

SAFETY BOW FOR A CHILDREN'S CHAIR

The present invention concerns a safety bow for a children's chair, such as a chair for wherein the seat plate has a vertical hole in front, possibly with the potential of vertical
5 and horizontal adjustment of the seat plate. Further, the invention concerns the use of a safety bow in a children's chair.

Background of the Invention

It is well known that children, that is children such as in the age from when they may sit by themselves (about 6-7 month) until they master sitting safely in a children's chair
10 without falling out (about 2 years), need safety equipment hindering them from falling out of a children's chair.

Blockings are often used, such as bows or crossbars, possibly combined with a vertical strap or bar in children's chairs for this objective. Possibly, the entire seat of the chair may be shape moulded as a seat with integrated cross bow and crotch bar. The disadvantage
15 with shape moulded chairs is that the seat may not be adjusted in relation to the size and age of the child. Often, such physical blocks in the seat are combined with a harness in order to secure the child from climbing out of the chair. However, a physical block may be used alone when the child is so small that it is unable to climb out, or to provide extra physical support that a harness may not provide alone.

20 From SE 451 530 a safety bow is known for a children's seat to be mounted onto a conventional chair by straps. The safety bow has two horizontal ends for connecting onto corresponding horizontal top surfaces on side pieces or the seat. The side pieces are hollow with holes in the top surface for entering screws from the underside and into receiving holes on the underside of the bows ends. The bow also comprises a centre piece
25 with a peg in the bottom end for fitting into a hole in the children's seat.

Further, from EP 1 388 811 a limiting ring is known for a children's seat to be mounted onto a conventional chair. The limiting ring has two horizontal ends, for being associated with the back of the seat, and a separate supporting centre rod, with a lower threaded end for screwing into a threaded hole in the children' seat and a top end to be attached to the
30 limiting ring by a cap.

In later years, a development has evolved in the direction of more countries and regions having their own safety measures for equipment to be used by children, such as in children's chairs. This must be taken into account in the development of new children's chairs, but it may be difficult to adapt chairs which have been produced in a long period
5 before such safety provisions were put into force. It is especially difficult to perform such adoptions on chairs that have already been sold for many years, without making physical interventions in the chairs. There are thousands of chairs around in homes.

This is for example the case with the Tripp Trapp® children's chair which was developed as early as in 1972 and patented in 1976 and which still is a very popular children's chair
10 in many countries.

The chair is designed to be adjusted in coherence with the body size of the child and therefore has a seat plate and a foot plate which may be moved to different height positions in that they glide in tracks in the side pieces and are locked by tightening the distance between the side pieces. The sitting plate may further be adjusted in the depth
15 position in that a plate is pushed in relation to the seat back, and thereby providing the child using the chair a correct seat length under the thighs.

It has proven difficult to adapt existing seats to new effective demands, especially in order to keep the above mentioned original functions of the chair. In order to achieve this, the attachment of a safety bow for example should be able to follow the height and depth
20 position of the seat.

In addition to fastening a safety bow to such chairs, it may also be mentioned that it could be desirable to mount a children's harness which may be used simultaneously with the safety bow.

It is a further objective to provide a fastening means for such additional equipment as
25 mentioned above so that the owners of older chairs also may upgrade their chairs. It is also an objective to avoid physical interventions, such as making holes in any of the parts or inserting screws that leave spoiling marks in the chair which will be visible when there no longer is any use for the children's harness or the safety bow. Such interventions may further result in the risk of the user making adaptations in the wrong manner, so that the
30 safety is not kept intact. It is therefore an objective with the invention to make the fastening of the additional equipment as intuitive and simple as possible, upholding safety at the same time, preferably without the use of tools.

A safety bow should further be simple in design and reasonable to produce, taken into account that the safety bow is only used for a limited period of time, compared to the life of the chair.

Description of the invention

- 5 In order to attain these objectives the applicant has developed a safety bow which solves the problems mentioned above.

The present invention therefore concerns a safety bow for use in a children's chair with a seat plate, a backrest and possibly side pieces wherein the backrest or the side pieces have at least one opening each, preferably a horizontal opening, and wherein the safety bow is
10 characterized according to claim 1.

The invention will in the following be described in greater detail by the help of embodiments and the attached drawings, none of which are meant to limit the scope of the invention which is only defined by the appended claims.

Short Description of the Drawings

- 15 Figure 1 shows a perspective view of the safety bow according to the present invention.

Figure 2 shows a side view of the safety bow in figure 1.

Figure 3 shows an installation drawing of the safety bow during fastening to a children's chair.

Figure 4 shows the safety bow in figure 3 installed in a children's chair.

- 20 Figure 5 shows a side view of a second safety bow according to the invention installed in two different horizontal and vertical positions in a children's chair.

Figure 6 shows an alternative installation of the safety bow in figure 6.

Figure 7 shows a perspective view of the safety bow in figure 6.

Figure 8 shows a detail of the safety bow in figure 6.

Detailed Description

As may be seen from figure 1, the safety bow 40 is a three armed bow in one piece, comprising an arced crosspiece 41, and a vertical crotch piece 42.

5 The arched cross piece 41 has two ends 43 with first and second fixing means 44 for the fastening to a back of a chair or the side pieces in a chair. Similarly, the end of the crotch piece 42 has a third fixing means 46, in this embodiment a snap organ, for fixing to a seat plate of a bracket.

As may be seen from figure 2, the crosspiece 41 comprises a vertical wrap around band 47 in this embodiment with an upper overhanging flange 48 making up an essentially
10 horizontal surface. The transition between the band 47 and the flange 48 is curved due to comfort consideration for the child and provides a good support for the child's underarms. The construction also provides the crosspiece with added rigidity and strength, as well as torsion stability.

On account of safety regulations in some countries it may also be of interest that the band
15 47 in the crosspiece has a varying width so that it may be deeper in some places where it is desirable to limit the mobility of the child or to reduce the size or shape of the opening defined by the seat plate 2 and the bow 40, as shown in figure 3. In this embodiment the band 47 has an increased downward directed width in the side portions with flaps 49 on each side in the area between the ends 43 and the crotch strap 42.

20 In figure 3 it is further shown how the safety bow is mounted in a children's chair. As may be seen from figure 2, the connecting members comprise upward pointing shoes 44 bent backwards in relation to the cut off of the ends 43, and in figure 3 it is shown how these shoes 44 are hooked in between the upper crosspiece 3 and the lower crosspiece 4 of the backrest in the chair 1. The bow 40 is then rotated down in front so that the shoes 44 are
25 pressed forward in the top edge until the connecting member 46 in the end of the crotch piece 42 may be connected to a corresponding connecting member in the seat plate 2. In this embodiment, the connecting member in the seat plate 2 is an edge groove 12 in a fixing bracket 10, fixed to the seat plate 2 as shown in figure 3 and 4. The crotch piece 42 being somewhat flexible allows for a depth adjustment of the seat plate according to the
30 size of the child. Depending on the rigidity of the arched cross piece 41, and/or the arrangement of the first and second fixing means 44, the safety bow may also be adapted to different height positions, such as 2-3 positions, of the seat plate by being tilted upward or downward.

As the crotch piece 42 must absorb the loads exercised on the crossbow 41, it may be preferable that the safety bow 40 further comprises fitting surfaces against the children's chair 1 absorbing such loads. Dependent on the quality and flexibility of the safety bow 40, it may for example be preferable that the ends 43 of the cross piece 41 further
 5 comprise stopping members 45 in the form of downward directed stopping shoes bent forward in relation to the ends 43 as shown in figure 2. The stopping members 45 will thereby be pressed backward in the top edge on the upper front edge of the bottom crosspiece 4 of the backrest of the chair 1, as shown in figure 3. In this manner the safety bow 40 is strained completely firm when locked in seat 2 and is in addition hindered in
 10 horizontal backward directed movement at the same time as slack between the chair and safety bow is avoided. Simultaneously, a part of the load on the safety bow is absorbed.

In both the preceding and next embodiment the chair 1 has a backrest, consisting of two horizontal parallel crosspieces 3 and 4 forming a passing opening with a defined height. However, the opening may just as well consist of two separate openings in the backrest or
 15 in the side pieces of the chair, such as for example two parallel grooves with a defined height and possibly a defined width. The openings neither need be passing, but may be recesses with for example an edge or a track making locking possible by the hooking of connecting members 44 as shown. The ends 43 of the safety bow may possibly by themselves abut the back of the chair or the side pieces in order to lock the safety bow and
 20 hinder backward movement.

In figure 5 an alternative embodiment of the present invention is shown wherein the ends 43 of the crosspiece 41 comprise another form of connecting members 50 towards the opening(s) between the crosspieces 3 and 4 of the chair 1. In this embodiment the connecting members 50 comprise protruding extensions of the ends 43 (from the earlier
 25 figures) in the backward direction which may pass through opening(s) in the backrest 3, 4. The end of the connecting member 50 is completed with an important upward directed raised part so that the safety bow must be hooked into the opening(s) as described earlier. However, the connecting members 50 are dimensioned with more material in order to absorb higher loads than the organs 44. Thereby, there is no need for further stopping
 30 organs 45 in the front of the ends 43.

In addition to the raised part 51 the connecting member 50 may also further comprise an additional cross track 52 in the upper edge, as better shown in figure 7, and which allows hooking the crosspiece in one additional horizontal depth position closer to the backrest as shown in figure 5. Such a position would be of interest for the smallest children using the
 35 chair. In connection with increasing the horizontal opening limited by the arched

crosspiece 41 of the safety bow and the backrest, it will be of interest to lower the seat plate 2 as the child grows by changing from the cross track 52 to the raised part 51. In order to use the relative rigid bow 40 at alternate height positions of the seat plate 2, the connecting member 46 comprises several locking positions. The connecting member 46
5 comprises several snap locks after one another as shown in detail in figure 8.

As shown in figure 7, the end of the crotch strap 42 comprises a lower upward directed snap flap 51 such as in the precedent embodiment, but another downward directed snap flap 52 is positioned over this snap flap to hinder the crotch strap 42 in moving downward by itself, instead of a stopping edge as shown in the figures 1-4. By release of the second
10 snap flap 52, the crotch strap 42 may however be moved further down into the groove 12 and a third upward directed snap flap 53 will lock the crotch strap in a deeper position in the groove 12 and thereby be hindered in moving further down by the help of a fourth snap flap 54.

The crotch strap 42 may further have an additional numbers of snap flaps in order to
15 increase the possibility for adjustment, but the number is limited somewhat to avoid that the length piece protruding out under the seat plate when the safety bow is used in the inner position is in the way.

In figure 6 an alternative mounting in a children's chair is shown wherein the safety bow 40 is used with direct fixing of the crotch strap 42 by the connecting member 46 in a
20 groove in the seat plate 2 itself. In the original Tripp Trapp® chair there is for example such a groove for fixing of another type of crotch strap. The seat plate 2 may be displaced in the horizontal direction in order to adapt the depth to both the safety bow and the child. In general the fixing of the crotch strap 42 via a bracket 10, as shown in figure 5, will provide more space for movement of the child's legs as the crotch strap is fixed on the
25 outside of the seat plate, while the crotch strap is fastened on the outside of the seat plate, while the space in the embodiment according to figure 6 is somewhat more limited.

The safety bow may be produced in any suitable material, such as metal, wood, plastic or another synthetic material or a composite material. Preferably the safety bow is made of a semi-rigid material which is unsupported, but has sufficient flexibility for adjustment of
30 the seat depth, preferably made in plastic.

The advantage with the safety bow according to the invention is thus that it may be used on an existing chair, such as Tripp Trapp® chair or other chairs, without making physical changes on any of the parts of the chair, or demand the use of fastening means, such as screws. The safety bow is simply hooked in the back edge only by the help of the existing components and in the front edge by either the existing groove or a bracket on the seat plate. The safety bow may follow the adjustments of the chair both vertically and horizontally to a certain extent, such as by height adjustment and/or depth adjustment of the seat plate, without hindering any of the functions of the chair. The safety bow may easily be removed after use or be moved to another corresponding chair when it is no longer needed. The possibilities for adjustments which the safety bow includes cover the areas of adjustments of the seat plate which are of interest for use for babies and small children.

Another advantage with the safety bow according to the invention is that all necessary fastening members for fixing in a children's chair may be integrated in the safety bow, as shown in figure 6, without the need for extra loose parts or the use of tools.

Claims

1. A safety bow (40) for use in children's chair (1) comprising a seat plate (2), with a hole, a backrest (3, 4) and possibly two side pieces (5), wherein the backrest or side
 5 pieces have at least one opening each of a defined height,
 the safety bow being a three armed constructional part in one piece, wherein two first ends (43) comprise first and second connecting members (44) and a third end comprises a third connecting member (46) for detachable fixing to the seat plate (2),

characterized in that:

- 10 — the safety bow comprises a horizontally arched crosspiece (41) with the two first ends (43) and connecting members (44),
 — the first and second connecting members (44) are hooked shoes adapted for hooking into the openings in the backrest (3, 4) or the side pieces (5), and
 — the two first ends (43) comprise stopping members (45) hindering backward
 15 movement of the ends (43) through the openings in the backrest or the side pieces.

2. A safety bow according to claim 1, wherein the third connecting member (46) is arranged for detachable fastening to the hole or detachable fastening via a bracket to the
 20 hole in the plate, preferably by snapping.

3. A safety bow according to claim 1 or 2, wherein the safety bow is depth and/or height adjustable in relation to the backrest and the possible two side pieces, in adaption to a depth and/or height adjustable seat plate (2).

4. A safety bow according to any preceding claim, wherein said first and second
 25 connecting members (44) are adapted to hook into an opening in the backrest (3, 4) between a parallel spaced upper crosspiece (3) and lower crosspiece (4).

5. A safety bow according to any preceding claim, wherein the safety bow comprises an essentially vertical crotch piece (42), preferably with a smooth transition between the horizontal arched crosspiece (4).

- 30 6. A safety bow according to claim 5, wherein the crosspiece (41) comprises a mainly vertical wraparound band (47) with an upper essentially horizontal overhanging flange

(48), preferably with a rounded transition there between, more preferably the flange (48) provides a good support for the underarms of a child using the safety bow (40).

7. A safety bow according to any preceding claim, wherein the connecting members (44) in the two first ends (43) of the crosspiece (41) in the form of upward directed hooked
5 shoes.

8. A safety bow according to any preceding claim, wherein the safety bow (40) is depth adjustable in relation to the backrest.

9. A safety bow according to claim 8, wherein each of the two first ends (43) of the cross piece (41) further comprise at least one hooking groove (51), preferably on the topside of
10 the crosspiece (41), for depth adjustment of the safety bow (40) through the opening(s) in the backrest or side pieces.

10. A safety bow according to any of the claims 1-8, wherein the stopping members (45) of the two first ends (43) of the cross piece (41) are in the form of downward directed stopping shoes.

15 11. A safety bow according to any preceding claim, wherein the third connecting member (46) is in the form of an upward directed snap flap (51), preferably with an overlying stop surface.

12. A safety bow according to any preceding claim, wherein the crotch piece (42) is height adjustable, preferably in several intervals.

20 13. A safety bow according to claim 12, wherein the crotch piece (42) comprises at least one additional downward directed snap flap (52), possibly one or more additional upward directed snap flap(s) (53) and possibly a stopping surface (54).

14. A safety bow according to any preceding claim, wherein the crotch piece (42) is semi-rigid, preferably with bearing strength.

25 15. A safety bow according to any preceding claim, wherein the vertical wraparound band (47) of the crosspiece (41) further comprises downward extensions, preferably in the form of flaps (49) in the side portions in order to limit the opening between the safety bow (40) and the seat plate (2).

16. A safety bow according to any preceding claim, wherein the flaps of the cross piece (49) are adjustable and/or detachable.

17. The use of a safety bow according to any of the claims 1 to 16, in a children's chair, such as a chair with a seat plate and a foot plate which may be moved to different height
s and depth positions by being moved in and out of tracks in the side pieces of the chair.

18. The use according to claim 17 together with a children's harness.