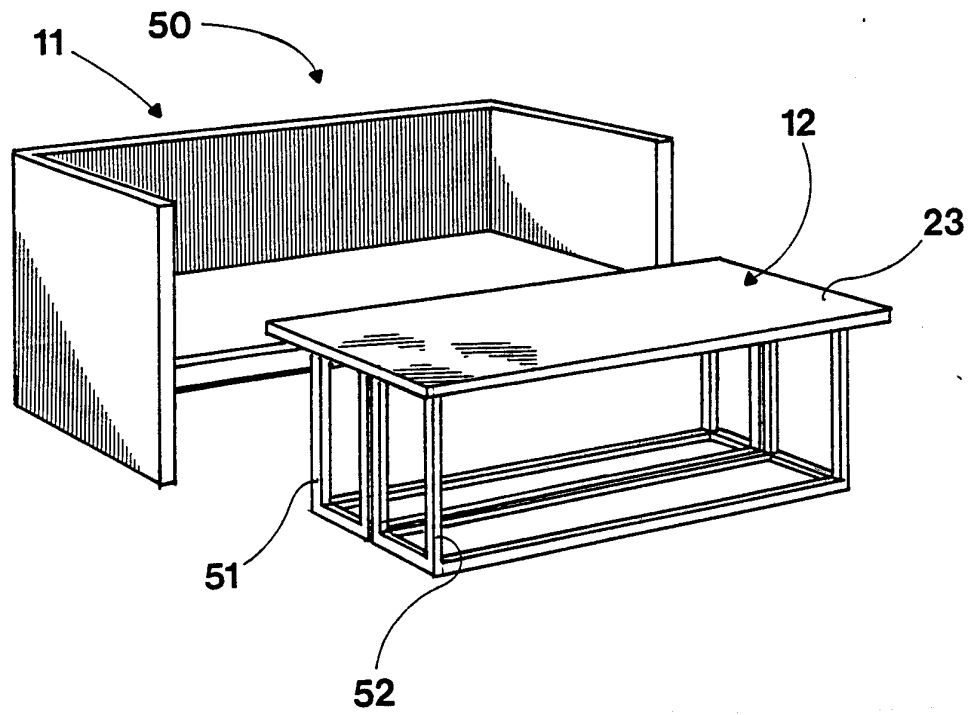


Fig. 11

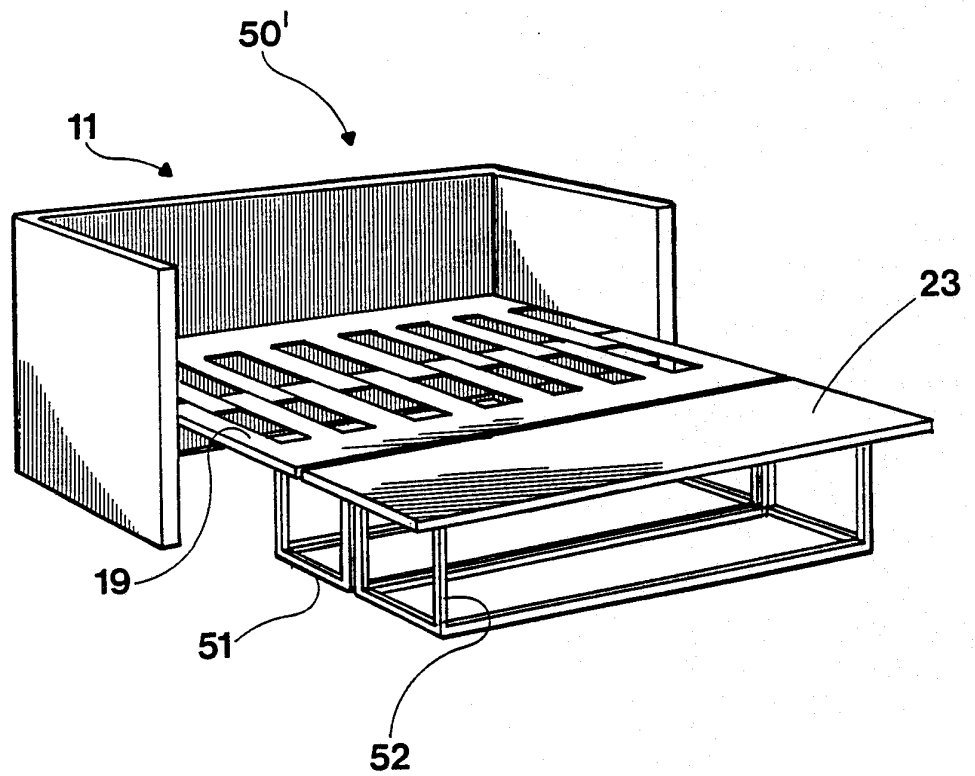


Fig. 12

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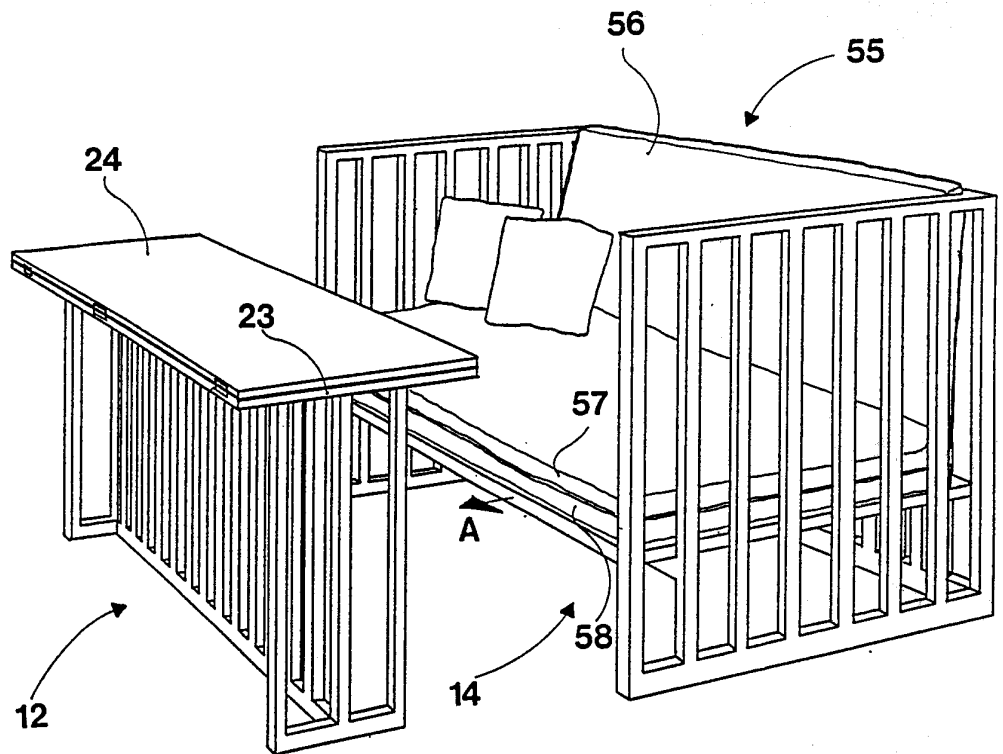


Fig. 13

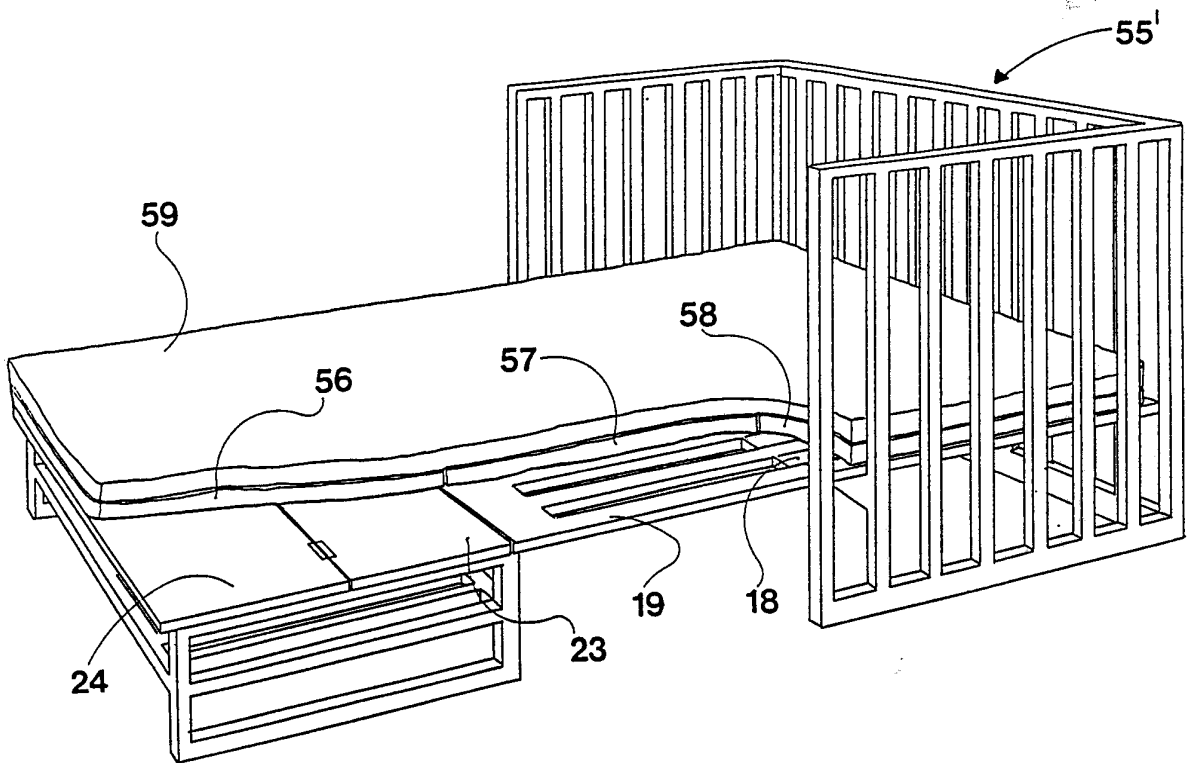
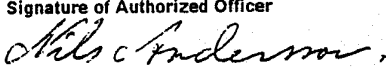


Fig. 14

INTERNATIONAL SEARCH REPORT

International Application No **PCT/DK 90/00254**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶				
According to International Patent Classification (IPC) or to both National Classification and IPC				
IPC5: A 47 C 17/62				
II. FIELDS SEARCHED				
Minimum Documentation Searched ⁷				
Classification System	Classification Symbols			
IPC5	A 47 B; A 47 C			
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched ⁸				
SE,DK,FI,NO classes as above				
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹				
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³		
A	EP, A2, 0182672 (CY HANCOCK) 28 May 1986, see figures 5,6 --	1		
A	US, A, 4392685 (LEONHART) 12 July 1983, see figures 3,4 -- -----	1		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>* Special categories of cited documents:¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </td> </tr> </table>			<p>* Special categories of cited documents:¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>
<p>* Special categories of cited documents:¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>			
IV. CERTIFICATION				
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report			
28th December 1990	1991 -01- 03			
International Searching Authority	Signature of Authorized Officer			
SWEDISH PATENT OFFICE	 Nils Andersson			

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.PCT/DK 90/00254

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the Swedish Patent Office EDP file on 90-11-28
The Swedish Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A2- 0182672	86-05-28	NONE	
US-A- 4392685	83-07-12	DE-A-C- 3002926	81-07-30
		FR-A-B- 2474292	81-07-31