

STROLLER

Filed of the Invention

The present invention relates to a stroller, more
5 specifically, it pertains to a stroller in which a hand push
rod is capable of being swung to the facing side of a baby
or the back side of a baby.

Related Art

Various strollers used for taking a baby out for a walk
10 or shopping have been proposed and used. The strollers are
folded as needed for easy keeping and carrying, and hand push
rods are to be positioned in a back state for pushing the
baby from the back, or the hand push rods are to be positioned
in a facing state for pushing the baby with facing a user.

15 However, front wheels of a stroller are generally
rotatable about the vertical axes for its good running
operation. Thus, as stated above, when a hand push rod is
swung from the back pushing state for pushing the stroller
from the back side, to the facing pushing state for pushing
20 the stroller from the front side, wheels of the rear side
in the advancing direction are rotatable about the vertical
axes. Then such problems may arise that it is difficult to
change the course of the stroller and to smoothly drive the
stroller. It may be considered that both the front wheels
25 and the rear wheels are rotatable about the vertical axes,
but, there may be a problem that it is difficult to smoothly
advance the stroller.

Summary of the Invention

30 In the light of the disadvantages as stated above, it
is an object of the present invention to provide a stroller
in which only wheels on the front side in the advancing
direction can rotate about the vertical axes, in both cases
where a hand push rod is in a back side pushing state or a
35 facing side pushing state.

A stroller according to the present invention
comprises a stroller body including a pair of front legs each

having a front wheel and a pair of rear legs each having a rear wheel, a hand push rod swingably provided to the stroller body, capable of being positioned at a facing side of a baby and a back side of a baby, caster holders provided at the
5 respective front legs and the respective rear legs, each having a lock member, caster shafts provided at the respective front wheels and the respective rear wheels, each slidably moving within the corresponding caster holder, and having an engagement portion to be engaged with the lock member and
10 a lock change operation mechanism for activating the lock members in the caster holders of the front legs and the lock members in the caster holders of the rear legs, wherein the lock change operation mechanism is interlocked with the hand push rod to be swung.

15 The stroller according to the present invention,
 wherein when the hand push rod is positioned at the back side of the baby, the lock change operation mechanism is activated to release the lock members in the caster holders of the respective front wheels from the engagement portions
20 of the caster shafts, and to engage the lock members in the caster holders of the respective rear wheels with the engagement portions of the caster shafts, and wherein when the hand push rod is positioned at the facing side of the baby, the lock change operation mechanism is activated to
25 engage the lock members in the caster holders of the respective front wheels with the engagement portion of the caster shafts, and to release the lock members in the caster holders of the respective rear wheels from the engagement portions of the caster shafts.

30 The stroller according to the present invention,
 wherein the lock mechanism includes a lead wire disposed between the caster holder provided at one of the front legs and the caster holder provided at one of the rear legs, and connecting the lock members in the caster holders, and a lead
35 wire disposed between the caster holder provided at the other front leg and the caster holder provided at the other rear leg, and connecting the lock members in the caster holders.

The stroller according to the present invention, wherein each lead wire includes a front lead wire of the front wheel side and a rear lead wire of the rear wheel side connected to the front lead wire through a connector.

5 The stroller according to the present invention, wherein a change operation member is connected to the connector.

The stroller according to the present invention, wherein the change operation member includes a projecting
10 piece, and the hand push rod includes a projecting portion to be in contact with the projecting piece of the change operation member.

The stroller according to the present invention, wherein each lead wire is urged to one side by a lead wire
15 spring.

The stroller according to the present invention, wherein the lock members in the caster holders are urged to the engagement portion side by a lock member spring.

The stroller according to the present invention, wherein the engagement portions of the caster shafts include
20 a recess to be engaged with the lock member.

The stroller according to the present invention, wherein position fixing pins are movably provided at the
25 caster shafts, and recessed groove are formed in the caster holders for engaging the position fixing pin to fix the front wheels or the rear wheels when the caster holders are lowered.

Detailed Description of the Drawings

Fig. 1 is a perspective view showing a schematic
30 structure of a stroller according to the present invention;

Fig. 2 is a side view showing the stroller;

Fig. 3 is an enlarged side view showing a connection
of a pipe and a rear leg;

Fig. 4 is a partial perspective view showing a structure
35 of a locking member and a lock release member section of a hand push rod;

Fig. 5 is an illustration view showing a swinging

operation of the hand push rod;

Fig. 6 is a side view of the stroller having the hand push rod swung to a facing side;

Fig. 7A is an enlarged section view showing a caster
5 holder of a front wheel;

Fig. 7B is an enlarged section view showing a caster holder of a rear wheel;

Fig. 8A is a view showing a lock change operation member in a state of back side pushing;

10 Fig. 8B is a view showing the lock change operation member in a state of facing side pushing;

Fig. 9A is a view showing the front wheel in the locked state when facing side pushing;

15 Fig. 9A is a view showing the front wheel in the lock released state when facing side pushing;

Fig. 10 is a section view showing a caster holder of another embodiment according to the present invention; and

Fig. 11 is an illustration view showing an operation of the caster holder shown in Fig. 10.

20

Detailed Description of the Invention

Embodiments according to the present invention will be described hereinafter with reference to the attached drawings.

25 Fig. 1 is a perspective view showing a schematic structure of a stroller according to the present invention, and Fig. 2 is a side view thereof. A stroller 10 includes a pair of right and left front legs 12 having front wheels 11, a pair of right and left rear legs 14 having rear wheels
30 13, a hand push rod 15 bent substantially in a U shape, a pair of right and left arm rests 16, and right and left pipes 17 extending parallel to each other, to which one end of the respective arm rests 16 pivotally mounted.

35 The front legs 12 are pivotally mounted to the other ends of the respective arm rests 16. An arcuate bendable guard arm 18 is detachably extended between the right and left tip ends of the arm rests 16. Top ends of the rear legs 14

are pivotally mounted to the right and left arm rests 16. The right and left front legs 12 are connected by a front connection bar 20 having a foot rest plate 19. The right and left rear legs 14 are connected by a rear connection bar 21. Front ends of connection bars 22 are pivotally mounted to the center portions of the respective front legs 12. The rear ends of the connection bars 22 are pivotally mounted to rear leg support members 23 each secured to the lower portions of the pipes 17. The right and left connection bars 22 are connected by an upper connection bar 24. A stroller body 10a is composed of the front legs 12, the rear legs 14, the arm rests 16, the pipes 17, and connection bars 20, 21, 22, 24 connecting these components. The hand push rod 15 is capable of swinging with respect to the stroller body 10a.

As specifically enlarged in Fig. 3, L-shaped brackets 25 have their bottom ends pivotally mounted to the rear legs 14. The center portions of the rear legs 14 are pivotally mounted to the rear leg support members 23. Cut staged portions 25a are provided at open ends of the brackets 25, which are to be engaged with locking staged portions 26a of lock members 26 for locking the rear legs 14 to the pipes 17. The lock members 26 are slidably mounted to the pipes 17, and are operated to be slid upward and downward along the pipes 17 by a remote operation device provided at the hand push rod 15. The rear leg support members 23 have staged portions 23a formed at the surfaces facing the rear legs 14 for contacting the rear legs 14 when developing the stroller to keep the developed state.

As shown in Fig. 3, when the lock members 26 are engaged with the cut staged portions 25a of the L-shaped brackets 25, the rear legs 14 and the pipes 17 are locked through the brackets 25, thus the stroller body is retained in the usable developed state. On the other hand, when the lock members 26 are lifted up by means of the remote operation device provided at the hand push rod 15 as shown by the dashed line, the lock members 26 is released from the cut staged portions 25a so that the arm rests 16, the front legs 12 (not shown)

and the rear legs 14 can be swung upward as shown by the dashed lines, thus the stroller body can be folded in two for a convenient portage, or the like.

As shown in Fig. 1, the lower ends of the U-shaped hand
5 push rod 15 are pivotally mounted to the outer surfaces of
the rear leg support members 23 secured respectively to lower
portions of the right and left pipes 17 to be capable of
swinging frontward and backward about shafts 27. Locking
projections 28, 29 projected in lateral directions are
10 securely provided at the outer surfaces of the arm rests 16
on the front end portions and rear end portions thereof.
Locking members 30 to be engaged with the locking projections
28 or 29 are provided at the hand push rod 15 to be slidable
therealong (Figs. 4 and 5). The locking members 30 are urged
15 downward by means of springs 34.

As shown in Fig. 5, L-shaped first recesses 31 for
engagement are provided on the surfaces facing the pipes 17
of the locking members 30, which are extended upward and
downward and have open portions 31a opened backward at the
20 lower end portions thereof. Second recesses 32 for
engagement are provided at the lower of the first recesses
31 of the locking members 30, which are extended upward and
downward, and opened frontward and downward.

When the locking members 30 are lifted upward by the
25 remote operation device provided at the hand push rod 15 to
swing the hand push rod 15 backward, as shown in Fig. 5, the
locking projections 29 are inserted in the first recesses
31 through the backward open portions 31a of the first
recesses 31. Then, the locking projections 29 are engaged
30 with the first recesses 31 by the downward movement of the
locking members 30. Thus, the hand push rod 15 is secured
in a backward swung position or back side pushing state, as
shown in Fig. 2. On the other hand, as shown by the chain
line in Fig. 5, when the locking members 30 are lifted upward
35 to swing the hand push rod 15 forward, the second engagement
recesses 32 are engaged with locking projections 28. Then,
the hand push rod 15 is secured in a forward swung position

or facing side pushing state, as shown in Fig. 6, by the downward movement of the locking members 30.

As shown in Fig. 4, lock release members 33 operated by the remote operation device are slidably mounted to the hand push rod 15 to be slidable therealong at the lower of the locking members 30. The lock release members 33 are urged downward by the springs 34 provided in the hand push rod 15, and have projected lock release rods 35 at the outer surfaces thereof. The lock members 26 have working plates 36 projected therefrom at the upper of the lock release rods 35. When the lock release members 33 are lifted upward together with the lock release rods 35, the lock members 26 are lifted upward through the working plates 36 and the lock of the brackets 25 is released. Thus, the stroller can be folded, as stated above.

Figs. 7A and 7B are enlarged views each showing a front wheel portion, and rear wheel portion of the stroller according to the present invention. Caster holders 40a, 40b are respectively secured to the lower end portions of the front legs 12 and the rear legs 14 of the stroller. Plumb portions directed to a vertical direction are formed in curves at the lower half portions of the caster holders 40a, 40b. Cylindrical spaces 41a, 41b with the lower end surfaces opened are formed at the plumb portions of the caster holders 40a, 40b. Caster shafts 43a, 43b are mounted in the spaces 41a, 41b rotatably about axes of the caster holders 40a, 40b, which are projected from caster bodies 42a, 42b pivotally mounted at each one side the front wheels 11 or rear wheels 13 by horizontal shafts 11a, 13b. Staged portions 44a, 44b are formed at the lower portions of the caster shafts 43a, 43b of the caster bodies 42a, 42b, which contact the lower end peripheral portions of the caster holders 40a, 40b. Recesses 45a, 45b are formed on the staged portions 44a, 44b, which are to be engaged with locking members, which will be described hereinafter, when the front wheels 11 and the rear wheels 13 are directed to advancing direction.

Lock member receivers 46a, 46b extended upward and

downward are formed at opposing surfaces of the front caster holders 40a and the rear caster holders 40b. Lock members 47a, 47b are provided slidably upward and downward in the lock member receivers 46a, 46b. The lock members 47a, 47b
5 are connected to springs (lock member springs) 48a, 48b, respectively, and urged downward by the springs 48a, 48b.

Ends of lead wires 50a, 50b are connected to the respective lock members 47a, 47b. The lead wires 50a connected to the front lock members 47a are inserted through
10 the front legs 12. Similarly, the lead wires 50b connected to the rear lock members 47b are inserted through the rear legs 14. As shown in Fig. 2, the other ends of the lead wires 50b are inserted in the front legs 12 through in the arm rests 16, and are interconnected with the front lead wires 50a by
15 connection means 51 (Fig. 8) in the front legs 12.

Figs. 8A and 8B are enlarged section views showing detailed connections of the lead wires 50a and the lead wires 50b. The connection means 51 are disposed in the front legs 12 to be slidably therealong with the ends of the lead wires 50a and the ends of the lead wires 50b mounted thereto. As
20 shown in Fig. 8A, connection means guide members 53 disposed in the front legs 12 are connected to pivotal shafts 52 through which the top ends of the front legs 12 are pivotally mounted to the arm rests 16. Elongated grooves 53a are formed in the connection means guide members 53. The connection means 51 can be slid along the elongated grooves 53a. Lock change operation members 54 are slidably fixed to the front legs 12. The connection means 51 and the lock change operation members 54 are connected by shafts 55 inserted through
30 elongated grooves 12a in the front legs 12. The connection means 51 are urged upward by springs (lead wire springs) 56 provided between the connection means 51 and the connection means guide members 53. Projecting pieces 54a projected outward are provided integrally with the lock change operation members 54. When the hand push rod 15 is swung forward, projecting portions 57 (Fig. 8B) provided at the hand push rod 15 contact the projecting pieces 54a, and the
35

connection means 51 are moved downward resisting the force of the springs 56 through the lock change operation members 54.

As shown in Fig. 2, in the back side pushing state where
5 the hand push rod 15 is bent backward to be positioned at a back side of a baby B, the lock members 47a are lifted upward by the springs 56 through the lead wires 50a so that the lock of the caster bodies 42a of the front wheels 11 is released, as shown in Fig. 7A. Thus, the front wheels 11 can freely
10 rotate about the vertical axes. On the other hand, as shown in Fig. 7B, the lock members 47b of the rear wheels 13 are moved downward by the springs 48b to be engaged with the recesses 45b of the caster shafts 43b of the rear caster bodies 42b. Thus, the rear wheels 13 are prevented from rotating
15 about the vertical axes, because the rear caster bodies 42b are locked. In this way, in the back side pushing state, only the front wheels 11 are turnable, and the direction of the stroller 10 can be freely changed.

As shown in Fig. 6, in the facing side pushing state
20 where the hand push rod 15 is swung forward to be positioned at the facing side of the baby B, the projecting portions 57 provided at the hand push rod 15 contact the projecting pieces 54a of the lock change operation members 54 to force the lock change operation members 54 downward. Thus, the
25 lock members 47a are forced downward by the springs 48a, and the lock members 47a are engaged with the recesses 45a of the caster bodies 42a, so that the caster bodies 42a are locked, as shown in Fig. 9A. On the other hand, the lock members 47b of the rear wheels 13 are lifted upward by the lead wires
30 50b, and the lock members 47b are released from the recesses 45b, as shown in Fig. 9B. Thus, the caster bodies 42b of the rear wheels 13, which are on the front side in the advancing direction, can rotate about the vertical axes. The caster bodies 42a of the front wheels 11, which are on the rear side
35 in the advancing direction, are locked.

Thus, both in the back side pushing state and the facing side pushing state, only the wheels on the front sides in

the advancing direction become turnable, and the wheels of the rear sides are locked. Therefore, the change operation of direction can be readily performed both in the back side pushing state and the facing side pushing state.

5 Fig. 10 is a view showing another embodiment according to the present invention. Caster holders 40a are secured to lower end portions of front legs 12. Cylindrical spaces 60 are formed in the caster holders 40a and have lower end surfaces opened. Caster shafts 43a are provided in the
10 spaces 60 to be rotatable about the axes and slidable along the inner surfaces of the spaces 60. The caster shafts 43a are fixed to front wheels 11 by horizontal shafts 11a at their sides.

Recesses 61 extended in circumferential directions are
15 provided at the upper outer surfaces of the caster shafts 43a. Control pins 62 are inserted in the recesses 61 which are provided at the caster holders 40a and extended horizontally. Since the upper and lower staged portions of the recesses 61 are engaged with the control pins 62, an upward
20 and downward sliding range of the caster shafts 43a is defined. Front wheel advancing state position fixing pins 63 are provided at the caster shafts 43a, which can move forward and backward in radial directions of the caster shafts 43a. The position fixing pins 63 are urged to be projected outward
25 by springs 64 provided in the caster shafts 43a.

Recessed grooves 65 are provided at the lower inner surfaces of the spaces 60 of the caster holders 40a, which are to be engaged with the position fixing pins 63 of the front wheel, when the caster shafts 43a along with front
30 wheels 11 are in the lowered positions and the front wheels 11 are directed to an advancing direction. The recessed grooves 65 are axially extended. Slants directed to the inner surfaces of the spaces 60 of the caster holders 40a are formed at the upper end portions of the recessed grooves
35 65.

When the stroller 10 is used, as the front wheels 11 are in contact with grounds, the front legs 12 are moved

downward. Namely, the caster shafts 43a are positioned relatively higher positions with respect to the caster holders 40a. As shown in Fig. 10, the front wheel position fixing pins 63 are in contact with the inner surfaces of the spaces 60, and are rotatable along the inner surfaces of the spaces 60.

On the other hand, when the front wheels 11 are brought upward by the hand push rod 15 for folding the stroller 10, the front wheels 11 as well as the caster shafts 43b are lowered with respect to the caster holders 40a because of the dead loads of the front wheels 11. In this state, when the front wheels 11 are swung to be directed to the advancing direction, the advancing state position fixing pins 63 of the front wheel are projected by springs 64 to be engaged with the recessed grooves 65, so that the front wheels are secured in the state where the front wheels 11 are directed to the advancing direction. Thus, when folded, the stroller can be prevented from being folded with the front wheels 11 connected to the caster shafts 43a not being in the advancing positions.

As is structured above, by moving upward or downward lock change operation members slidably provided at front legs, lock members provided at sides of the front legs or rear legs can be selectively engaged with recesses provided at caster shafts through lead wires inserted through the front legs and rear legs. Thus, in both the back side pushing state and the facing side pushing state of a stroller, only wheels of the front side in the advancing direction can rotate around the vertical axes. Therefore, the stroller is smoothly moved, while the direction thereof can be always easily changed during its movement. Lead wires inserted through the front legs and the rear legs are connected to connection means disposed in the front legs, and the connection means are arranged to be moved by the lock change operation members. As the connection means of the lead wires and the lock change operation members are disposed in the front legs, and the lock change operation members alone are slidably provided

12

to the front legs, appearance of the stroller becomes good,
and operation mistake can be eliminated.

Claims:

1. A stroller comprising:

a stroller body including a pair of front legs each having a front wheel and a pair of rear legs each having a rear wheel;

a hand push rod swingably provided to the stroller body, capable of being positioned at a facing side of a baby and a back side of a baby;

caster holders provided at the respective front legs and the respective rear legs, each having a lock member;

caster shafts provided at the respective front wheels and the respective rear wheels, each slidably moving within the corresponding caster holder, and having an engagement portion to be engaged with the lock member; and

a lock change operation mechanism for activating the lock members in the caster holders of the front legs and the lock members in the caster holders of the rear legs;

wherein the lock change operation mechanism is interlocked with the hand push rod to be swung,

wherein position fixing pins are movably provided at the caster shafts, and recessed groove are formed in the caster holders for engaging the position fixing pin to fix the front wheels or the rear wheels when the caster holders are lowered.

2. The stroller according to claim 1,

wherein when the hand push rod is positioned at the back side of the baby, the lock change operation mechanism is activated to release the lock members in the caster holders of the respective front wheels from the engagement portions of the caster shafts, and to engage the lock members in the caster holders of the respective rear wheels with the engagement portions of the caster shafts,

and wherein when the hand push rod is positioned at the facing side of the baby, the lock change operation mechanism is activated to engage the lock members in the caster holders of the respective front wheels with the engagement portion of the caster shafts, and to release the lock members in the caster holders of the respective rear wheels from the engagement portions of the caster shafts.

3. The stroller according to claim 1,

wherein the lock mechanism includes a lead wire disposed between the caster holder provided at one of the front legs and the caster holder provided at one of the rear legs, and connecting the lock members in the caster holders; and

a lead wire disposed between the caster holder provided at the other front leg and the caster holder provided at the other rear leg, and connecting the lock members in the caster holders.

4. The stroller according to claim 3,
wherein each lead wire includes a front lead wire of the front wheel side and a rear lead wire of the rear wheel side connected to the front lead wire through a connector.
5. The stroller according to claim 4,
wherein a change operation member is connected to the connector.
6. The stroller according to claim 5,
wherein the change operation member includes a projecting piece, and the hand push rod includes a projecting portion to be in contact with the projecting piece of the change operation member.
7. The stroller according to claim 6,
wherein each lead wire is urged to one side by a lead wire spring.
8. The stroller according to claim 1,
wherein the lock members in the caster holders are urged to the engagement portion side by a lock member spring.
9. The stroller according to claim 1,
wherein the engagement portions of the caster shafts include a recess to be engaged with the lock member.