

STROLLER

BACKGROUND OF THE INVENTIONField of the Invention

5 The present invention relates to a stroller which is foldable when it is not being used.

Background Art

10 Commonly, for a stroller adapted to use for taking a baby out of doors for a walk or shopping, various strollers have been proposed, which can be folded as needed to facilitate storing or carrying them.

Fig. 11 is a schematic perspective view in an unfolded state of a conventional foldable stroller. As shown in Fig. 11, the stroller is composed of a pair of left and right front legs 2 each having a front wheel 1, a pair of left and right rear legs 4 each having a rear wheel 3, a push rod 5 which is bent in a generally U-like shape, a pair of left and right arm rests 6, a front connecting member 7 which can also be used as a footrest plate, and the like. Rear ends of the arm rests 6 are pivotally mounted to left and right side portions of the push rod 5, respectively. The front legs 2 are pivotally mounted to the front portions of the arm rests 6, respectively. The left and right rear legs 4 are pivotally connected to the arm rests 6 at their upper ends, respectively. These left and right rear legs 4 are coupled to each other via a rear connecting member 8. Further, a lower end of an L-shaped bracket 9 is pivotally mounted to each rear leg 4, and an intermediate portion of each bracket 9 is pivotally mounted to a lower end of each push rod 5. In addition, a locking piece 10 is fit around a lower end of each push rod 5 such that the locking piece 10 can slide reciprocally along the push rod 5, wherein the locking piece 10 can be engaged with an upper end of each L-shaped bracket 9.

35 In this way, as shown in Fig. 11, a body of the stroller can be held in a usable unfolded state by engaging the locking piece 10 provided at a distal portion of each push rod 5 with each corresponding bracket 9. Operation of a handling lever 12

of a remote handling equipment 11 provided at a handle portion of the push rod 5 can disengage the locking piece 10 from the bracket 9. Thus, the arm rests 6, front legs 2 and rear legs 4 become swayable, so that they can take a folded form where the front legs 2 and rear legs 4 are arranged in parallel, or otherwise can be folded in a U-shaped threefold form.

Document 1 cited: Japanese Utility Model Laid-Open No. 6-37050

However, for the stroller as described above, due to the operation for unfolding or folding, the remote handling equipment 11 which includes a large number of components and has a complicated construction must be provided at the push rod 5. Therefore, such a stroller is not suitable to achieve further miniaturization, slimming or weight reduction of the structure in response to the need for convenience in carrying it. In addition, in order to fold the stroller from its unfolded state, the folding operation of its body must be conducted by operating the handling lever 12 of the remote handling equipment 11 as mentioned above to disengage each locking piece 10 from each bracket 9. Therefore, at least one hand can not be used due to such operation of the remote handling equipment 11, thus in some cases, the handling ability for the folding may be compromised. For a stroller intended to achieve miniaturization, slimming or weight reduction of the structure in response to the need for convenience in carrying the stroller, and in particular for a stroller employing a pair of left and right L-shaped push rods, rather than using the U-shaped push rod, it is not possible to provide the remote handling equipment to such push rods, thus making the handling ability problematic.

SUMMARY OF THE INVENTION

In light of the above, an object of the present invention is to provide a stroller having a hood, which can eliminate the need to employ a complicated remote handling equipment, facilitate the operation of folding or unfolding, have a self-supporting mechanism, and achieve miniaturization and

weight reduction.

The present invention is a foldable stroller, comprising: a pair of front legs, each having a front wheel at its lower end; a pair of rear legs, each having a rear wheel at its lower end; a pair of push rods, each being connected to the corresponding rear leg; L-shaped brackets, each being pivotably connected to the corresponding rear leg at its lower end and being pivotably connected to a lower end of the corresponding push rod at its intermediate portion; and locking sleeves, each being slidably attached to a lower end of the corresponding push rod, and having a locking piece; wherein a first recess is formed on a surface of each bracket facing the corresponding push rod such that the first recess can be engaged with the locking piece of the corresponding locking sleeve when the stroller is unfolded, and wherein an elastic piece is provided adjacent to the first recess of each bracket such that the elastic piece can be engaged with the corresponding locking piece when the locking piece is disengaged from the first recess, while holding the locking piece to be disengaged from the first recess.

The present invention is the stroller, further comprising cam portions, each being provided on the surface of each bracket facing the corresponding push rod such that the cam portion can slide along the locking piece of each locking sleeve during rotation of the bracket.

The present invention is the stroller, wherein in at least one of the brackets, the first recess is provided on one side relative to the intermediate portion of the bracket, and a second recess adapted to be engaged with the locking piece of the corresponding locking sleeve when the stroller is folded, is provided on the other side relative to the intermediate portion.

The present invention is the stroller, wherein the pair of front legs and the pair of push rods are connected to each other through an X-shaped horizontal link.

The present invention is the stroller, wherein each elastic piece is provided at a distal end of the corresponding bracket on the side of the first recess, the elastic piece being adapted to be

engaged with the locking piece of the corresponding locking sleeve, which locking piece being disengaged from the first recess.

5 The present invention is a foldable stroller, comprising: a pair of front legs, each having a front wheel at its lower end; a pair of rear legs, each having a rear wheel at its lower end; and a pair of push rods, each being connected to each corresponding rear leg; wherein the pair of front legs and the pair of push rods are connected to each other through an X-shaped horizontal link including two links, and wherein a grounding rod is provided
10 such that it extends backward from one of the links constituting the horizontal link when the stroller is unfolded while it can be grounded together with the pair of rear wheels when the stroller is folded.

15 The present invention is the stroller, further comprising L-shaped brackets, each being pivotably connected to the corresponding rear leg at its lower end and being pivotably connected to the corresponding push rod at its intermediate portion; and locking sleeves, each being slidably attached to a lower end of the corresponding push rod and having a locking
20 piece adapted to be engaged with the corresponding bracket.

The present invention is the stroller, wherein a first recess is formed on a surface of each bracket facing the corresponding push rod such that the first recess can be
25 engaged with the locking piece of the corresponding locking sleeve when the stroller is unfolded.

The present invention is the stroller, wherein an elastic piece is provided adjacent to the first recess of each bracket such that the elastic piece can be engaged with the
30 corresponding locking piece when the locking piece is disengaged from the first recess, while holding the locking piece being disengaged from the first recess.

The present invention is a stroller, comprising: a stroller body; a hood attached to the stroller body; the hood comprising
35 hood frame attachment bosses detachably attached to the stroller body; an inverted U-shape first hood frame fixed to each

hood frame attachment boss; an inverted U-shape second hood frame attached to the hood frame attachment bosses such that it can swing relative to the first hood frame; and a hood cloth stretched between the first hood frame and the second hood frame; wherein a first locking groove, and a second locking groove defining a predetermined angle relative to the first locking groove are provided on a side face of each hood frame attachment boss; and wherein a locking piece adapted to be selectively engaged with the first locking groove or the second locking groove is provided to the second hood frame.

The present invention is the stroller, wherein the first and second hood frames comprise a wire material.

The present invention is the stroller, wherein a proximal portion of the second hood frame is wound around a shaft provided to each hood frame attachment boss, and wherein the locking piece adapted to be selectively engaged with the first locking groove or the second locking groove is provided at a distal portion of the wound second hood frame.

The present invention is the stroller, wherein the locking piece is provided at a distal portion of the second hood frame and including a bent ring-like portion.

Since the present invention is constructed as described above, when the stroller is folded from its unfolded state, by pulling up the left and right locking sleeves higher than the elastic pieces of the brackets, the locking pieces of the locking sleeves can be locked by upper portions of the elastic pieces of the brackets, thereby holding the locking pieces to be disengaged from the recesses of the brackets. Accordingly, by pushing the left and right push rods forward in this state, the stroller can be folded with ease. When the stroller is unfolded for use from its folded state, by pulling up the locking sleeve provided on the side of the bracket with the second recess formed therein to disengage the locking piece of this locking sleeve from the second recess, and by lifting up the push rods and drawing the handles of the push rods toward the user, the stroller can be readily unfolded. Accordingly, a remote

handling equipment with a large number of parts and a complicated construction becomes no longer required, thus achieving miniaturization, slimming or weight reduction of the structure.

5 Since the present invention is constructed as described above, the stroller can take an automatically grounded position simultaneously with the folding operation of the stroller body. In the grounded position, the grounding rod can be grounded together with the left and right rear wheels, thus enabling to
10 maintain the stroller standing alone with self support. Moreover, since the grounding rod only projects backward from one of the links constituting the X-shaped horizontal link in the unfolded state for using the stroller, a simple construction can be obtained, the number of components can be reduced, and
15 also, the stroller can be smoothly operated without being affected by any interference due to the grounding rod.

 Since the present invention is constructed as described above, bendable link members as used for conventional hoods are no longer required. The hood frames can be fixed in
20 position by utilizing locking grooves formed on a side face of each boss and locking pieces provided to each hood frame, thus reducing the number of components and achieving weight reduction. Further, since the conventional link members are no longer required and the hood frames can comprise a wire
25 material, a significantly simple construction of the locking pieces can be achieved, as such further weight reduction can be attained.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Fig. 1 is a perspective back view of a stroller of the present invention.

 Fig. 2 is a back view of the stroller of the present invention.

 Figs. 3(a), (b) are illustrations for showing the operation
35 of a rear connecting member.

 Fig. 4 is a perspective view showing a construction of a

connecting portion of a push rod and a rear leg of the present invention.

Fig. 5 is a diagram showing a relationship between the push rod and a bracket in an unfolded state of the stroller of the present invention.

Fig. 6 is a diagram showing a relationship between the push rod and a right side bracket in a folded state of the stroller of the present invention.

Fig. 7 is a diagram showing a relationship between the push rod and a left side bracket in a folded state of the stroller of the present invention.

Fig. 8 is a side view of the stroller in a folded state.

Fig. 9 is a back view of the stroller in a folded state.

Fig. 10 is a partly cut away view of a hood according to the present invention.

Fig. 11 is a perspective view of a conventional stroller.

DETAILED DESCRIPTION OF THE INVENTION

Now, embodiments of the present invention will be described with reference to the drawings.

Figs. 1 and 2 are a perspective back view and a back view, generally showing a stroller of the present invention, respectively. As shown in Figs. 1 and 2, a stroller 20 comprises a stroller body 20a and a hood 50 attached to the stroller body 20a. The stroller body 20a comprises a pair of front legs 22, 22, each having at its lower end a front wheel 21 composed of two wheels; a pair of rear legs 24, 24, each having at its lower end a rear wheel 23 composed of two wheels; a pair of inverted L-shaped push rods 25, each being in communication with each corresponding rear leg 24 and having a handle portion 25a which is provided at a top end and bent forwardly; and arm rests 26, each connecting the front leg 22 to the corresponding push rod 25.

To each of the pair of left and right push rods 25, a rear end of each corresponding arm rest 26, is pivotally mounted. To a front portion of each of the left and right arm rests 26 a

top end of each corresponding front leg 22 is pivotally mounted. A top end of each rear leg 24 is pivotally mounted to the corresponding arm rest 26 behind the pivot point of the front leg 22. To each rear leg 24, one end of an L-shaped bracket 27
 5 is pivotally mounted via a pin 28. Additionally, an intermediate portion of the bracket 27 is pivotally mounted via a shaft 29 to a portion near a distal end of the push rod 25. In a state of use, i.e., in an unfolded state, as shown in Fig. 1, of the stroller, a lower end of each push rod 25 is engaged with the
 10 corresponding rear leg 24 such that the position of the rear leg 24 can be fixed.

The left and right front legs 22 and both of the push rods 25 are connected together via an X-shaped link 30 (a horizontal link). The X-shaped link 30 is composed of two links 30a, 30b
 15 which are pivotally connected to each other at their approximately central portions and arranged in an X-like shape such that they can open and close as needed. A rear end of each link 30a, 30b is pivotally connected to a lower end of the corresponding push rod 25 via a joint 31 such that it can be
 20 pivoted about an axis orthogonal to the push rod 25 as well as about an axis orthogonal to the link 30a or 30b. Further, a front end of each link 30a, 30b is pivotally mounted to each corresponding one of the left and right front legs 22 via a joint 32 such that it can be pivoted about an axis orthogonal to the
 25 front leg 22 as well as about an axis orthogonal to the link 30a or 30b. To the link 30a as the one of elements constituting the X-shaped link 30 in an unfolded state, a grounding rod 33 is provided to project backward, such that the stroller 20 can stand along with self support by grounding a distal end of the
 30 rod 33 together with the left and right rear wheels 23 when the stroller 20 is folded.

To each of the left and right front legs 22, a front end of a connecting bar 34 which can also be used as a seat supporting member is pivotally mounted via a shaft 34a, while a rear end
 35 of the connecting bar 34 is pivotally connected to each of the left and right push rod 25 via a shaft 35. Further, the left and

right push rods 25 are connected to each other via an X-shaped link (a vertical link) 36. The X-shaped link 36 is also composed of two links 36a, 36b which are pivotally connected to each other at their approximately central portions and arranged in an X-like shape such that they can open and close as needed. A top end of each link 36a, 36b is pivotally connected to an upper portion of each corresponding push rod 25 via a joint 37 such that it can be pivoted about an axis orthogonal to the push rod 25 as well as about an axis orthogonal to the link 36a or 36b. A bottom end of each link 36a, 36b is pivotally connected to a lower end of each corresponding push rod 25 via a joint 38 such that it can be pivoted about an axis orthogonal to the push rod 25 as well as about an axis orthogonal to the link 36a or 36b.

The lower portions of the left and right front legs 22 are connected together via a footrest plate 39 formed of an elastic material, and the left and right rear legs 24 are connected together via a rear connecting member 40 which is bendable at its intermediate portion. The rear connecting member 40 is composed of two connecting rods 40a, 40b as shown in Figs. 3(a), 3(b), where the connecting rods 40a, 40b are pivotally connected together via a pin 41. Around the connecting rod 40a, a locking member 42 from which an operational piece 42a projects is slidably fitted. Namely, a long aperture 40a1 is formed in the connecting rod 40a, and a pin 42b projecting from the locking member 42 is engaged with the long aperture 40a1, such that the locking member 42 is biased toward the other connecting rod 40b by a spring 42c provided between the pin 42b and a spring bracket 43 provided on the connecting rod 40a. At a distal end of the connecting rod 40b, a notch 44 is formed with which the pin 42b of the locking member 42 will be engaged when both the connecting rods 40a, 40b are collinear. In this way, as shown in Fig. 3(a), when both the connecting rods 40a, 40b are collinear, the locking member 42 will move in the right direction in the drawing by the effect of the spring 42c and be fitted around both the connecting rods 40a, 40b, thus locking the two connecting rods 40a, 40b. On the contrary,

when the locking member 42 is moved in the left direction in the drawing against the spring 42c using the operational piece 42a, the aforementioned locking effect due to the locking member 42 is released, thereby causing both the connecting rods 40a, 40b to be bent as shown in Fig. 3(b).

Fig. 4 is an enlarged view showing a construction of a bracket 27 arranged on the right side. To one end opposite to the point 28 at which the bracket 27 is pivotally connected to the rear leg 24, an elastic piece 27a is provided which is bent toward the push rod 25.

A locking sleeve 45 on which an operational nail 45a is provided is slidably fitted around a lower end of the push rod 25 and biased downward by a spring not shown. A locking piece 45b (Fig. 5) projects from the locking sleeve 45 such that it can be engaged with an engagement recess (which will be described below) formed in the bracket 27. Thus, when the locking sleeve 45 is pulled up against the spring, a lower end of the locking piece 45b is locked by an upper end of the elastic piece 27a of the bracket 27.

Specifically, a cam portion 46 is integrally formed with the surface of each bracket 27 facing the push rod 25 as shown in Fig. 5. To the cam portion 46, a first recess 46a is formed, with which the locking piece 45b will be engaged when the stroller is in an unfolded state. To the cam portion 46 of either one of the left and right brackets 27, for example, the right side bracket 27 as is seen along the moving direction of the stroller, a second recess 46b is further provided, with which the locking piece 45b will be engaged when the stroller is folded.

In this case, the first recess 46a is provided on one side relative to the shaft 29 of the bracket 27, while the second recess 46b is provided on the other side relative to the shaft 29 of the bracket 27, where the elastic piece 27a of the bracket 27 is positioned adjacent and distal to the first recess 46a.

In the case where the stroller is folded from an unfolded state as shown in Figs. 1 and 2, when the left and right locking sleeves 45 are pulled up higher than the elastic pieces 27a of

the brackets 27, the locking pieces 45b of the locking sleeves 45 are locked by upper portions of the elastic pieces 27a of the brackets 27, respectively (see dashed lines of Fig. 4), so that the locking pieces 45b can be held while being disengaged from
 5 the first recesses 46a of the brackets 27, respectively.

Next, the locking member 42 of the rear connecting member 40 is moved in the direction for disengaging it from the connecting rod 40b, and the left and right push rods 25 are pushed forward while the respective connecting portions of the
 10 connecting rods 40a, 40b being pushed down using a leg or the like. At this time, each bracket 27 rotates about the pivot point 28 connecting it to the push rod 25 in a clockwise direction in Fig. 1, thus moving each push rod 25 downward relative to each rear leg 24. This movement of the push rods 25 make the arm
 15 rests 26 and the connecting bars 34 be swayed upward about the pivot points connecting them to the push rods 25, respectively. As a result, the front legs 22 and the rear legs 24 move in close to each other, thus reducing the size as measured from the front to back of the stroller. At the same time, the
 20 X-shaped links 30, 36 move in the closing direction correspondingly to the swaying movements of the arm rests 26 and connecting bars 34, bringing the left and right front legs 22, rear legs 24 and push rods 25 to move in close to one another, thus reducing the lateral size of the stroller. Also, the rear
 25 connecting member 40 is bent downward while the footrest plate 39 is bent upward, without interfering the approach of the legs and the like. Once in the folded state, as shown in Fig. 6, the locking piece 45b of the locking sleeve 45 will be engaged with the second recess 46b of the right side bracket 27 so that
 30 the folded state as described above can be maintained. In this case, since there is no second recess provided at the left side bracket 27, as shown in Fig. 7, the locking piece 45b of the left side locking sleeve 45 is only abutting a cam face of the cam portion 46. Fig. 8 is a side view of a stroller in a folded state,
 35 and Fig. 9 is a back view of the stroller. In the folded state, as shown in Fig. 9, the grounding rod 33 is extending downward.

Thus, a three-point supporting mechanism can be provided by the grounding rod 33 and the left and right rear wheels 23, whereby the stroller can stand alone with self support on a floor or the ground.

5 When the folded state is changed to the unfolded state for use, the right side locking sleeve 45 is pulled up to disengage the locking piece 45b of the locking sleeve 45 from the second recess 46b of the bracket 27, while the push rods 25 being lifted upward and the handles 25a of the push rods 25
10 being drawn toward the user. At this time, in an opposite manner to the description above, the front and rear legs 22, 24 move away from one another and the front wheels 21 and rear wheels 23 also separate from one another so as to take the unfolded state as shown in Fig. 1. In this case, the lower ends
15 of the push rods 25 abut the rear legs 24, and the locking pieces 45b of the locking sleeves 45 are engaged with the first recesses 46a of the brackets 27, respectively, thus fixing the positional relationship between the rear legs 24 and the push rods 25. Further, the connecting rods 40a and 40b are
20 collinearly locked by the locking member 42 of the rear connecting member 40, thereby maintaining the unfolded state of the stroller.

As shown in Fig. 1, the hood 50 adapted to be deployed and contracted is detachably secured to both the push rods 25
25 of the stroller body 20a. Fig. 10 is a perspective view of a boss portion for attachment of a right hood frame for the hood 50, in which a hood frame attachment boss 51 has a side face of a generally fan-like shape, and an attachment portion 51a for attachment to each push rod 25 projects from a front periphery
30 of the boss 51. To the attachment portion 51a is provided a recess (not shown) which is adapted to be engaged from above along the push rod 25 with a locking piece 52 provided to the push rod 25. In addition, to a side face of the attachment portion 51a is integrally arranged a hook 53 which can be
35 engaged with a projection 52a located at a lower end of the locking piece 52 provided to the push rod 25 in order to prevent

the attachment part 51a from slipping out of the stroller body 20a.

To a rear periphery of the hood frame attachment boss 51 is fixedly attached a proximal end of a first hood frame 54
5 formed of a wire which is bent into an inverted U-shape. To a base portion of the hood frame attachment boss 51, a proximal portion of a second hood frame 55 formed of a wire which is bent into an inverted U-shape is pivotally mounted, such that it can swing in a predetermined range. Namely, on the side face
10 of the boss 51, a first locking groove 56 extending radially along the first hood frame 54 as well as a second locking groove 57 extending radially and defining a predetermined angle relative to the first locking groove 56 are formed. A proximal portion of the second hood frame 55 is wound around a shaft 58 provided
15 to the boss 51. At a distal portion of the wound wire constituting the second hood frame 55, a ring-like locking piece 55a adapted to be selectively engaged with the first locking groove 56 or second locking groove 57 is provided. In this way, a hood cloth 59 is stretched between the first hood frame 54
20 and the second hood frame 55.

The attachment portion 51a of the hood frame attachment boss 51 for the hood 50 is engaged with the locking piece 52 provided to the push rod 25 so as to fixedly attach it to the push rod 25. Subsequently, the hood cloth 59 can be
25 folded by engaging the locking piece 55a of the second hood frame 55 with the first locking groove 56. Otherwise, the hood cloth 59 can be deployed by bringing the second hood frame 55 to swing forward and engaging its locking piece 55a with the second locking groove 57.

CLAIMS

1. A foldable stroller, comprising:
 - a pair of front legs, each having a front wheel at its lower end;
 - a pair of rear legs, each having a rear wheel at its lower end; and
 - a pair of push rods, each being connected to each corresponding rear leg;wherein the pair of front legs and the pair of push rods are connected to each other through an X-shaped horizontal link including two links, and wherein a grounding rod is provided such that it extends backward from one of the links constituting the horizontal link when the stroller is unfolded, while it can be grounded together with the pair of rear wheels when the stroller is folded.
2. The stroller according to claim 1, further comprising L-shaped brackets, each being pivotably connected to the corresponding rear leg at its lower end and being pivotably connected to the corresponding push rod at its intermediate portion; and locking sleeves, each being slidably attached to a lower end of the corresponding push rod and having a locking piece adapted to be engaged with the corresponding bracket.
3. The stroller according to claim 2, wherein
 - a first recess is formed on a surface of each bracket facing the corresponding push rod such that the first recess can be engaged with the locking piece of the corresponding locking sleeve when the stroller is unfolded.
4. The stroller according to claim 3, wherein
 - an elastic piece is provided adjacent to the first recess of each bracket such that the elastic piece can be engaged with the corresponding locking piece when the locking piece is disengaged from the first recess, while holding the locking piece being disengaged from the first recess.