

DESCRIPTION

STROLLER

Technical Field

[0001]

The present invention relates to a stroller in which wheels can be switched between a locked state and an unlocked state of turning with respect to legs according to a position of a handle.

Background Art

[0002]

There is a known stroller in which a position of a handle can be changed according to a direction in which the stroller is pushed so that the stroller can be pushed from behind with respect to a traveling direction. Wheels of the stroller can be switched, in response to a change in the position of the handle, between a locked state in which movement of the wheels are restricted so that the wheels can turn only in the traveling direction and an unlocked state in which the wheels can turn leftward and rightward with respect to the traveling direction. For example, there is a known stroller in which front legs are provided with lock switch operating members for switching wheels between a locked state and an unlocked state of leftward and rightward turning with respect to the traveling direction and rear legs are provided with a handle which is mounted to be able to swing around shafts and which is used to operate the lock

switch operating members (see Patent Document 1).

[0003]

Patent Document 1: JP-A-2002-284015

Disclosure of Invention

Problem to be Solved by the Invention

[0004]

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In the stroller the Patent Document 1, the lock switch operating members provided to the front legs are operated by pressing with the handle provided to the rear legs to be able to swing around the shafts as fulcrums, thereby increasing distances between the lock switch operating members and the fulcrums. Accordingly, in the case, for example, that play in rotation of the handle around the fulcrums is great, it may reduce reliability of operation of the lock switch operating members by a means of the handle.

[0005]

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Therefore, it is an object of the present invention to provide a stroller in which switching of states of wheels according to change in a handle position can be carried out more certainly.

Means for Solving the Problem

[0006]

To solve the above described problem, there is provided a stroller according to the present invention which includes a frame portion having front legs and rear legs, front wheels

provided to lower ends of the front legs, rear wheels provided to lower ends of the rear legs, and a handle portion supported on support portions provided to the rear legs to be able to swing forward and backward. At least the front wheels or the rear wheels are swivel wheels and the stroller further includes lock devices to be switched between lock positions for preventing swiveling of the swivel wheels and unlock positions for allowing swiveling of the swivel wheels. The stroller includes motion converting devices provided to the rear legs to convert swinging motion of the handle portion into motion in a direction along the rear legs and motion transmitting devices for transmitting the motion converted by the motion converting devices to the lock devices so that the lock devices are switched to the lock positions or the unlock positions in response to the swinging operation of the handle portion.

[0007]

In the stroller according to the present invention, since both the support portions for supporting the handle portion and the motion converting devices are provided to the rear legs, it is possible to provide the motion converting devices near the support portions. In this case, it is possible to switch the lock devices near the support portions and therefore it is possible to certainly switch the lock devices to the lock positions or the unlock positions with the handle, even if there is much play in swinging of the handle.

[0008]

In one embodiment of the stroller according to the present

invention, the motion transmitting devices may be wires having one ends connected to the motion converting devices and the other ends connected to the lock devices. In this case, it is possible to increase a degree of freedom in installation of the motion transmitting devices.

[0009]

In this embodiment, the front wheels may be swivel wheels, the lock devices may be provided to the lower ends of the front legs, and the wires may be routed via the upper ends of the front legs and the rear legs, respectively, or may be housed in the front legs and the rear legs. By routing the wires in this manner, it is possible to suppress exposure of the wires to the outside. In this way, it is possible to make things less likely to get tangled in the wires to thereby prevent a malfunction and improve an outward appearance of the stroller.

[0010]

In an embodiment of the stroller according to the present invention, both the front wheels and rear wheels may be swivel wheels, the lock devices for the front wheels may be provided to the lower ends of the front legs and the lock devices for the rear wheels may be provided to the lower ends of the rear legs, the lock devices may prohibit swiveling of the swivel wheels in a state in which the swivel wheels are oriented in the front-rear direction of the stroller, and the motion transmitting devices may transmit the motion converted by the motion converting devices to the lock devices to switch the lock devices for the front wheels to the lock positions and to switch the lock devices

for the rear wheels to the unlock positions when the handle portion is swung forward with respect to the stroller while to switch the lock devices for the front wheels to the unlock positions and to switch the lock devices for the rear wheels to the lock positions when the handle portion is swung rearward with respect to the stroller. In this case, if the handle portion is tilted to the side of the front legs, the front wheels are prevented from turning with respect to the front legs in the state in which the front wheels are oriented in the front-rear direction of the stroller and the rear wheels are allowed to turn with respect to the rear legs. Therefore, it is possible to improve operability of the stroller in pushing the stroller to the side of the rear legs. On the other hand, if the handle portion is tilted to the side of the rear legs, the front wheels are allowed to turn with respect to the front legs and the rear wheels are prevented from turning with respect to the rear legs in the state in which the rear wheels are oriented in the front-rear direction of the stroller. Therefore, it is possible to improve operability of the stroller in pushing the stroller to the side of the front legs.

[0011]

In an embodiment of the stroller according to the present invention, the handle portion may be provided to be able to swing about fulcrums provided to the support portions and each of the motion converting devices may include a cam that rotates about the fulcrum with the handle portion and a sliding member provided to the rear leg to be slid by the cam in a direction along the

rear leg. By providing the cams in this manner, it is possible to switch the states of the lock devices near the fulcrums of the handle portion.

Effects of the Invention

[0012]

As described above, according to the stroller in the invention, the motion converting devices are provided to the rear legs and therefore it is possible to switch the states of the wheels near the fulcrums of the handle portion. As a result, it is possible to more certainly switch the states of the wheels according to the position of the handle portion than in prior art.

Brief Description of Drawings

[0013]

FIG. 1 is a view showing an essential portion of a stroller according to an embodiment of the present invention.

FIG. 2 is a view showing an outward appearance of a front wheel portion.

FIG. 3 is a view showing an internal structure of the front wheel portion.

FIG. 4 is a view showing an outward appearance of a rear wheel portion.

FIG. 5 is a view showing an internal structure of the rear wheel portion.

FIG. 6 is an enlarged view of a lock switch mechanism when

a handle is in a second position.

FIG. 7 is an enlarged view of the lock switch mechanism when the handle is in a first position.

FIG. 8 is a view showing another example of the lock switch mechanism.

Best Mode for Carrying Out the Invention

[0014]

FIG. 1 is a side view of an essential portion of a stroller according to an embodiment of the present invention. As shown in FIG. 1, the stroller 1 has a pair of front legs 2 and a pair of rear legs 3, and is provided with a main body frame 4 on which a seat portion (not shown) for an infant to sit upon is mounted and a handle 6 as a handle portion to be operated by a user. The handle 6 can swing in a direction of an arrow A and a direction of an arrow B in FIG. 1, i.e., in a front-rear direction with respect to the stroller 1 about rotating shafts 5 as fulcrums, and the rotating shafts 5 are supported on brackets 9 as support portions provided to the pair of rear legs 3, respectively. The stroller 1 is configured so as to be capable of being expanded and collapsed, and the brackets 9 are provided to the rear legs 3 so as to be rotated in association with user's operation when the stroller is expanded or collapsed. A front wheel portion 7 is provided to a lower end 2a of each front leg 2 and a rear wheel portion 8 is provided to a lower end 3a of each rear leg 3. These portions may be similar to those of a known stroller and will not be described in detail.

[0015]

With reference to FIGS. 2 and 3, the front wheel portion 7 will be described. FIG. 2 shows an outward appearance of the front wheel portion 7 and FIG. 3 shows an internal structure of the front wheel portion 7. As shown in FIGS. 2 and 3, the front wheel portion 7 includes a caster main body 12 that rotatably supports a front wheel 11 in a direction of an arrow C and a direction of an arrow D, a caster holder 13 which is mounted to the lower end 2a of the front leg 2 and in which the caster main body 12 is rotatably fitted in a direction of an arrow E and a direction of an arrow F, i.e., with respect to the front leg 2, a shaft 14 rotatably fitted to each of the caster main body 12 and the caster holder 13, and a brake 15 for stopping rotation of the front wheel 11. Since the caster main body 12 is fitted in the caster holder 13 in this way, the front wheel 11 serves as a swivel wheel. These portions may be similar to those of a known caster for the stroller and will not be described in detail.

[0016]

The caster holder 13 is provided with a lock member 16 as a lock device. The lock member 16 is mounted on the caster holder 13 in a rotatable manner about one end 16a and can be switched between a lock position P11 and an unlock position P12 shown in FIG. 3. The lock member 16 is connected to a lock switch operating member 32 (described later) by a front wheel lead wire 17 as a motion transmitting device. As shown in FIG. 1, the front wheel lead wire 17 is housed in the front leg 2 and the

rear leg 3 and is routed from the lock switch operating member 32 to the front wheel portion 7 via an upper end 3b of the rear leg 3 and an upper end 2b of the front leg 2. The caster main body 12 has a recessed portion 12a in which the lock member 16 can fit. When the lock member 16 is switched to the lock position P11, the lock member 16 fits in the recessed portion 12a to prohibit rotation of the caster main body 12 with respect to the caster holder 13. In other words, rightward and leftward turning of the front wheel 11 with respect to the front-rear direction of the stroller 1 is prohibited. In the following description, the state in which the rotation of the caster main body 12 is prohibited may be referred to as a locked state in some cases. The recessed portion 12a is provided on a caster main body 12 so as to prohibit rotation of the caster main body 12 in the locked state in which the front wheel 11 is oriented in the front-rear direction (left-right direction in FIG. 1) of the stroller 1, i.e., the front wheel 11 can roll in the front-rear direction of the stroller 1. On the other hand, when the lock member 16 is switched to the unlock position P12, the lock member 16 is withdrawn from the recessed portion 12a and the locked state is cancelled, thereby allowing the caster main body 12 to rotate with respect to the caster holder 13.

[0017]

Next, with reference to FIGS. 4 and 5, the rear wheel portion 8 will be described. FIG. 4 shows an outward appearance of the rear wheel portion 8 and FIG. 5 shows an internal structure of the rear wheel portion 8. As shown in FIGS. 4 and 5, the rear

wheel portion 8 includes a caster main body 22 which rotatably supports a rear wheel 21 in a direction of an arrow C and a direction of an arrow D, a caster holder 23 which is mounted on the lower end 3a of the rear leg 3 and on which the caster main body 22 is rotatably mounted in a direction of an arrow E and a direction of an arrow F, a shaft 24 rotatably fitted in each of the caster main body 22 and the caster holder 23, and a brake 25 for stopping rotation of the rear wheel 21. Since the caster main body 22 is fitted in the caster holder 23 in this way, the rear wheel 21 serves as a swivel wheel. Like the front wheel portion 7, these portions may be similar to those of a known caster for the stroller as well and will not be described in detail.

[0018]

The caster holder 23 is provided with a lock member 26 as a lock device rotatably mounted about one end 26a thereof. The lock member 26 is connected to the lock switch operating member 32 by a rear wheel lead wire 27 as a motion transmitting device. When motion of the lock switch operating member 32 is transmitted by the rear wheel lead wire 27 to the lock member 26, the lock member 26 is switched between a lock position P21 and an unlock position P22. As shown in FIG. 1, the rear wheel lead wire 27 is housed in the rear leg 3. When the lock member 26 is switched to the lock position P21, the lock member 26 fits in a recessed portion 22a formed on the caster main body 22 to prohibit rotation of the caster main body 22 with respect to the caster holder 23. In the rear wheel portion 8, like in the front wheel portion 7, the recessed portion 22a is provided on

the caster main body 22 so as to prohibit rotation of the caster main body 22 in the locked state in which the rear wheel 21 is oriented in the front-rear direction (left-right direction in FIG. 1) of the stroller 1. On the other hand, when the lock member 26 is switched to the unlock position P22, the locked state of the rear wheel 21 is cancelled.

[0019]

Referring back to FIG. 1, the stroller 1 will be described further. The handle 6 can be switched between a first position P1 and a second position P2 in FIG. 1. For example, the user can switch the handle 6 to the first position P1 to push the stroller 1 from the right side in FIG. 1 and can turn the handle 6 in a direction of an arrow A in FIG. 1 to switch the handle 6 to the second position P2 to push the stroller 1 from the left side in FIG. 1. In this manner, the stroller 1 can be pushed from the left side as well as the right side in FIG. 1. At this time, by allowing the wheels on the front side in the traveling direction to turn with respect to the legs while bringing the wheels on the rear side in the traveling direction into the locked states, it is possible to improve operability of the stroller 1 during traveling. For example, if the stroller 1 travels toward the side of the front legs 2, i.e., leftward in FIG. 1, the front wheels 11 of the front wheel portions 7 are allowed to turn with respect to the front legs 2 while the rear wheels 21 of the rear wheel portions 8 are brought into the locked states. On the other hand, if the stroller 1 travels toward the side of the rear legs 3 (rightward in FIG. 1), the rear wheels 21 of the

rear wheel portions 8 are allowed to turn with respect to the rear legs 3 while the front wheels 11 of the front wheel portions 7 are brought into the locked states.

[0020]

Lock switch mechanisms 30 as motion converting devices are provided to the stroller 1 in which the states of the wheel portions 7 and 8 can be switched properly according to the position of the handle 6 as described above. As shown in enlarged views in FIGS. 6 and 7, each of the lock switch mechanisms 30 includes a cam 31 provided to the rotating shaft 5 to rotate with the handle 6, the lock switch operating member 32 as a sliding member provided to reciprocate along the rear leg 3 in a direction of an arrow G and a direction of an arrow H and having an operating portion 32a to be operated by the cam 31, a fixing member 33 fixed inside the rear leg 3, and a spring 34 provided between the lock switch operating member 32 and the fixing member 33 to bias the lock switch operating member 32 in the direction of the arrow H. The cam 31 is provided with a cam face 31a for pushing the operating portion 32a in the direction of the arrow G when the handle 6 is switched from the first position P1 to the second position P2. The lock switch operating member 32 includes a sliding portion 32b having the operating portion 32a and provided to be able to slide on an outer face 3a of the rear leg 3, a coupling device 32c which is housed in the rear leg 3 and to which one end 17a of the front wheel lead wire 17 and one end 27a of the rear wheel lead wire 27 are connected, and a coupling pin 32d for coupling the sliding portion 32b and the

coupling device 32c with each other so that they operate integrally. As shown in FIG. 6, the coupling pin 32d couples the sliding portion 32b and the coupling device 32c through a pair of slit holes 3c provided in an opposed positions on the rear leg 3.

[0021]

Next, with reference to FIGS. 6 and 7, operation of the lock switch mechanism 30 will be described in association with operation of the handle 6. FIG. 6 shows a state of an internal structure of the lock switch mechanism 30 when the handle 6 is in the second position P2 and FIG. 7 shows a state of the internal structure of the lock switch mechanism 30 when the handle 6 is in the first position P1. First, with reference to FIG. 6, the operation of the lock switch mechanism 30 when the handle 6 is switched from the first position P1 to the second position P2 will be described. When the user turns the handle 6 in the direction of the arrow A in FIG. 1 to switch it from the first position P1 to the second position P2, the cam 31 rotates in the direction of the arrow A as the handle 6 turns and, as a result, the cam 31 pushes the lock switch operating member 32 up in the direction of the arrow G in FIG. 6. This causes the coupling device 32c to move in the direction of the arrow G to thereby loosen the front wheel lead wire 17 and pull the rear wheel lead wire 27 in the direction of the arrow G. Since the other end 17b of the front wheel lead wire 17 is connected to the lock member 16 of the front wheel portion 7 as shown in FIG. 3, the lock member 16 moves to the lock position P11 to prohibit

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{ rotation of the caster main body 12 with respect to the caster holder 13 when the front wheel lead wire 17 is loosened. On the other hand, since the lock member 26 of the rear wheel portion 8 is connected to the other end 27b of the rear wheel lead wire 27 as shown in FIG. 5, the lock member 26 is switched from the lock position P21 to the unlock position P22 when the rear wheel lead wire 27 is pulled. Therefore, the locked state of the rear wheel portion 8 is cancelled. In this way, when the handle 6 is switched to the second position P2, the front wheel portion 7 is brought into the locked state and the rear wheel portion 8 is allowed to turn leftward and rightward with respect to the front-rear direction of the stroller 1, thereby improving operability in pushing the stroller 1 rightward in FIG. 1.

[0022]

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{ On the other hand, as shown in FIG. 7, when the handle 6 is turned in the direction of the arrow B in FIG. 1 and switched from the second position P2 to the first position P1, the cam 31 rotates in the direction of the arrow B as the handle 6 rotates and therefore biasing of the lock switch operating member 32 by the cam 31 in the direction of the arrow G is cancelled. In this case, the spring 34 moves the lock switch operating member 32 in the direction of the arrow H to thereby pull the front wheel lead wire 17 and loosen the rear wheel lead wire 27. Therefore, the lock member 16 of the front wheel portion 7 is switched to the unlock position P12 and the lock member 26 of the rear wheel portion 7 is switched to the lock position P21. As a result, the front wheel portion 7 is allowed to turn leftward

and rightward with respect to the front-rear direction of the stroller 1 and the rear wheel portion 8 is brought into the locked state, thereby improving operability in pushing the stroller 1 leftward in FIG. 1.

[0023]

As described above, in the stroller 1 according to the present invention, the states of the front wheel portions 7 and the rear wheel portions 8 are switched by the cams 31 provided to the rotating shafts 5 which serve as the fulcrums of turning when the handle 6 is swung. Since the lock switch mechanisms 30 are provided near the handle 6 in this manner, it is possible to certainly switch the states of the front wheel portions 7 and the rear wheel portions 8 by turning the handle 6, even if there is play in the handle 6. As shown in FIG. 1, each of the lead wires 17 and 27 is housed in the rear leg 3 and the front leg 2. Each of the front wheel lead wires 27 is routed via the upper end 3b of the rear leg 3 and the upper end 2b of the front leg 2. Therefore, it is possible to suppress exposure of each of the lead wires 17 and 27 to the outside. Therefore, it is possible to make things less likely to get tangled in the lead wires 17 and 27 to thereby prevent a malfunction. Further, it is possible to improve an outward appearance of the stroller 1.

[0024]

The present invention is not limited to the above-described embodiment but may be carried out in various embodiments. For example, in the stroller according to the present invention,

the lock members for locking turning of the wheels with respect to the legs may be provided to the front wheel portions or the rear wheel portions only. In this case, the wheels not provided with the lock mechanisms may be provided to be able to turn with respect to the legs or provided not to be able to turn with respect to the legs while oriented in the front-rear direction.

[0025]

The members for supporting the handle are not limited to the brackets. It is essential only that the handle is provided to the rear legs to be able to swing about the fulcrums near the lock switch mechanisms. Therefore, the handle may be supported on various members provided to the rear legs.

[0026]

The lock switch mechanisms are not limited to the cam mechanisms. It is possible to employ various mechanisms such as a link mechanism that can convert rotary motion into another motion. For example, as shown in FIG. 8, a pulley 41 may be provided to each of the rotating shafts 5 to rotate with the handle 6 and the pulley 41 may switch the state of each of the lock members 16 and 26 of the front wheel portion 7 and the rear wheel portion 8. In FIG. 8, portions included in common with those in FIGS. 6 and 7 are provided with the same reference numerals and will not be described. As shown in FIG. 8, the one ends 17a and 27a of the lead wires 17 and 27 are respectively connected to the pulley 41 in positions facing each other across a center of the pulley 41. In this case, by turning the handle 6, it is possible to unreel and loosen the lead wires 17 and 27 or

to reel and pull the wires 17 and 27 to thereby change the positions of the lock members of the respective wheels, respectively. Since the lock switch mechanisms are also provided near the fulcrums of the handle 6, it is possible to reliably switch the locked states of the wheels.

CLAIMS

1. A stroller comprising:
 - a frame portion having front legs and rear legs;
 - front wheels provided to lower ends of the front legs;
 - rear wheels provided to lower ends of the rear legs, at least the front wheels or the rear wheels being swivel wheels;
 - a handle portion supported on support portions provided to the rear legs to be able to swing forward and backward;
 - lock devices to be switched between lock positions for preventing swiveling of the swivel wheels and unlock positions for allowing swiveling of the swivel wheels;
 - motion converting devices provided to the rear legs to convert swinging motion of the handle portion into motion in a direction along the rear legs; and
 - motion transmitting devices for transmitting the motion converted by the motion converting devices to the lock devices so that the lock devices are switched to the lock positions or the unlock positions in response to the swinging operation of the handle portion,wherein:
 - the handle portion is provided to be able to swing about fulcrums provided to the support portions;
 - the motion transmitting devices are wires having one ends connected to the motion converting devices and the other ends connected to the lock devices;

each of the motion converting devices includes a cam that rotates about each fulcrum with the handle portion and a sliding member provided to each rear leg to be slid by the cam in a direction along the rear leg;

the sliding member comprises a sliding portion provided to be able to slide on an outer face of the rear leg, an operating portion formed on the sliding portion, and a coupling device housed in the rear leg in such a manner that the coupling device is connected to one end of one of the wires and is coupled with the sliding portion so as to be operable integrally therewith; and

a fixing member is fixed inside the rear leg and a spring is provided between the fixed member and the sliding member to bias the sliding member in a direction where the operating portion is pushed toward the cam, thereby enabling rotation of the cam about the fulcrum to be converted through the operating portion into motion of the sliding member in a direction along the rear leg.

2. The stroller according to claim 1, wherein the front wheels are the swivel wheels, the lock devices are provided to the lower ends of the front legs, and the wires are routed via the upper ends of the front legs and the rear legs, respectively.

3. The stroller according to claim 2, wherein the wires are housed in the front legs and the rear legs.

4. The stroller according to anyone of claims 1 to 3, wherein both the front wheels and rear wheels are the swivel wheels, the lock devices for the front wheels are provided to the lower ends of the front legs and the lock devices for the rear wheels are provided to the lower ends of

the rear legs, the lock devices prohibit swiveling of the swivel wheels in a state in which the swivel wheels are oriented in the front-rear direction of the stroller, and the motion transmitting devices transmit the motion converted by the motion converting devices to the lock devices to switch the lock devices for the front wheels to the lock positions and to switch the lock devices for the rear wheels to the unlock positions when the handle portion is swung forward with respect to the stroller while to switch the lock devices for the front wheels to the unlock positions and to switch the lock devices for the rear wheels to the lock positions when the handle portion is swung rearward with respect to the stroller.