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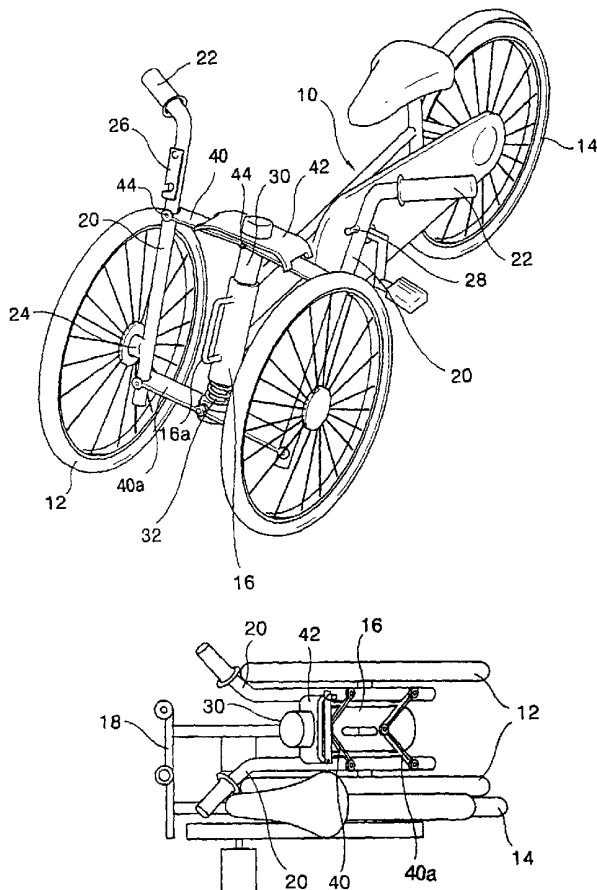
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(54) Title: COLLAPSIBLE TRICYCLE



(57) Abstract: Disclosed is a collapsible tricycle including a support frame which has a sleeve with a handle bar formed at its forward portion and a hinge member installed around its center so as to be folded in either side, and on which a pair of laterally spaced front wheels and a rear wheel are disposed, handle frames each having a handgrip provided at its upper part and an extension for supporting the front wheels, provided at its lower part, a connection rod fitted into the sleeve of the support frame and having an absorbing means, and upper and lower support plates which are hinged with the handle frame and the connection rod, respectively, and are foldable upward, for supporting the connection rod. Since two wheels are disposed at the forward portion of the support frame and one wheel is disposed at the rearward portion of the support frame, running safety while moving on a curved road as well as a straight road can be attained. Also, both the width and length of the entire tricycle structure can be simply reduced.



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COLLAPSIBLE TRICYCLE

Technical Field

The present invention relates to a collapsible three-wheeled vehicle, i.e., tricycle, and more particularly, to a collapsible tricycle having two laterally spaced front wheels and one rear wheel, which can reduce a space between the front wheels and which is
5 configured such that a support frame can be folded.

Background Art

A tricycle generally includes one front wheel disposed near a forward portion of a support frame and two rear wheels disposed near a rearward portion of the support frame.
10 There have been developed various kinds of tricycles, including children's tricycles, adult's tricycles improved over ordinary bicycles, and the like.

A conventional tricycle having a single front wheel, is disadvantageous in that running safety is deteriorated when approaching a sharp turn. When brake is applied to a moving vehicle without locking, more than two third a braking force is applied to the front
15 wheel. In the conventional tricycle, if a front brake system is abruptly put on, the tricycle may slip forward, resulting in insecure braking.

Also, in the conventional collapsible tricycle configured to be folded by changing a space between two laterally spaced rear wheels, a handle having a predetermined length is installed on a support frame and protrudes outward even in the folded state, thus making
20 the tricycle bulky.

Disclosure of the Invention

In view of the foregoing, it is a first object of the present invention to provide a collapsible tricycle which can improve running safety even while moving around a curve by installing two wheels at the forward portion of a support frame, and which can secure
25 braking stability during abrupt brake.

It is a second object of the present invention to provide a collapsible tricycle which can reduce the length of a handle by reducing a space between two laterally spaced front

wheels and which can greatly reduce the whole length of the tricycle by folding a support frame.

To accomplish the above objects, there is provided a collapsible tricycle including a support frame which has a sleeve with a handle bar formed at its forward portion and a hinge member installed around its center so as to be folded in either side, and on which a pair of laterally spaced front wheels and a rear wheel are disposed, handle frames each having a handgrip provided at its upper part and an extension for supporting the front wheels, provided at its lower part, a connection rod fitted into the sleeve of the support frame and having an absorbing means, and upper and lower support plates which are hinged with the handle frame and the connection rod, respectively, and are foldable upward, for supporting the connection rod.

In the handle frame, each locking device for locking or unlocking the handle frames such that one side handle frame is latched to the other, is preferably provided, so that a space between the front wheels can be maintained constantly in a state in which the upper and lower support plates are folded. Also, the handle frames are preferably tilted at a predetermined angle in a rearward direction of a vertical center axis of the front wheels.

In the collapsible tricycle according to the present invention, if the handle of the sleeve is lifted, the upper and lower support plates are folded due to the weight of either front wheel. If the fixation pin is disengaged to unfold the hinge member, the length of the support frame is reduced. Thus, both the width and the whole length of the tricycle can be simply reduced. Also, since two wheels are provided at the forward portion of the tricycle, running safety on a curved road as well as a straight road can be secured.

Brief Description of the Drawings

The above objects and advantages of the present invention will become more apparent by describing in detail preferred embodiments thereof with reference to the attached drawings in which:

FIG. 1 is a perspective view of a collapsible tricycle according to the present invention;

FIG. 2 is a side view of the collapsible tricycle shown in FIG. 1;

FIG. 3 is a front view of the collapsible tricycle shown in FIG. 1;

FIGS. 4A and 4B are partially enlarged views of the collapsible tricycle shown in FIG. 1, illustrating a state in which a support frame is connected thereto, and a state in which the support frame is unfolded, respectively;

FIGS. 5A and 5B are front views of the collapsible tricycle shown in FIG. 1, illustrating a state in which upper and lower support plates are unfolded, and a state in which the upper and lower support plates are folded, respectively; and

FIGS. 6A and 6B are views of the collapsible tricycle shown in FIG. 1, illustrating a state in which a space between front wheels is reduced, and a state in which the length of a support frame is reduced, respectively.

10 Best Mode for Carrying out the Invention

A preferred embodiment of the present invention will now be described in detail with reference to the accompanying drawings.

As shown in FIGS. 1 through 3, a collapsible tricycle according to the present invention includes a pair of front wheels 12 spaced apart by a predetermined space at the forward portion of a support frame 10, and a rear wheel mounted at the rearward portion of the support frame 10. Here, the front wheels 12 are fixedly engaged with independent handle frames 20, which are connected to the support frame 10 by means of a connection rod 30 and upper and lower support plates 40 and 40a.

The support frame 10 has a sleeve 16 formed at its forward portion so that the connection rod 30 is fitted into the sleeve 16, and is folded such that it rotates by 180° about a hinge member (18 of FIG. 4A) installed around the center of the support frame 10, when a fixation pin (18a of FIG. 4A) is disengaged. As shown in FIG. 4A, if the fixation pin 18a is engaged with the hinge member 18, the support frame 10 is configured such that the front and rear parts of the hinge member 18 is disposed straight. On the other hand, as shown in FIG. 4B, if the fixation pin 18a is disengaged, the support frame 10 is disposed in parallel with the hinge member 18 with a predetermined space. Here, the support frame 10 is configured to be of a two-step rod type for the purpose of preventing intensive load from being applied to the joint portion between the support frame 10 and the hinge member 18. Thus, the support frame 10 is preferably formed of a strong, lightweight material. A handle bar 16a is disposed at the front of the sleeve 16. If a rider holds and lifts upward the handle bar 16a, the upper and lower support plates 40 and

40a are folded due to the weight of the front wheels 12, thereby easily reducing the space between the two spaced-apart front wheels 12.

Each of the handle frames 20 has a handgrip 22 provided at its upper part, and an extension 24 for supporting the front wheels 12, provided at its lower part, thereby separately supporting the front wheels 12. Also, each locking device for locking or unlocking the handle frames 20 is provided. In other words, a latching bar 26 is installed at the front of one handle frame 20, and is selectively latched with a fixing protrusion 28 installed at the other handle frame 20. In a state in which the space between both side handle frames 20 is reduced, the latching bar 26 is locked with the fixing protrusion 28. The handle frames 20 are tilted at a predetermined angle in a rearward direction of a vertical center axis of the front wheels 12. The reason of making the handle frames 20 tilt is to facilitate rider's mounting or dismounting and to improve steerability by reducing a force required in maneuvering the handle on a curved road.

Referring to FIGS. 5A and 5B, the connection rod 30 is fitted into the sleeve 16 of the support frame 10, and includes an absorbing means at its lower part. The connection rod 30 primarily supports the upper and lower support plates 40 and 40a, and secondarily absorbs and mitigates shock applied to the front wheels 12 by means of the absorbing means. The absorbing means, for example, an absorbing spring 32, installed at the lower part of the connection rod 30 into which the sleeve 16 of the support frame 10 is fitted, absorbs shock. Alternatively, the absorbing means may absorb shock by injecting hydraulic pressure or gas into the connection rod 30.

The upper and lower support plates 40 and 40a are hinged on the handle frames 20 and the connection rod 30, respectively so as to be folded upward and to support the connection rod 30, which will now be described in more detail with reference to FIGS. 5A and 5B. The upper and lower support plates 40 and 40a are configured to connect the handle frames 20 with the connection rod 30 by means of connection pins 44. Thus, if a user holds and lifts the handle bar 16a of the sleeve 16, the front edges of the upper and lower support plates 40 and 40a connected to the connection rod 30 are lifted upward due to own weight of the front wheels 12 to then be folded. A fixed plate 42 is provided lengthwise on the top surface of the upper support plate 40, in a state in which it is fitted into the upper edge of the connection rod 30. The fixed plate 42 prevents the upper and lower support plates 40 and 40a from being bent downward and folded when they are

unfolded. When the upper and lower support plates 40 and 40a are unfolded, a portion connected with the connection rod 30 is preferably formed relatively higher than a portion connected with the handle frames 20.

5 FIG. 6A illustrates a state in which a space between the front wheels 12 is reduced, in which the upper and lower support plates 40 and 40a are folded. In order to reduce the space between the front wheels 12, the space between the front wheels 12 can be easily reduced just by holding and lifting the handle bar 16a of the sleeve 16 so that the upper and lower support plates 40 and 40a can be folded, as shown in FIGS. 4A and 4B. In this case, the handle does not protrude outward because of both side handle frames 20 disposed near
10 each other. Also, the tricycle can be folded into a compact configuration for storage in a state in which the space between the front wheels 12 is reduced, by fixedly locking the latching bar 26 installed at one handle frame 20 to the fixing protrusion 28 installed at the other handle frame 20.

FIG. 6B illustrates a state in which the length of a support frame is reduced, in
15 which the whole length of the tricycle is reduced, by collapsing a connected portion of the support frame 10 by unfolding the hinge member 18. In collapsing the support frame 10, the fixing pins 18a fitted into the hinge member 18 are removed to unfold the hinge member 18, as shown in FIGS. 4A and 4B, so that the support frame 10 is collapsible by a predetermined space. Eventually, the whole length of the tricycle can be reduced as much
20 as the support frame 10 is collapsed.

According to the present invention, if the handle bar 16a of the sleeve 16 is lifted, the space between the handle frames 20 is reduced such that the upper and lower support plates 40 and 40a are folded due to the own weight of the front wheels 12. Also, if the support frame 10 is folded in a state in which the hinge member 18 is unfolded, the whole
25 length of the tricycle is reduced. Therefore, the folding or unfolding operation can be easily maneuvered and a very compact tricycle can be achieved.

Industrial Applicability

As described above, in the collapsible tricycle according to the present invention, both the width and length of the tricycle can be greatly reduced, compared to the
30 conventional tricycle, thereby attaining easy storage into a compact configuration. In particular, the tricycle according to the present invention can be stored in a luggage

compartment of an automobile in a folded state and can conveniently used just by unfolding at any time when necessary. Since two wheels are disposed at the forward portion of a support frame and one wheel is disposed at the rearward portion of the support frame, running safety while moving on a curved road as well as a straight road can be attained. Also, excellent braking stability can be secured and locking can be prevented during abrupt brake, by installing a brake system on each of the front wheels. Further, since the length of the support frame is reduced, rider's mounting or dismounting convenience can be enhanced. Also, the collapsible tricycle according to the present invention can be adjustably used with detachable rechargeable batteries to be electrically driven, so that it will surely attract considerable attention as pollution-free transportation means for the next generation.

What is claimed is:

1. A collapsible tricycle comprising:

a support frame which has a sleeve with a handle bar formed at its forward portion and a hinge member installed around its center so as to be folded in either side, and on
5 which a pair of laterally spaced front wheels and a rear wheel are disposed;

handle frames each having a handgrip provided at its upper part and an extension for supporting the front wheels, provided at its lower part;

a connection rod fitted into the sleeve of the support frame and having an absorbing means; and

10 upper and lower support plates, which are hinged with the handle frame and the connection rod, respectively, and are foldable upward, for supporting the connection rod.

2. The collapsible tricycle of claim 1, wherein each locking device for locking or unlocking the handle frames such that one side handle frame is latched to the other, is provided in the handle frames, so that a space between the front wheels is maintained
15 constantly in a state in which the upper and lower support plates are folded.

3. The collapsible tricycle of claim 1, wherein the handle frames are tilted at a predetermined angle in a rearward direction of a vertical center axis of the front wheels.

4. The collapsible tricycle of claim 2, wherein the handle frames are tilted at a predetermined angle in a rearward direction of a vertical center axis of the front wheels.

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FIG. 1

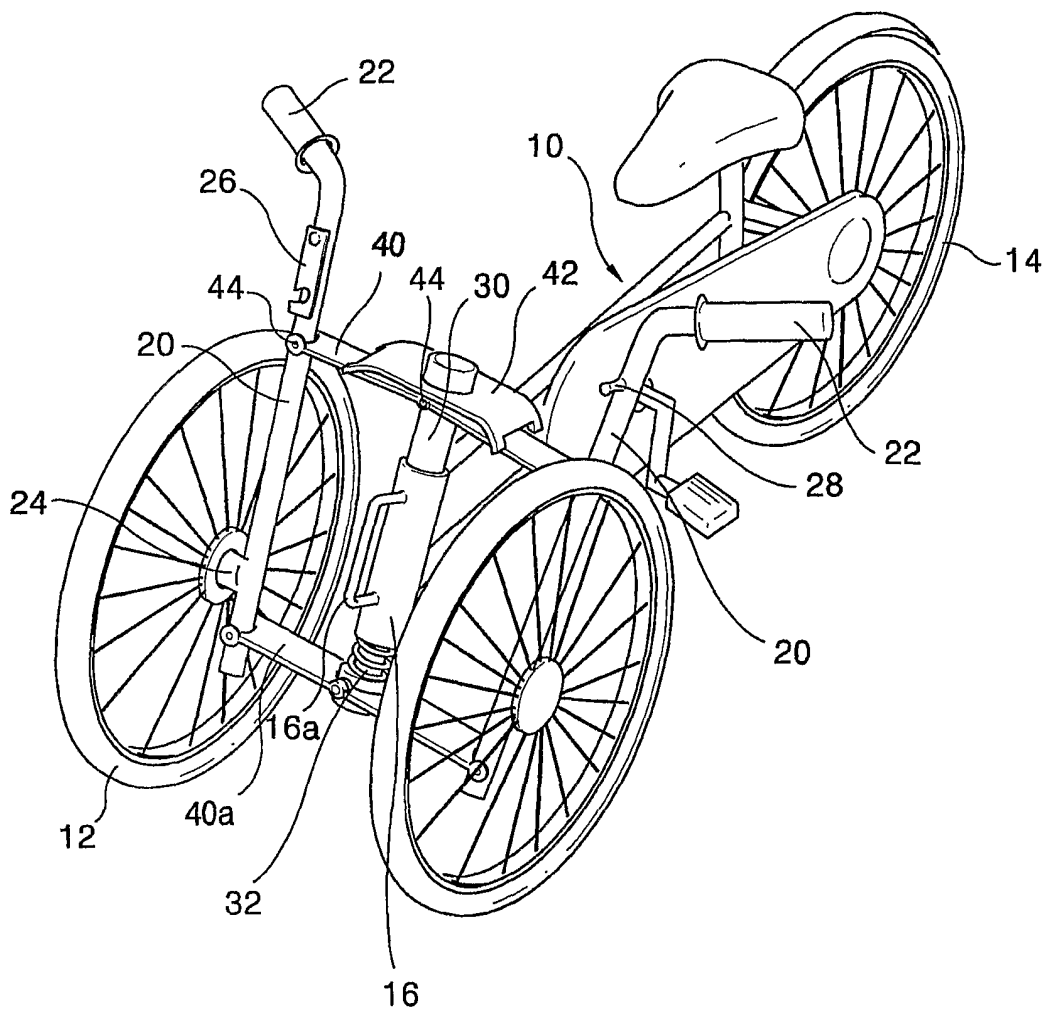


FIG. 2

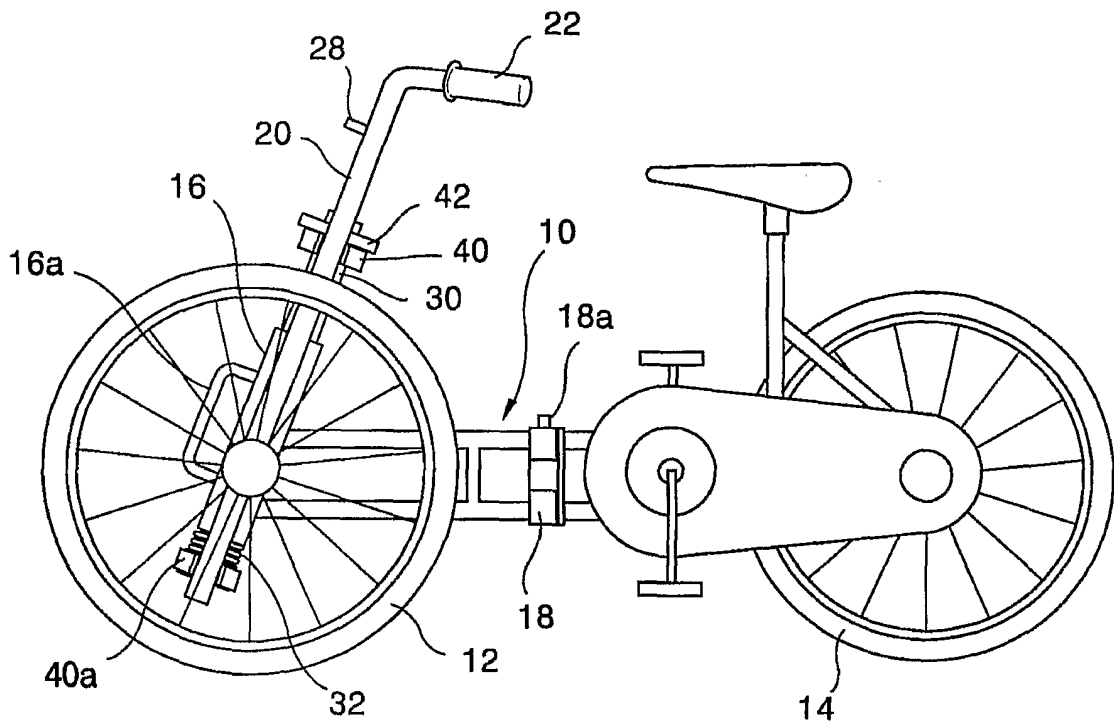


FIG. 3

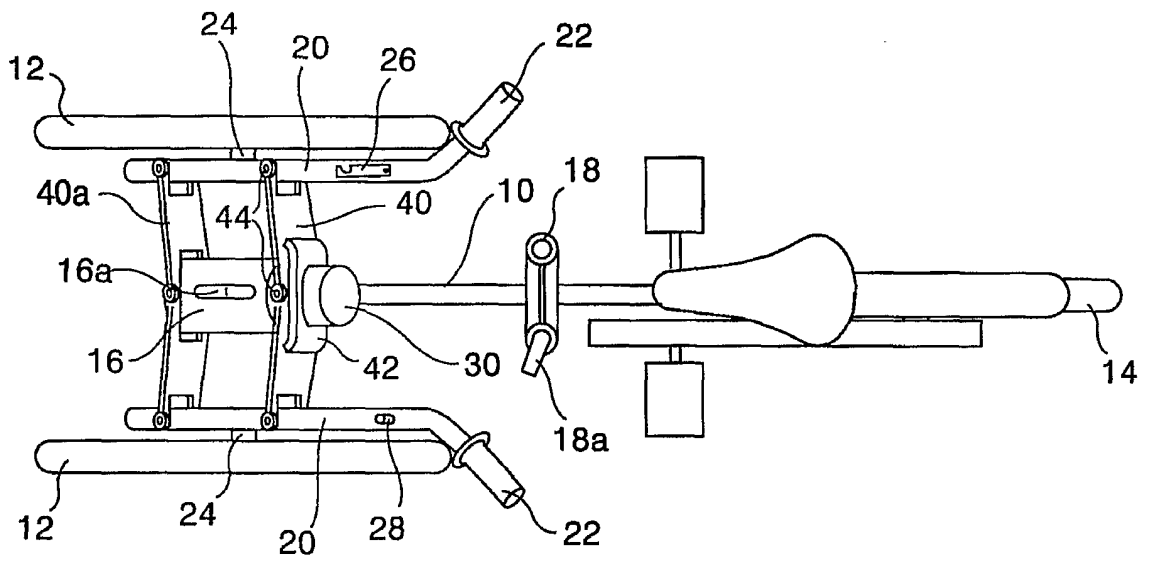


FIG. 4A

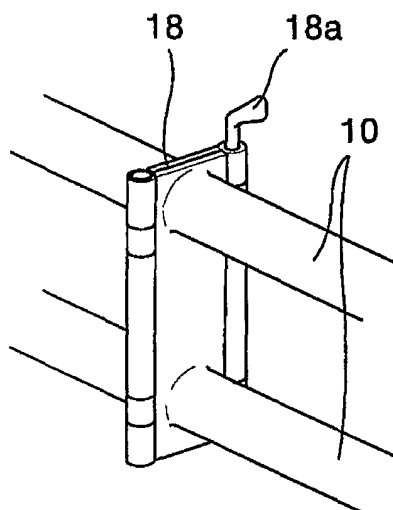


FIG. 4B

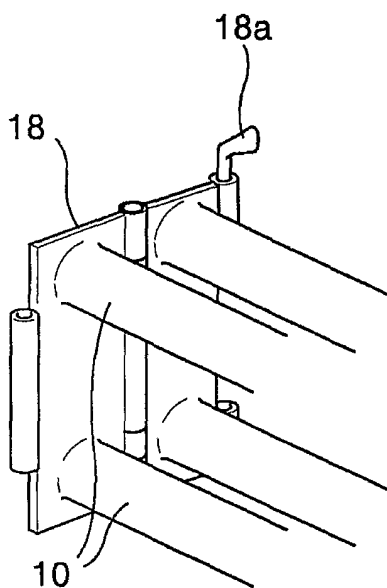


FIG. 5A

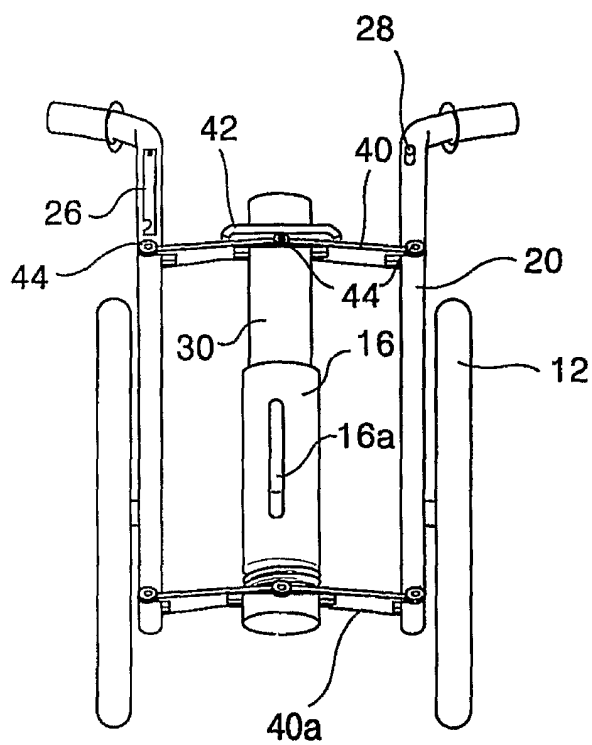


FIG. 5B

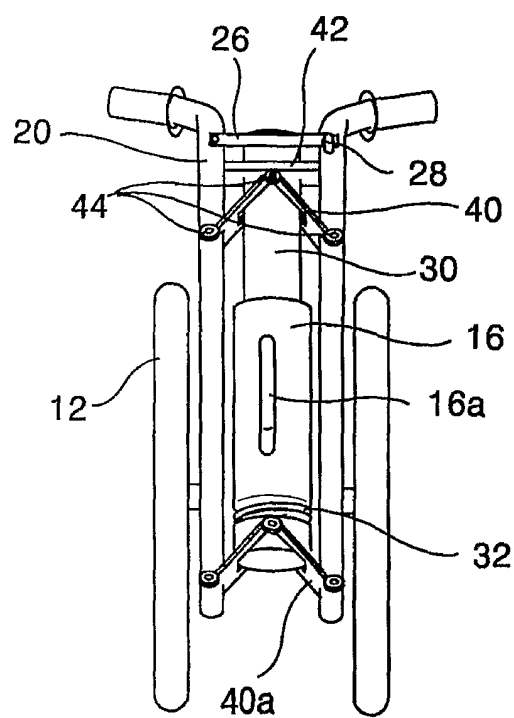


FIG. 6A

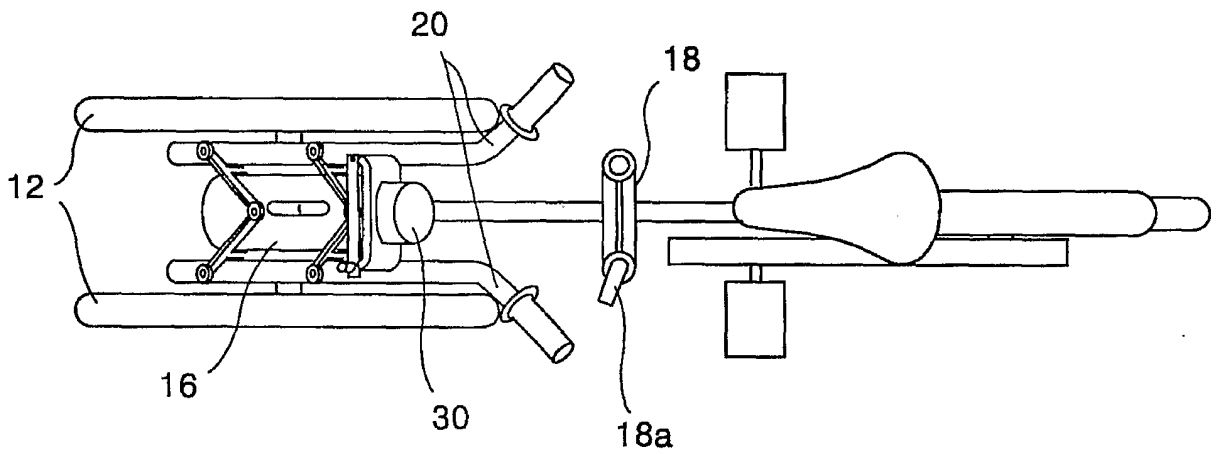
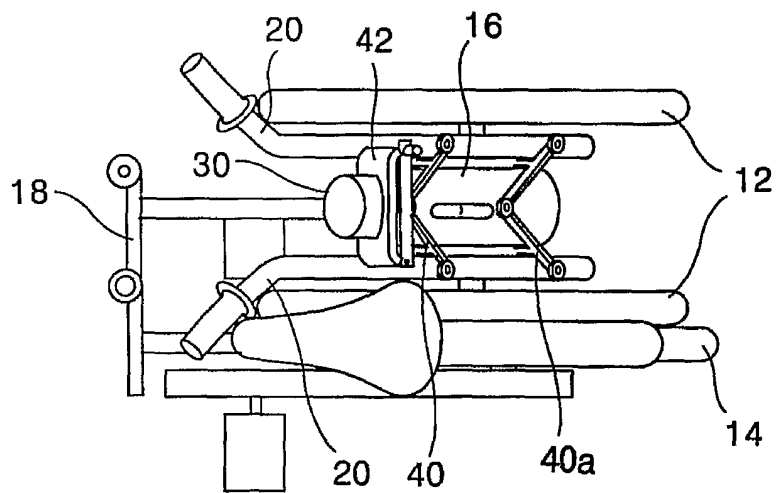


FIG. 6B



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR01/00417

A. CLASSIFICATION OF SUBJECT MATTER
IPC7 B62K 5/04
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC7 B62B, B62M, B62K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KR, JP, IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5145196 A (Dennis J. Langkamp) 8 SEPTEMBER 1992	1 - 4
A	US 6036220 A (Hui-Fen Zhen) 14 MARCH 2000	1 - 4
A	KR 85-2491 U (Song, Suck Goo) 22 MAY 1985	1 - 4
A	KR 84-5361 U (Jung, Choong Ho) 15 OCTOBER 1984	1 - 4

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search 15 JUNE 2001 (15.06.2001)	Date of mailing of the international search report 18 JUNE 2001 (18.06.2001)
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