

INFANT-CARE APPARATUS

The invention relates to infant-care apparatus in which an infant may be sat or laid down and particularly, but not exclusively, to a baby carriage or child safety seat for an automobile comprising such apparatus.

Typically, a baby carriage or child safety seat comprises such infant-care apparatus in the form of a so-called seat-type bed which has a hinged upper and lower body support portion so that it may be used as a seat or a cot.

An important consideration in the design of an infant-care apparatus (herein referred to as a nursing instrument) comprising a seat-type bed is safety for the baby or child. In order to improve such safety, the nursing instrument is generally provided with a seat-type bed which comprises not only a seat portion and a backrest portion for supporting the lower and upper halves of the baby's or child's body but a pair of side walls upwardly extending at least from both side edges of the backrest portion and a top wall upwardly extending from an upper edge of the backrest portion for coupling upper edges of the pair of side walls with each other. The seat portion, the backrest portion, the side walls and the top wall are covered with cushion members respectively, to provide

## REPLACED SHEETS SG

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preferable feeling for the baby.

The side walls are adapted to prevent the baby or child from sidewardly slipping or coming down from the seat-type bed, as well as to protect it against a side shock. On the other hand, the top wall is adapted to prevent the baby or child from upwardly slipping or coming down from the seat-type bed, as well as to protect it against a shock which may be applied to the baby's or child's head from above.

Such a nursing instrument is employed for a baby or child who is in a stage of remarkable cerebral development. Thus, it is necessary to protect the brain of such a baby or child with greater care as compared with an adult.

The backrest portion, the side walls and the top wall which are positioned around the baby's or child's head also effectively contribute to protection of its brain. In order to attain higher safety, however, the nursing instrument must be provided with countermeasures for safety, in consideration of various situations. For example, a baby carriage may run against some obstacle or overturn during movement. On the other hand, a baby or child chair, a cradle or a swing may collide with another child who runs about in the vicinity of such a nursing instrument. In a baby or child safety seat which is set



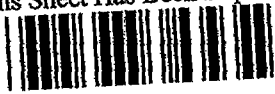
on an automobile, further, it is necessary to take into consideration an accident, which may cause a hardly expectable situation.

While the aforementioned cushion members allow  
5 preferable feeling for the baby or child, the portions covered with such cushion members may be so softened that the same cannot effectively cope with a severe shock.

#### SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to  
10 provide a seat-type bed for a nursing instrument, which can protect a baby's or child's head against a severe shock.

The present invention is directed to a seat-type bed for a nursing instrument which comprises a seat portion  
15 for supporting the lower half of a baby's or child's body, a backrest portion for supporting the upper half of the baby's or child's body, a pair of side walls upwardly extending from at least both side edges of the backrest portion, and a top wall upwardly extending from an upper  
20 edge of the backrest portion for coupling upper edges of the pair of side walls with each other. The seat portion, the backrest portion, the side walls and the top wall are covered with a cushion member respectively. In order to solve the aforementioned technical problem, the present  
25 invention has the following structure:



A second cushion member having a larger elastic coefficient than the aforementioned cushion member, i.e., a first cushion member, is arranged on a back side of the first cushion member only on parts of the backrest portion and the side walls, which can be in contact with the baby's or child's head, and on the top wall.

The aforementioned second cushion member may be arranged to be in contact with the first cushion member, while a third cushion member may be interposed between the first and second cushion members. In the latter case, the third cushion member preferably has an elastic coefficient which is larger than that of the first cushion member and smaller than that of the second cushion member.

According to the present invention, substantially only the first cushion member is deformed in an ordinary state, to provide preferable feeling for the baby.

When a severe shock is applied to the nursing instrument, on the other hand, the second cushion member is also deformed to effectively absorb the shock.

When the aforementioned third cushion member is arranged between the first and second cushion members, this third cushion member functions to compensate for the shock absorbing function provided by the second cushion member. In other words, the third cushion member may be deformed substantially with no deformation of the second



cushion member, or both of the second and third cushion members may be deformed, depending on the level of the shock.

According to the present invention, the second  
5 cushion member which can absorb a severe shock is arranged on portions which can be in contact with the baby's or child's head, whereby it is possible to sufficiently protect its head against a severe shock. In more concrete terms, the second cushion member is arranged on parts of  
10 the backrest portion and the side walls which can be in contact with the baby's or child's head and on the top wall, whereby the baby's or child's head is enclosed with regions provided with the second cushion member. Even if the baby's or child's head is slipped by a shock or of its  
15 own will, therefore, the action of the second cushion member can be exerted in any position. Therefore, it is possible to further improve safety of the nursing instrument comprising such a seat-type bed.

Further, the regions provided with the second cushion  
20 member are restricted to parts of the backrest portion and the side walls, and the top wall. Thus, it is possible to minimize increase in size of the seat-type bed which is brought by arrangement of the second cushion member in addition to the first cushion member.

25 When the third cushion member is arranged between the



first and second cushion members, it is possible to further improve reliability of the shock absorbing function.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5            Fig. 1 is a perspective view showing a baby carriage 2 as an exemplary nursing instrument to which an embodiment of the present invention is applied;

            Fig. 2 is a cross sectional view showing a seat-type bed 1 appearing in Fig. 1 through a backrest portion 4 and  
10          side walls 5 and 6;

            Fig. 3 is a longitudinal sectional view showing the seat-type bed 1 appearing in Fig. 1 through the backrest portion 4 and a top wall 7;

            Fig. 4 is a longitudinal sectional view corresponding  
15          to Fig. 3, illustrating the backrest portion 4 in a raised state;

            Fig. 5 is a cross sectional view corresponding to Fig. 2, showing a seat-type bed 1a according to another embodiment of the present invention;

20           Fig. 6 is a longitudinal sectional view corresponding to Fig. 3, illustrating the embodiment shown in Fig. 5;

            Fig. 7 is a longitudinal sectional view corresponding to Fig. 3, showing a seat-type bed 1b according to still another embodiment of the present invention; and

25           Fig. 8 is a longitudinal sectional view corresponding



to Fig. 3, showing a seat-type bed 1c according to a further embodiment of the present invention.

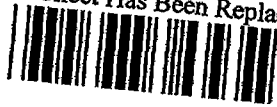
#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 is a perspective view showing a baby carriage 2 as an exemplary nursing instrument comprising a seat-type bed 1 according to an embodiment of the present invention. With reference to the baby carriage 2 shown in Fig. 1, the structure of the seat-type bed 1 which is of interest to the present invention is now described.

The seat-type bed 1 comprises a seat portion 3 for supporting the lower half of a baby's or child's body, and a backrest portion 4 for supporting the upper half of the baby's or child's body. A pair of side walls 5 and 6 upwardly extend from both side edges of the backrest portion 4. Further, a top wall 7 upwardly extends from an upper edge of the backrest portion 4. This top wall 7 couples upper edges of the pair of side walls 5 and 6 with each other.

Figs. 2 and 3 are sectional views showing the seat-type bed 1. Fig. 2 is a cross sectional view showing the seat-type bed 1 through the backrest portion 4 and the side walls 5 and 6, while Fig. 3 is a longitudinal sectional view showing the same through the backrest portion 4 and the top wall 7.

As shown in Figs. 2 and 3, the backrest portion 4,



the side walls 5 and 6 and the top wall 7 comprise holders 8, 9, 10 and 11 of a rigid material such as hard plastic for keeping these portions in shape. A facing 12 of cloth, for example, is adapted to cover front surfaces of the backrest portion 4, the side walls 5 and 6 and the top wall 7. A first cushion member 13 is arranged on the back side of the facing 12. This first cushion member 13 is made of a soft material having a relatively small elastic coefficient such as urethane foam or fiber aggregate, for example. The first cushion member 13 may alternatively be lined with the facing 12. The seat portion 3 also comprises a holder, a first cushion member and a facing (not shown).

The aforementioned structure is substantially similar to that in a conventional seat-type bed. This embodiment has the following additional structure:

Namely, second cushion members 14, 15, 16 and 17 are arranged on the back side of the first cushion member 13. These second cushion members 14, 15, 16 and 17 are positioned only on a part of the backrest portion 4 which can be in contact with the baby's or child's head 18 (Fig. 3), parts of the side walls 5 and 6 which can be in contact with the baby's or child's head 18, and on the top wall 7. The second cushion members 14 to 17 are made of a material having a larger elastic coefficient than the



first cushion member 13, such as a polyethylene beads foaming material, polystyrene foam or a urethane chip, for example.

5 The second cushion members 14 to 17 are preferably made larger in thickness than the first cushion member 13, to be improved in shock absorptivity. Further, the second cushion member 14 which is positioned on the backrest portion 4 is preferably stored in a concave portion 19 which is formed in the holder 8, to cause no steps on the  
10 first cushion member 13 and a portion of the facing 12 located thereon. The holders 9, 10 and 11 are also provided with concave portions 20, 21 and 22 having similar functions.

Fig. 4 is a longitudinal sectional view corresponding  
15 to Fig. 3, showing the backrest portion 4 which is raised as compared with the state shown in Fig. 3. When the backrest portion 4 is inclined as shown in Fig. 3 to provide a form of a bed, the top wall 7 is uprighted from the backrest portion 4. When the backrest portion 4 is  
20 raised as shown in Fig. 4, on the other hand, the top wall 7 extends to be flush with the backrest portion 4. Such a structure is currently employed in most of baby carriages, and a structure for automatically adjusting the condition of the top wall 7 in response to the angle of inclination  
25 of the backrest portion 4 is described in Japanese Patent

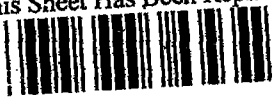


Publication No. 58-33148 or 58-33149 (1983), for example.

Also when the backrest portion 4 is raised as shown in Fig. 4, the second cushion member 14 or 17 provided on the backrest portion 4 or the top wall 7 and the second  
5 cushion members 15 and 16 (not shown in Fig. 4) provided on the side walls 5 and 6 can protect the baby's or child's head 18.

Figs. 5 and 6 are a cross sectional view and a longitudinal sectional view corresponding to Figs. 2 and  
10 3, respectively, showing a seat-type bed 1a according to another embodiment of the present invention. Referring to Figs. 5 and 6, elements corresponding to those shown in Figs. 2 and 3 are denoted by similar reference numerals, to omit redundant description.

15 According to this embodiment, a third cushion member 23 is arranged between a first cushion member 13a and second cushion members 14a, 15a, 16a and 17a. This third cushion member 23 is so arranged as to cover the overall back surface of the first cushion member 13a. The third  
20 cushion member 23 is made of a material having an elastic coefficient which is larger than that of the first cushion member 13a and smaller than that of the second cushion members 14a, 15a, 16a and 17a. Materials for the first cushion member 13a, the second cushion members 14a, 15a,  
25 16a and 17a and the third cushion member 23 may be



prepared in a combination of urethane foam, a polyethylene beads foaming material and a urethane chip, a combination of fiber aggregate, polystyrene foam and urethane foam, or a combination of fiber aggregate, a urethane chip and  
5 urethane foam, for example.

Fig. 7 is a longitudinal sectional view corresponding to Fig. 3, showing a seat-type bed 1b according to still another embodiment of the present invention. Referring to Fig. 7, elements corresponding to those shown in Fig. 3  
10 are denoted by similar reference numerals, to omit redundant description.

In the embodiment shown in Fig. 7, a third cushion member 23b is arranged between a first cushion member 13b and second cushion members 14b and 17b. Schematically,  
15 the third cushion member 23b is arranged to be distributed only in regions provided with the second cushion members 14b and 17b. More strictly, the third cushion member 23b is so sized as to somewhat jut out beyond a lower edge of the second cushion member 14b, and a step 24 is provided  
20 on a holder 8b for absorbing the thickness of the third cushion member 23b.

This embodiment is adapted to arrange the third cushion member 23b only in regions for receiving a baby's or child's head 18. Such a third cushion member 23b may  
25 be arranged to extend toward parts of side walls 5 and 6



which can be in contact with the baby's or child's head 18, similarly to the third cushion member 23 shown in Fig. 5, although such arrangement is not shown in Fig. 7.

5 Fig. 8 is a longitudinal sectional view corresponding to Fig. 3, showing a seat-type bed according to a further embodiment of the present invention. Referring to Fig. 8, elements corresponding to those shown in Fig. 3 are denoted by similar reference numerals, to omit redundant description.

10 According to this embodiment, a third cushion member 23c is arranged between a first cushion member 13c and a second cushion member 14c. Schematically, the third cushion member 23c is arranged to be distributed only in a region provided with the second cushion member 14c. More  
15 strictly, the third cushion member 23c is so sized as to somewhat jut out beyond upper and side edges of the second cushion member 14c respectively, and steps 25 and 26 are provided on a holder 8c for absorbing such thicknesses of the third cushion member 23c.

20 According to this embodiment, the third cushion member 23c is arranged only in regions having high possibilities of being in contact with a baby's or child's head 18.

While the respective thicknesses of the first, second  
25 and third cushion members are shown in Figs. 2 to 8, these



thicknesses can be arbitrarily changed at desire.

While the above description has been made with respect to an embodiment comprising first and second cushion members and those comprising first, second and  
5 third cushion members, the cushion members may be provided in a larger number of layers.

The operations of the backrest portion 4 and the top wall 7 shown in Figs. 3 and 4 are not requisite for the present invention. In other words, the present invention  
10 is also applicable to a nursing instrument comprising the backrest portion 4 and the top wall 7 which are fixed in the mode shown in Fig. 3.

Further, the present invention is not restricted to the aforementioned baby carriage, but is also applicable  
15 to another nursing instrument such as a baby or child chair, a cradle, a swing, or a baby or child safety seat for an automobile.



WHAT IS CLAIMED IS:

1. A seat-type bed for a nursing instrument,  
comprising:

a seat portion (3) for supporting the lower half of a  
baby's or child's body;

5 A backrest portion (4) for supporting the upper half  
of said baby's or child's body;

a pair of side walls (5, 6) upwardly extending from  
at least both side edges of said backrest portion (4);

10 a top wall (7) upwardly extending from an upper edge  
of said backrest portion (4) and coupling upper edges of  
said pair of side walls (5, 6) with each other;

a first cushion member (13) covering said seat  
portion (3), said backrest portion (4), said side walls  
(5, 6) and said top wall (7); and

15 a second cushion member (14, 15, 16, 17) being  
arranged on a back side of said first cushion member (13)  
only on parts of said backrest portion (4) and said side  
walls (5, 6) capable of being in contact with said baby's  
or child's head (18) and on said top wall (7), said second  
20 cushion member (14, 15, 16, 17) having a larger elastic  
coefficient than said first cushion member (13).

2. A seat-type bed for a nursing instrument in





accordance with claim 1, further comprising a holder (8, 9, 10, 11) being arranged on a back side of said first and second cushion materials (13, 14 to 17) for keeping said  
5 backrest portion (4), said side walls (5, 6) and said top wall (7) in shape, said holder (8 to 11) being formed with a cavity (19, 20, 21, 22) for receiving said second cushion member (14 to 17).

3. A seat-type bed for a nursing instrument in accordance with claim 1, wherein said first cushion member (13) contains urethane foam or fiber aggregate, and said second cushion member (14 to 17) contains a urethane chip,  
5 a polyethylene beads foaming material or polystyrene foam.

4. A seat-type bed for a nursing instrument in accordance with claim 1, wherein said second cushion member (14 to 17) is larger in thickness than said first cushion member (13).

5. A seat-type bed for a nursing instrument in accordance with claim 1, further comprising a third cushion member (23) being interposed between said first cushion member (13a) and said second cushion member (14a, 15a, 16a, 17a), said third cushion member (23) having an  
5 elastic coefficient being larger than that of said first





cushion member (13a) and smaller than that of said second cushion member (14a to 17a).

6. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said third cushion member (23) is arranged to extend along the overall back surface of said first cushion member (13a).

7. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said third cushion member (23b) is arranged only on parts of said backrest portion (4) and said side walls (5, 6) capable of being in contact with said baby's or child's head (18) and on said top wall (7).

8. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said third cushion material (23c) is arranged only on a part of said backrest portion (4) capable of being in contact with said baby's or child's head (18).

9. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said first, second and third cushion members (13a, 14a to 17a, 23) contain urethane foam, a polyethylene beads foaming material and a





urethane chip respectively.

10. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said first, second and third cushion members (13a, 14a to 17a, 23) contain fiber aggregate, polystyrene foam and urethane foam respectively.

11. A seat-type bed for a nursing instrument in accordance with claim 5, wherein said first, second and third cushion members (13a, 14a to 17a, 23) contain fiber aggregate, a urethane chip and urethane foam respectively.

12. A seat-type bed for a nursing instrument in accordance with claim 1, wherein said nursing instrument is a baby carriage.

13. Infant-care apparatus in which an infant may be sat or laid down, said apparatus comprising an upper body support portion, a lower body support portion, wall members disposed about a free end region of said upper body support portion, a first cushioning material which substantially covers said upper body support portion and said wall members, and a second cushioning material which has a larger modulus of elasticity than said first cushioning material disposed between said first cushioning material and at least one of said upper body support portion and said wall members to selectively cover areas thereof which are adjacent an infant's head in use of the apparatus.

