

BELT FASTENING MECHANISM, SAFETY DEVICE EMPLOYING BELT
FASTENING MECHANISM AND SHOPPING TROLLEY WITH RECLINING SEAT

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BACKGROUND OF THE INVENTION

5 The present invention relates to a safety device which can be incorporated into, for example, the seat of a shopping trolley, a belt fastening mechanism applicable to the safety device, and a shopping trolley with a reclining seat.

Description of the Related Art

10 Supermarkets, large stores or the like is provided with shopping trolleys (referred to also as "shopping carts") to facilitate carrying shopping baskets containing many purchases. Some shopping trolleys are equipped with a baby seat for supporting a baby thereon. Fig. 15 shows one of such shopping
15 trolleys.

 As shown in Fig. 15, a shopping trolley 1 has a cart 3 having a frame 5 of a shape substantially resembling the letter V in a plan view. A narrow portion of the substantially V-shaped frame 5 is a front portion. Casters 7 are attached to the lower side
20 of the frame 5 at four position in front right, front left, rear right and rear left portions of the frame 5, respectively.

 Support bars 9 are extended upward from rear right and rear left portions of the frame 5, respectively. A seat 11 is attached to the support bars 9. The seat 11 is surrounded by an outer frame
25 13 having an upper portion formed in a handle 15. A basket support member 17 for supporting a shopping basket is welded to rear portions of the frame 5 of the cart 3. A rack 19 for supporting large corrugated cardboard boxes, packages of toilet papers and the like is built in a front portion of the frame 5.

30 The seat 11 has a seat board 21 and a backrest 23 formed integrally with the seat board 21. The seat 11 is fixed to the outer frame 13. A horizontal, round safety guardrail 25 is attached to the outer frame 13 so as to surround a space extending over the seat board 21. A safety belt 27 is placed on the inside
35 of the safety guardrail 25. The safety belt 27 is provided with a fastening means, such as a buckle 29.

 Generally, the safety belt 27 of the seat 11 mounted on

the conventional shopping trolley 1 exerts a low fastening force on a baby seated on the seat 11. It is possible that the baby is strained if the safety belt is fastened tight. The safety belt 27 must be unfastened and fastened again to adjust the length of the safety belt 27, which is inconvenient.

The safety guardrail 25 of the shopping trolley 1 is a large, fixed, round member expanding toward the front. Therefore, when nesting the shopping trolleys 1 for compact storage, the safety guardrails 25 of the adjacent shopping trolleys 1 touch each other and the shopping trolleys 1 are nested in a long length.

The safety guardrail 25 which is fixed and cannot be opened obstructs actions for loading a baby on and unloading the same from the shopping trolley.

SUMMARY OF THE INVENTION

The present invention has been made to solve those problems and it is therefore an object of the present invention to provide a safety device capable of exerting a large fastening force on a baby without straining the baby, of facilitating the adjustment of the fastening force thereof, of being collapsed to reduce the longitudinal size and of hardly obstructing actions for loading a baby on and unloading the same from the shopping trolley.

Another object of the present invention is to provide a belt fastening mechanism capable of being incorporated into the foregoing safety device and of facilitating the length of a belt.

A third object of the present invention is to provide a shopping trolley with a reclining seat with an adjustable backrest.

According to a first aspect of the present invention, a belt fastening mechanism comprises a gate structure having walls defining a tapered slit of a substantially V-shaped cross section through which a pair of belts to be fastened are passed, a frictional belt fastening bar disposed in the tapered slit of the gate structure to press the pair of belts against the walls of the gate structure defining the tapered slit, and a frictional belt fastening bar operating mechanism that moves the frictional belt fastening bar toward the narrower end of the tapered slit

to fasten the pair of belts and moves the frictional belt fastening bar away from the narrower end of the tapered slit to release the pair of belts.

In the belt fastening mechanism, it is preferable that the frictional belt fastening bar operating mechanism has a belt fastening lever holding the frictional belt fastening bar and capable of being turned on a pivot shaft.

In the belt fastening mechanism, it is preferable that the frictional belt fastening bar operating mechanism has further a belt fastening spring combined with the belt fastening lever to bias the frictional belt fastening bar toward the narrower end of the tapered slit of the gate structure.

In the belt fastening mechanism, it is preferable that the frictional belt fastening bar operating mechanism includes a belt releasing mechanism for forcibly moving the frictional belt fastening bar away from the narrower end of the tapered slit of the gate structure.

According to a second aspect of the present invention, a safety device comprises a seat, a substantially T-shaped safety guard capable of supporting a person seated on the seat by the crotch and the abdomen of the person and of turning back and forth on its lower end relative to the seat, a pair of belts each having one end fixed to the seat and the other end extending through the safety guard, and a belt fastening mechanism incorporated into the safety guard, wherein the belt fastening mechanism comprises a gate structure having walls defining a tapered slit of a substantially V-shaped cross section through which a pair of belts to be fastened are passed, a frictional belt fastening bar disposed in the tapered slit of the gate structure to press the pair of belts against the walls of the gate structure defining the tapered slit, and a frictional belt fastening bar operating mechanism that moves the frictional belt fastening bar toward the narrower end of the tapered slit to fasten the pair of belts and moves the frictional belt fastening bar away from the narrower end of the tapered slit to release the pair of belts.

In the safety device, it is preferable that each of the pair of belts has an end portion lined with an elastic liner in

the vicinity of the end portion of the belt fixed to the seat so as to stretch outward.

In the safety device, it is preferable that the seat is provided with guardrails integral to the seat on its right and
5 left sides.

According to a third aspect of the present invention, a shopping trolley with a reclining seat comprises a frame, a pair of support bars extending upward from the frame, a reclining seat pivotally supported on the pair of support bars, and a seat locking
10 mechanism capable of locking the reclining seat at least in a raised position and a reclined position.

In the shopping trolley with a reclining seat, it is preferable that the seat locking mechanism has a locking mode shifting means for shifting a locking mode from the reclined
15 position to the raised position when a forward force is applied to the reclining seat.

In the shopping trolley with a reclining seat, it is preferable that the seat locking mechanism comprises a slotted member put on the reclining seat and provided with slots, a
20 reclining rod having a lower end pivotally supported on the support bars and an upper end fitted in the slot of the slotted member so as to move along the slot, and a seat locking member provided on the slots of the slotted member and biased toward the slot so as to be engaged with the upper end of the reclining
25 rod.

In the shopping trolley with a reclining seat, it is preferable that the seat locking mechanism has a lever mechanism for forcibly moving the seat locking member out of the slot.

In the shopping trolley with a reclining seat, it is preferable that the seat locking member of the seat locking
30 mechanism has a projection engaged with the upper surface of the reclining rod, and an inclined part that moves the seat locking member out of the slot when the reclining rod comes from above into contact with the inclined part.

35 Preferably, the shopping trolley with a reclining seat further comprises a handle interconnecting the upper ends of the pair of support bars, a basket support disposed in a rear portion

of the frame to support a shopping basket, and a basket support lifting member capable of lifting up the basket support when a front end of a frame of another shopping trolley strikes thereon from behind.

5 In the shopping trolley with a reclining seat, it is preferable that the handle has the shape of an out-curved circular arc.

 In the shopping trolley with a reclining seat, it is preferable that the frame is provided with four casters, and the
10 frame is capable of turning about a vertical turning axis passing the center of gravity of the shopping trolley with a reclining seat loaded with a baby seated on the reclining seat.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a perspective view of a shopping trolley in a preferred embodiment according to the present invention;

 Fig. 2 is a side elevation of the shopping trolley shown in Fig. 1;

 Fig. 3 is a front elevation of the shopping trolley shown
20 in Fig. 1;

 Fig. 4 is a plan view of the shopping trolley shown in Fig. 1;

 Fig. 5 is an enlarged side elevation of an essential portion of the shopping trolley shown in Fig. 2 of assistance in explaining
25 the operation of a reclining seat;

 Fig. 6 is an enlarged side elevation of a seat locking mechanism shown in Fig. 5;

 Fig. 7 is a view of assistance in explaining the operation of the seat locking mechanism shown in Fig. 6;

30 Fig. 8 is a view of assistance in explaining the operation of the seat locking mechanism shown in Fig. 6;

 Fig. 9 is a view of assistance in explaining the operation of the seat locking mechanism shown in Fig. 6;

 Fig. 10 is a side elevation, similar to Fig. 2, of
35 assistance in explaining a shopping trolley nesting operation;

 Fig. 11 is a view of assistance in explaining an operation of the reclining seat shown in Fig. 5 caused by the shopping

trolley nesting operation;

Fig. 12 is a horizontal sectional view of a safety device incorporated into a reclining seat shown in Fig. 1;

Fig. 13 is an enlarged view of a belt fastening mechanism shown in Fig. 12;

Fig. 14 is a view of assistance in explaining the operation of the belt fastening mechanism shown in Fig. 13; and

Fig. 15 is a perspective view of a conventional shopping trolley.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will be described with reference to Figs. 1 to 14.

As shown in Figs. 1 to 4, a shopping trolley 31 has a cart 33 having a frame 35. The frame 35 is formed in a shape substantially resembling the letter V and has a narrower front portion and a wider rear portion. Four casters 37 are attached to front right, front left, rear right and rear left portions of the frame 35.

Support bars 39 extend upward from middle portions of the right and the left portion of the V-shaped frame 35. A reclining seat 41 is supported on middle portions of the support bars 39. The upper ends of the support bars 39 are interconnected by a handle 43. The handle 43 has the shape of an out-curved circular arc protruding rearward, i.e., toward the user using the shopping trolley 31. An instruction panel 45 is attached to a middle portion of the handle 43. The user is able to read instructions written on the instruction panel 45. A small umbrella holding ring 44 is attached to the support bar 39.

Basket Support Member

A basket support member (basket support) 47 for supporting a shopping basket 46 is supported on a rear portion of the frame 35 of the cart 33. As shown in Fig. 2 in a side elevation, the basket support member 47 has a contact part (basket support lifting member) 49 formed by bending a rear portion of the basket support member 47 upward. When a front end of a frame 35 of the cart 33 included in another shopping trolley 31 strikes on the

contact part 49 from behind, an upward force is applied to the basket support member 47. The front end of the frame 35 is beveled in a slope 51 with an inclination corresponding to that of the contact part 49.

5 The basket support member 47 is held loose on the frame 35 by a moving mechanism so that the basket support member 47 can be lifted up, the frame 35 of another shopping trolley 35 is able to creep under the basket support member 47 and the shopping trolleys 31 can be nested when an upward force is applied
10 to the contact part 49 of the basket support member 47 by the other shopping trolley 31. The moving mechanism turns on the front end of the basket support member 47 and moves upward.

Reclining Seat

 The two support bars 39 have bent middle portions and upper
15 portions of the two support bars 39 are curved rearward. Seat support members 57 project forward from portions of the support bars 39 slightly below the bent middle portions. The seat 41 is supported pivotally on front end portions of the seat support members 57 by pivotal shafts 58. The seat 41 has a seat board
20 59 and a backrest 61 formed integrally with the seat board 49.

 Right and left guardrails 59a are formed integrally with the seat board 59. The seat 41 is not provided with any parts corresponding to the round safety guardrail 25 shown in Fig. 15. The shortrounded guardrails 59a protrude forward on the right
25 and the left side of the seat board 59. A baby is able to stabilize its position on the seat 41 and to feel at ease on the seat 41 by holding the guardrails 59.

 The seat 41 can be set and locked in one of three positions, i.e., a raised position in which the backrest 61 is inclined at
30 an inclination of 60° to a horizon, an intermediate position in which the backrest 61 is inclined at an inclination of 45° to a horizon, and a reclined position in which the backrest 61 is inclined at an inclination of 32°, by a seat locking mechanism R (Fig. 6).

35 Reclining rods 63 hold the seat 41 at one of the three positions. Each reclining rod 63 has a lower end pivotally joined to the rear end of the seat support member 57 projecting from

the support bar 39, and an upper end fitted in a slot 65 formed in the seat 41. The slots 65 are formed in side portions of the backrest 61 so as to extend in a substantially vertical direction. The upper ends of the reclining rods 63 are able to move along
5 the slots 65.

A seat locking member 67 is disposed behind the slot 65. The seat locking member 67 has two locking projections 69 and 71 and an inclined edge (inclined part) 99. The reclining rod 63 come into engagement from below with the locking projection
10 69 when the seat 41 is set in the raised position, and with the locking projection 71 when the seat 41 is set in the intermediate position. When the seat 41 is set in the reclined position, the seat locking member 67 engages with the upper end 73 of the slot 65. The backrest 61 of the seat 41 is inclined at inclinations
15 of 60°, 45° and 32° when the seat 41 is in the raised position, the intermediate position and the reclined position, respectively.

The seat locking member 67 can be moved toward and away from the slot 65. The seat locking member 67 is biased by a locking
20 spring 75 so that the locking projections 69 and 71 project toward the slot 65. Three reclining shafts 77 are formed integrally with the seat locking member 67. A slotted member 79 mounted on the seat 41 provided with the slot 65 is provided with three slots 81. The reclining shafts 77 are fitted in and slide along the
25 three slots 81, respectively, to maintain the seat locking member 67 in a correct position when the seat locking member 67 slides forward and rearward.

The seat locking member 67 is moved forcibly away from the slot 65 by a lever mechanism 83. A lever 87 is able to slide
30 vertically along a levering slot 83 formed in a slotted member 79 mounted on the backrest 61. A recess 87a for receiving a fingertip is formed in a lower portion of the lever 87. The lever 87 can be made to slide upward with a finger by applying a fingertip to the recess 87a. When the lever 87 slides, a lever shaft 89
35 slides along a slot 85. An interlocking plate 91 is connected to the lever shaft 89.

The interlocking plate 91 is provided with two openings

93 having a shape substantially resembling a right triangle. The two upper ones of the three reclining shafts 77 are engaged with the openings 93, respectively. The interlocking plate 91 is biased downward by a spring 95 connected to a lower end portion
 5 of the interlocking plate 91.

Tilting Operation

With the seat locking mechanism R in a state shown in Fig. 6, the user moves the lever 87 upward with a finger. Then, the interlocking plate 91 is moved upward (in the direction of the
 10 arrow C) against the resilience of the spring 95. Consequently, the reclining shafts 77 are urged rearward by the inclined edges 97, i.e., edges corresponding to the hypotenuses of the right triangles, of the triangular openings 93 of the interlocking plate 91, and the seat locking member 67 is moved rearward (in the
 15 direction of the arrow D). Thus, the two locking projections 69 and 71 are moved forcibly away from the slot 65 as shown in Fig. 7. Thus, the reclining rod 63 is released and become free to move in the directions of the arrows A and B indicated in Fig. 6. The seat 41 can freely be turned for tilting.

20 The seat 41 is turned to a position corresponding to a desired one of the raised position, the intermediate position and the reclined position, and the lever 87 is released. Consequently, the interlocking plate 91 is moved downward in a direction opposite to the direction of the arrow C, the seat
 25 locking member 67 is moved toward the slot 65, the locking projections 69 and 71 engage with the reclining rod 63 or the upper end 73 of the slot 65 comes into engagement with the reclining rod 63 as shown in Fig. 6, to lock the seat 41 in the desired position.

30 Referring to Fig. 8, when a force acting in the direction of the arrow E acts on the seat 41 with the seat 41 in the reclined position or the intermediate position, the slotted member 79 attempts to move upward, i.e., in the direction of the arrow C. Consequently, the reclining rod 63 attempts to move downward,
 35 i.e., in the direction of the arrow B relative to the slotted member 79 and comes into contact with the inclined edge 99 of the seat locking member 67 from above. Then, the seat locking

member 67 having the locking projections 69 and 71 moved rearward away from the slot 65, i.e., in the direction of the arrow D as shown in Fig. 9. Consequently, the reclining rod 63 is released and becomes free to move downward, i.e., in the direction of the
 5 arrow B, along the slot 65, and the seat 41 turns automatically forward, i.e., in the direction of the arrow E, to the position corresponding to the intermediate position or the raised position (Fig. 8). The inclined edge 99 and the locking spring 75 constitute a locking mode shifting means.

10 During the automatic shifting of the seat 41, the seat locking member 67 does not touch the edges of the openings 93 of the interlocking plate 91, and therefore the interlocking plate 91 and the lever 83 are not moved. Thus, the seat 41 can smoothly be moved, which further facilitate the nesting operation (Figs.
 15 10 and 11).

Shape of Reclining Seat Facilitating Nesting Operation

Referring to Figs. 10 and 11, when the shopping trolleys 31 are nested during the nesting operation, the front end of the seat 41 of the rear shopping wagon 31 is in contact with the seat
 20 41 and the reclining rod 63 of the front shopping trolley 31. The front end 101 of the seat board 59 of each seat 41 is rounded so as to enable the front end to come smoothly into contact with the seat 41 and the reclining rod 63 of the adjacent shopping trolley 31. The back surface 103 of the backrest 61 has the shape
 25 of a circular arc as shown in Figs. 5 and 11. Therefore, contact angle can be maintained substantially constant and the force necessary to raise the seat 41 can be maintained substantially constant from an initial state through a final stage during the contact operation. Thus, the seat 41 can smoothly shift its the
 30 position, which enables carrying out the nesting operation more smoothly.

Center of Gravity

As shown in Fig. 4 in a plan view, the center G of gravity of the shopping trolley 31 with a baby of an age in the range
 35 of zero to two seated on the seat 41 can approximately be specified. The center C of turning of the shopping trolley 31 on the floor about its own axis can geometrically be determined from the

positions of the four casters 37; that is, the four casters 37 are equidistant from the center C of turning. The respective positions of the seat 41 and the four casters 37 are determined so that a vertical line passing the center G of gravity passes
5 the center C of turning. When the respective positions of the seat 41 and the casters 37 are thus determined, the shopping trolley 31 can smoothly be turned.

Safety Device

The seat board 59 of the seat 41 is provided with a safety
10 device 111 for securely protecting the baby seated on the seat 41 (Figs. 1 to 5 and 10 to 14).

The safety device 111 includes a substantially T-shaped safety guard 113 for supporting the baby seated on the seat 41 by the crotch and abdomen of the baby. The safety guard 113 is
15 defined by curved surfaces bulging toward the front. A curved back surface of the safety guard 113 fits the baby's abdomen softly. The safety guard 113 has a lower end portion supported on a horizontal shaft 115 as shown in Fig. 12. The safety guard 113 is able to turn back and forth on the horizontal shaft 115. The
20 safety guard 113 is biased toward the front, i.e., in an opening direction, by a torsion coil spring 117 mounted on the shaft 115 as shown in Fig. 5 to facilitate securing a space for loading a baby on and unloading the same from the shopping trolley 31 and to avoid giving an oppressive feeling to the baby seated on
25 the seat 41.

Two belts 119 are used for opening and closing the safety guard 113. Rear ends of the two belts 119 are attached to right and left portions of the seat 41, respectively. Free front ends of the belts 119 are passed through slots 120 formed in the rear
30 wall of the substantially T-shaped safety guard 113. Front end portions of the belts 119 are fastened in place by a belt fastening mechanism 121 (Figs. 12 to 14) and are drawn out of the safety guard 113 through a front opening 123 formed in the front wall of the safety guard 113.

35 The belt fastening mechanism 121 has a gate structure 125 defining a substantially V-shaped, tapered slit 125a having a tapered horizontal cross section tapered toward the rear. The

belts 119 are passed from the narrower rear end of the tapered slit 125a through the tapered slit 125a and are drawn out of the safety guard 113 through the front opening 123. A knurled belt fastening bar 127, i.e., a frictional belt fastening bar, is placed in the tapered slit 125a of the gate structure 125 so as to be placed between the two belts 119 with its axis extended in parallel to the surfaces of the belts 119 and perpendicular to a direction along the length of the belts 119. The belt fastening bar 127 has a cylindrical shape and has a surface provided with a plurality of axial ridges to produce a high friction between the belt fastening bar 127 and the belts 119. A belt fastening lever 129 has one end supporting the belt fastening bar 127. The belt fastening lever 129 is supported pivotally on a shaft 131 and is able to turn on the shaft 131. The belt fastening lever 129 is biased by a belt fastening spring 133 so as to press the belt fastening bar 127 toward the narrower end of the tapered slit 125a defined by the walls of the gate structure 125 to press the belts 119 against the walls defining the tapered slit 125a.

When the belts 119 are pulled, the belt fastening bar 127 can slightly be moved up, as viewed in Fig. 13, against the resilience of the belt fastening spring 133 by a frictional force applied thereto by the belts 119. The belt fastening lever 129, the belt fastening spring 133 and the associated parts constitute a belt fastening bar operating mechanism that permits the belt fastening bar 127 to move slightly.

A belt releasing button 135 is connected to the other end of the belt fastening lever 129 with a pin 136. The belt releasing button 135 is able to move in opposite directions along a circular path when the belt fastening lever 129 is turned. The belt releasing button 135 and the associated parts constitute a belt releasing mechanism for forcibly moving the belt fastening bar 127 for a belt releasing operation.

The rear end portion attached to the seat 41 of each belt 119 is lined with an elastic liner 137 as shown in Fig. 12. The elastic liner 137 forms the rear end portion of the belt 119 so as to stretch outward, i.e., in the direction of the arrow D in

Fig. 12. The liner 137 may be formed of any suitable material, such as an ethylene-vinyl acetate copolymer, provided that the material is sufficiently elastic to stretch the belt 11 outward and does not give an excessively stiff touch to the baby when
5 the baby is fastened to the seat 41 with the belts 119.

Safety Guard Control Operation

In an ordinary state, the belt fastening bar 127 is biased by the force of the belt fastening spring 133 toward the narrower end of the substantially V-shaped, tapered slit 125a of the gate
10 structure 125 to press the belts 119 against the walls of the gate structure 125 defining the tapered slit 125a. If a forward force is applied to the safety guard 113 in an attempt to turn the safety guard 113 forward (upward as viewed in Figs. 12 to
14), the belts 119 move rearward, i.e., in the direction of the
15 arrow C relative to the safety guard 113 and attempt to move further rearward, i.e., in the directions of the arrows A, relative to the safety guard 113. Consequently, the belt fastening bar 127 is drawn into the substantially V-shaped tapered
slit 125a of the gate structure 125 in the direction of the arrow
20 C by a frictional force exerted on the belt fastening bar 127 by the belts 119, so that the belts 119 are pinched firmly and fastened in place between the belt fastening bar 127 and the walls of the gate structure 125 defining the tapered slit 125a.
Therefore, the safety guard 113 cannot be turned forward.

25 When the safety guard 113 is opened, the belt releasing button 135 is depressed to turn the belt fastening lever 129 clockwise as shown in Fig. 14. Consequently, the belt fastening bar 127 is moved forcibly toward the wider end of the tapered slit 125a, i.e., in the direction of the arrow B. Thus, the belts
30 119 are released and become free to move in the directions of the arrows B and C.

After the belts 119 have been released, the safety guard 113 can freely turned forward (upward as viewed in Figs. 12 to 14) and rear ward (downward as viewed in Figs. 12 to 14). The
35 safety guard 113 can easily be turned rearward when a pulling force, i.e., a force acting in the direction of the arrow B, is applied to the belts 119.

The safety guard 113 can be turned rearward without operating the belt releasing button 135. A pulling force is applied to the belts 119 to urge the belts 119 toward the wider end of the tapered slit 125a of the gate structure 125, i.e.,
5 in the direction of the arrow B. The belts 119 can easily be pulled by gripping a grip 139 connected to front end portions of the belt 119. Then, the belt fastening bar 127 is moved slightly toward the wider end of the tapered slit 125a by a frictional force applied thereto by the belts 119, and then the belts 119
10 are released. The belts 119 are pulled by one hand, the safety guard 113 is pushed by the other hand toward the baby seated on the seat 41, and then the grip 139 connected to the belts 119 is released. Consequently, the belt fastening bar 127 is shifted slightly toward the narrower end of the tapered slit 125a by the
15 resilience of the belt fastening spring 133 to fasten the belts 119.

Effects of the Embodiment

When a pulling force, i.e., a force acting in the direction of the arrow B in Fig. 12, is applied to the belts 119, the belt
20 fastening mechanism 121 enables the safety guard 113 to be turned rearward, i.e., in the direction of the arrow C in Fig. 12, by pressing the same, so that the positions of the belts 119 relative to the safety guard 113 can readily be adjusted; that is, the effective length of the belts 119 can readily be adjusted.

25 The belts 119 can be fastened in place with reliability by the agency of the fastening spring 133, and the belt releasing operation can be achieved with reliability by depressing the belt releasing button 135 of the belt releasing mechanism.

The substantially T-shaped safety guard 113 supports the
30 baby seated on the seat 41 satisfactorily by the crotch and the abdomen, and is able to bind the baby firmly to the seat 41 without giving an oppressive feeling to the baby seated on the seat 41 because the safety guard 113 has a contact surface in contact with the baby and wider than that of the safety belt 27 (Fig.
35 15) employed in the conventional shopping trolley.

Since the safety guard 113 can be turned back and force, the plurality of shopping trolleys 31 can be nested and stored

in a row of a short length by turning the safety guards 113 rearward to reduce the length of the shopping trolleys 31.

Since the safety guard 113 is biased forward at all times by the torsion coil spring 17, the safety guard 113 is turned
5 away from the backrest 61 of the seat 41 in a free state and does not obstruct actions for loading a baby on and unloading the same from the shopping trolley 31.

Since the liners 137 are provided on the belts 119 so as to stretch the belts 119 outward as shown in Fig. 12, the belts
10 119 do not twine around a baby nor obstruct actions for seating the baby on and taking up the same from the seat 41.

The seat 41 can be smoothly turned forward and rearward to set the seat 41 selectively in the raised position, the intermediate position or the reclined position, and the seat 41
15 can be locked in place by the seat locking mechanism R.

When nesting the plurality of shopping trolleys 31, the front end 101 of the seat 41 of the succeeding shopping trolley 31 strikes against the back surface 103 of the seat 41 of the preceding shopping trolley 31 to turn the seat 41 of the preceding
20 shopping trolley 31 automatically toward the position corresponding to the raised position. The seat 41 does not have to be raised by hand and therefore the shopping trolleys 31 can readily be nested in a compact arrangement.

When nesting the plurality of shopping trolleys 31, the
25 front end of the frame 35 of the cart 33 of the succeeding shopping trolley 31 comes into contact with the contact part 49 of the basket support member 47 for supporting a shopping basket thereon of the preceding shopping trolley 31, raises the basket support member 47 of the preceding shopping trolley 31, and creeps under
30 the basket support member 47 of the preceding shopping trolley 31. Therefore the shopping trolleys 31 can readily be nested in a compact arrangement. Accordingly, the basket support member 47 can be set on a level below that of the frame 35 to secure a large space sufficient for receiving a shopping bag behind
35 the seat 41 in the reclined position.

The handle 43 having the shape of a circular arc facilitates the application of a force to the handle 43 in a turning direction

in which the user intends to turn the shopping trolley 31.

Since the vertical line passing the center G of gravity of the shopping trolley 31 with the baby loaded thereon pass the center C of turning of the shopping trolley 31, the shopping
5 trolley 31 can lightly be turned.

Other Embodiments

A bar having a sectional shape capable of coming into contact with the belts 119 and of exerting sufficient frictional force on the belts 119 may be used instead of the belt fastening
10 bar 127 having the knurled surface.

Although the belt fastening bar operating mechanism of the foregoing embodiment for operating the belt fastening bar 127 for a fastening action and a releasing action comprises the belt fastening lever 129a and the belt fastening spring 133, a belt
15 fastening bar operating mechanism comprising a holding member capable of loosely holding the opposite axial ends of the belt fastening bar 127 may be used.

Other embodiments may employ a reclining seat comprising a seat board corresponding to the seat board 59, and a backrest
20 corresponding to the backrest 61, separate from the seat board and capable of turning relative to the seat board instead of the seat 41 capable of turning back and forth and having the seat board 59 and the backrest 61 formed integrally with the seat board 59.

Other embodiments may employ a cart having a actually
25 V-shaped frame having a pointed front end instead of the cart employed in the foregoing embodiment and having the "substantially" V-shaped frame actually having a trapezoidal shape having a straight front side and straight sides. The point
30 is that the frame must be tapered toward the front to enable nesting.

As apparent from the foregoing description, the belt fastening bar of the belt fastening mechanism of the present invention is moved slightly away from the narrower end of the
35 tapered slit of the gate structure by frictional force applied by the belts to the belt fastening bar and releases the belts when the belts are pulled tight, and the effective length of the

belts can readily be adjusted by turning the safety guard rearward.

If a force drawing the belts rearward into the gate structure is applied to the belts, the belt fastening bar is moved
5 slightly toward the narrower end of the tapered slit by a frictional force applied thereto by the belts to nip the belts between the belt fastening bar and the walls defining the tapered slit, so that the belts are fastened.

The reliability of the belt fastening operation of the belt
10 fastening mechanism of the present invention is enhanced by the action of the spring, and the reliability of the belt releasing operation is enhanced by the belt releasing mechanism.

In the safety device of the present invention, the safety guard provided with the belt fastening mechanism can be turned
15 rearward relative to the belts by pulling out the belts put together from the belt fastening mechanism.

The substantially T-shaped safety guard supports firmly a person seated on the seat by the crotch and the abdomen, and is able to bind the person firmly to the seat. The safety device
20 does not put pressure on the person seated on the seat because the safety guard has a contact surface in contact with the person and wider than that of the safety belt employed in the conventional shopping trolley.

Since the safety guard can be turned back and force, the
25 length of the shopping trolley can be reduced by turning the safety guard rearward while the shopping trolley is not in use.

Since the liners are provided on the belts so as to stretch outward, the belts do not obstruct actions for seating the baby on and taking up the same from the seat.

30 A baby is able to stabilize its position on the seat and to feel at ease on the seat by holding the guardrails.

In the shopping trolley with a reclining seat of the present invention, the reclining seat can be turned back and forth and can be locked in a desired one of the raised position and the
35 reclined position by the seat locking mechanism.

What is claimed is:

1. A belt fastening mechanism comprising:

a gate structure having walls defining a tapered slit of a substantially V-shaped cross section through which a pair of belts to be fastened are passed;

a frictional belt fastening bar disposed in the tapered slit of the gate structure to press the pair of belts against the walls of the gate structure defining the tapered slit; and

a frictional belt fastening bar operating mechanism that moves the frictional belt fastening bar toward the narrower end of the tapered slit to fasten the pair of belts and moves the frictional belt fastening bar away from the narrower end of the tapered slit to release the pair of belts.

2. The belt fastening mechanism according to claim 1, wherein

the frictional belt fastening bar operating mechanism has a belt fastening lever holding the frictional belt fastening bar and capable of being turned on a pivot shaft.

3. The belt fastening mechanism according to claim 2, wherein

the frictional belt fastening bar operating mechanism has further a belt fastening spring combined with the belt fastening lever to bias the frictional belt fastening bar toward the narrower end of the tapered slit of the gate structure.

4. The belt fastening mechanism according to claim 1, wherein

the frictional belt fastening bar operating mechanism includes a belt releasing mechanism for forcibly moving the frictional belt fastening bar away from the narrower end of the tapered slit of the gate structure.

5. A safety device comprising:

a seat;

a substantially T-shaped safety guard capable of supporting a person seated on the seat by the crotch and the abdomen of the person and of turning back and forth on its lower end relative to the seat;

a pair of belts each having one end fixed to the seat and



the other end extending through the safety guard; and
 a belt fastening mechanism incorporated into the safety guard;

wherein the belt fastening mechanism comprises:

a gate structure having walls defining a tapered slit of a substantially V-shaped cross section through which a pair of belts to be fastened are passed;

a frictional belt fastening bar disposed in the tapered slit of the gate structure to press the pair of belts against the walls of the gate structure defining the tapered slit; and

a frictional belt fastening bar operating mechanism that moves the frictional belt fastening bar toward the narrower end of the tapered slit to fasten the pair of belts and moves the frictional belt fastening bar away from the narrower end of the tapered slit to release the pair of belts.

6. The safety device according to claim 5, wherein each of the pair of belts has an end portion lined with an elastic liner in the vicinity of the end portion of the belt fixed to the seat so as to stretch outward.

7. The safety device according to claim 5, wherein the seat is provided with guardrails integral to the seat on its right and left sides.

8. A shopping trolley with a reclining seat comprising:
 a frame;
 a pair of support bars extending upward from the frame;
 a reclining seat pivotally supported on the pair of support bars; and

a seat locking mechanism capable of locking the reclining seat at least in a raised position and a reclined position.

9. The shopping trolley with a reclining seat according to claim 8, wherein

the seat locking mechanism has a locking mode shifting means for shifting a locking mode from the reclined position to the raised position when a forward force is applied to the reclining seat.

10. The shopping trolley with a reclining seat according to claim 8, wherein



the seat locking mechanism comprises:

a slotted member put on the reclining seat and provided with slots;

a reclining rod having a lower end pivotally supported on the support bars and an upper end fitted in the slot of the slotted member so as to move along the slot; and

a seat locking member provided on the slots of the slotted member and biased toward the slot so as to be engaged with the upper end of the reclining rod.

11. The shopping trolley with a reclining seat according to claim 10, wherein

the seat locking mechanism has a lever mechanism for forcibly moving the seat locking member out of the slot.

12. The shopping trolley with a reclining seat according to claim 10, wherein the seat locking member of the seat locking mechanism has a projection engaged with the upper surface of the reclining rod, and an inclined part that moves the seat locking member out of the slot when the reclining rod comes from above into contact with the inclined part.

13. The shopping trolley with a reclining seat according to claim 8 further comprising:

a handle interconnecting upper ends of the pair of support bars;

a basket support disposed in a rear portion of the frame to support a shopping basket; and

a basket support lifting member capable of lifting up the basket support when a front end of a frame of another shopping trolley strikes thereon from behind.

14. The shopping trolley with a reclining seat according to claim 8, wherein

the handle has the shape of an out-curved circular arc.

15. The shopping trolley with a reclining seat according to claim 8,

wherein the frame is provided with four casters, and the frame is capable of turning about a vertical turning axis passing the center of gravity of the shopping trolley with a reclining seat loaded with a baby seated on the reclining seat.



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