

COMMONWEALTH of AUSTRALIA
PATENTS ACT 1952

593110

APPLICATION FOR A STANDARD PATENT

I ~~we~~ CHI HONG
of Faculty's Residence No. 5-7.
Wuhan Hydraulic/Electric Power Institute,
Wuhan,
PEOPLES' REPUBLIC OF CHINA

hereby apply for the grant of a Standard Patent for an invention entitled:

"A DISCO-CAR FOR EXERCISE AND RECREATION"

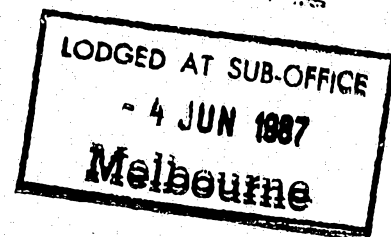
which is described in the accompanying ~~provisional~~-
complete specification.

Details of basic application(s):—

<u>Number</u>	<u>Convention Country</u>	<u>Date</u>
86210936 (Utility Model)	PEOPLES' REPUBLIC OF CHINA	30 December 1986

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED 17.11.89



The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 4th day of June 1987

To: THE COMMISSIONER OF PATENTS

H. M. Rimington
.....
(a member of the firm of DAVIES &
COLLISON for and on behalf of the Applicant).

Davies & Collison, Melbourne and Canberra.

COMMONWEALTH OF AUSTRALIA

Patents Act 1952

**DECLARATION IN SUPPORT
OF AN APPLICATION OR
A CONVENTION APPLICATION FOR A
PATENT OR PATENT OF ADDITION**

In support of the Application made by *Chi Hong*

for a patent/~~patent of addition~~ for an invention entitled:

A Disco Car For Exercise And Recreation
I,

Chi Hong
care of the applicant company do solemnly and sincerely declare as follows:

*^a(1) I am the applicant for the patent/~~patent of addition~~.

*^a(1) ~~I am authorised by the applicant for the patent/patent of addition to make this declaration on its behalf.~~

*^b(2) The basic application(s) as defined by section 141/~~142~~ of the Act was/~~were~~ made

in *China*

on *Dec. 30, 1986*

(*App. No. 86210936*)

in

on

in

on

by *Chi Hong*

*^a(3) I am the actual inventor of the invention.

*^a(3) *Chi Hong*

is/~~are~~ the actual inventor(s) of the invention and the facts upon which

~~is/are entitled to make the application are as follows.~~

*^b(4) The basic application(s) referred to in paragraph 2 of this Declaration is/~~are~~ the first application(s) made in a Convention country in respect of the invention the subject of the application.

Declared at *Wuhan* this *1st* day of *June* 1987.

To: The Commissioner of Patents,
Commonwealth of Australia.

Status *Technician*

也 洪 1987.6.1
CHI HONG
Wuhan Hydraulic & Electric
Patent Attorneys *Power Inst.*
Sydney.

*^a—Delete whichever is inapplicable.

*^b—Delete if not a Convention application.

No legislation is required.

(12) PATENT ABRIDGMENT (11) Document No. AU-B-73858/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 593110

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STEERABLE CART

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CHI HONG

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(56) Prior Art Documents
AU 25922/88 B62B 3/00 B62B 1/10
US 4076269
GB 1604404

(57) Claim

1. An apparatus for use in exercise and recreation whereby movement in a forward direction is produced by swinging or swaying of the player's body together with steering by hand comprising:

a frame with a board for loading of the player;

a front row of wheels having a front left wheel and a front right wheel, each of the wheels can pivot about a vertical shaft respectively, said vertical shafts being supported by said frame;

a front linking bar for enabling said front wheels to change their directions synchronously;

a rear row of wheels having a rear left wheel and a rear right wheel, each of the wheels can pivot about a vertical shaft, respectively, said vertical shafts being supported by said frame;

a rear linking bar for enabling said rear wheels to change their directions synchronously;

a connecting rod hinged at its one end with said front

linking bar and other end with said rear linking bar in such a manner that turning direction of the front row of wheels is opposite with the direction of said rear row of wheels; and

a direction control means for controlling the direction of the wheels, said direction control means further comprises two control levers pivotably mounted on said frame about pins, each of the lower ends of said levers is connected to one of said vertical shaft through a connecting bar.

2. An apparatus as defined in claim 1, wherein said two control levers are pivotably mounted for swinging in substantially forward and backward direction and are operatively coupled to swing in opposite direction to each other.

3. An apparatus for use in exercise and recreation whereby movement in a forward direction is produced by swinging or swaying of the player's body together with steering by hand comprising:

a frame with a board for loading of the player;

a front row of wheels having a front left wheel and a front right wheel, each of the wheels can pivot about a vertical shaft, respectively, said vertical shafts being supported by said frame;

a rear row of wheels having a rear left wheel and a rear right wheel, said wheels being mounted on said frame with the wheels only permitted to rotate freely about their own axes;

a direction control means for controlling the direction of said front row of wheels, said direction control means further comprises two control levers pivotably mounted on said frame about pins, each of the lower ends of the levers is connected to one of said vertical shaft through a connecting bar; a linking bar for enabling said front wheels to change their directions synchronously.

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(10) 593110

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5. An apparatus as defined in claim 4, wherein a rocking chair is mounted on said board through linking bars, two springs are utilised to restore the chair to its basic position so as said chair can only move transversely.

PATENT ACT 1952

COMPLETE SPECIFICATION

(Original)

FOR OFFICE USE

Class Int. Class

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

This document contains the
amendments made under
Section 49 and is correct for
printing.

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1 Little Collins Street, Melbourne, 3000.

Complete Specification for the invention entitled:

"A DISCO-CAR FOR EXERCISE AND RECREATION"

The following statement is a full description of this invention,
including the best method of performing it known to me :-

Background of the Invention

A) Field of the Invention

The present invention relates to an apparatus for exercise and recreation and more particularly to apparatus for both exercise and recreation, which moves forward by swinging or swaying of the player's body.

B) Description of Prior Art

The known apparatuses of this general type for both exercise and recreation are roller skates and roller boards. Although neither power nor special mechanism is needed in roller skating, it requires that the player's feet step on the ground in turn and requires player's good skill of balance, consequently it is not suitable to the old and handicapped people. As for roller board, it can only move forward by player's one foot stepping on the ground. Even though it can also move forward by swinging of the player's body, this sort of skill can only be mastered after a long period of training and practice, and it is still difficult to control the direction. This sort of roller board is generally played on a bowl-shaped surface with lip-diameter larger than six meters by making use of the principle of transformation

1 between kinetic and potential energy to make it move up and
2 down. Thus its application is quite limited.

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4 SUMMARY OF THE INVENTION

5 In accordance with the present invention there is provided
6 an apparatus for use in exercise and recreation whereby
7 movement in a forward direction is produced by swinging or
8 swaying of the player's body together with steering by hand
9 comprising:

10 a frame with a board for loading of the player;

11 a front row of wheels having a front left wheel and a
12 front right wheel, each of the wheels can pivot about a
13 vertical shaft respectively, said vertical shafts being
14 supported by said frame;

15 a front linking bar for enabling said front wheels to
16 change their directions synchronously;

17 a rear row of wheels having a rear left wheel and a
18 rear right wheel, each of the wheels can pivot about a
19 vertical shaft, respectively, said vertical shafts being
20 supported by said frame;

21 a rear linking bar for enabling said rear wheels to
22 change their directions synchronously;

23 a connecting rod hinged at its one end with said front
24 linking bar and other end with said rear linking bar in such
25 a manner that turning direction of the front row of wheels
26 is opposite with the direction of said rear row of wheels;
27 and

28 a direction control means for controlling the direction
29 of the wheels, said direction control means further
30 comprises two control levers pivotably mounted on said frame
31 about pins, each of the lower ends of said levers is
32 connected to one of said vertical shaft through a connecting
33 bar.

34 In accordance with the present invention there is also
35 provided an apparatus for use in exercise and recreation
36 whereby movement in a forward direction is produced by
37 swinging or swaying of the player's body together with

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1 steering by hand comprising:

2 a frame with a board for loading of the player;

3 a front row of wheels having a front left wheel and a
4 front right wheel, each of the wheels can pivot about a
5 vertical shaft, respectively, said vertical shafts being
6 supported by said frame;

7 a rear row of wheels having a rear left wheel and a
8 rear right wheel, said wheels being mounted on said frame
9 with the wheels only permitted to rotate freely about their
10 own axes;

11 a direction control means for controlling the direction
12 of said front row of wheels, said direction control means
13 further comprises two control levers pivotably mounted on
14 said frame about pins, each of the lower ends of the levers
15 is connected to one of said vertical shaft through a
16 connecting bar; a linking bar for enabling said front wheels
17 to change their directions synchronously.

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19 BRIEF DESCRIPTION OF DRAWINGS

20 Four preferred embodiments of the present invention
21 will now be described in detail, by way of example only,
22 according to the attached figures, in which:

23 Figure 1 is a configuration sketch of the first
24 embodiment of the present invention, where 1A is the side
25 view, 1B is the front view and 1C the top view;

26 Figure 2 is a cross section of the present invention
27 taken along line B-B in Figure 1;

28 Figure 3, a partial cross section taken along line C-C
29 in Figure 1, showing the structure of the front wheel;

30 Figure 4 is a partial cross section taken along-----

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line D-D in figure 1, showing the structure of a rear wheel;

Figure 5 is bottom view of the first embodiment of the present invention;

5 Figure 6 is a bottom view of the second embodiment of the present invention;

Figure 7 is a corss section taken along line E-E in figure 6, showing the structure of a rear wheel;

10 Figure 8 is a side view of the third embodiment of the present invention;

Figure 9 is a corss section taken along line A-A in figure 8, showing the structure of the rocking chair;

15 Figure 10 is a bottom view of the fourth embodiment of the present invention;

Figure 11 is a partial corss section taken along line F-F in figure 10.

Detailed Description of the Invention

20 Figures 1 to 5 show the first embodiment of the present invention.

A board 1 is make of plastic or metal sheet. Near the edges of the board, there are two concaves 6 which are for the player to stand on.

25 Direction-control mechanism comprises two control levers 4 and 5, pin 7, universal joints 8 and 10 and connecting bar 9 as shown in figure 2. Said control levers can swing about said pin 7, at the bottom end of said lever is mounted with a universal joint

8, which, in sequence, is connected with universal joint 10 through a connecting bar 9.

Wheel system comprises front wheels 2, rear wheels 3, bar 12, vertical shaft 11 of front wheel, support 13, semi-axle 14, bearing 15, frame 16, (refer to figure 3), bearing 17, rear semi-axle 18, rear frame 19, (refer to figure 4), bolt 21 and linking bar 22, (refer to figure 5).

Refer to figure 3, the vertical shaft 11 of front wheel is rotatably mounted on support 13 and connected with universal joint 10 of the direction-control mechanism by a bar 12, parallel to which is a semi-axle 14 welded to the vertical shaft 11 of front wheel. Said front wheel 2 is rotatably mounted on said semi-axle 14 through a bearing 15. Said support 13 is fixed on a frame 16 which is made of metal sheet or other material and formed by press. Frame 16 is the main load-bearing structure on which exercising board 1 is attached, said frame 16 and said exercising board 1 can also be formed integrally.

In figure 4, rear wheel 3 is rotatably mounted on a rear support 19 through a bearing 17 and a rear semi-axle 18. Rear support 19 is fixed on said frame 16.

Linking bar 20 in figure 5 is fixed on the bottom end of said vertical shaft 11 of said front wheel and swivels integrally with said shaft 11. Said linking bar 20 is substantially perpendicular to said bar 12 and said semi-axle 14. The component that enables the two front wheels to change their direction

synchronously is a connecting linking bar 22 which is hinged to linking bar 20 by bolt 21. The process of synchronously changing direction is as follows:

When standing on said board 1 with two feet
5 respectively in concaves 6 and two hands holding control levers 4 and 5, the player pulls any one of the two control levers backward, the swing of the bottom end of said control lever will cause connecting bar 9 to move forward via universal joint
10 8, and the universal joint at the other end of said connecting bar 9 will cause bar 12 to move also forward. This will make vertical shaft 11 of front wheel rotate in support 13, and semi-axle 14 on vertical axle 11 will rotate about said shaft 11 accordingly. Said
15 front wheel will turn about vertical shaft 11 and its direction will be changed. At the same time, linking bar 20 at the bottom end of said vertical shaft 11 will push linking 22 to move via bolt 21, and this
20 will cause the other front wheel to turn, resulting two front wheels to turn synchronously to the same direction. The other control lever in other hand will automatically move forward.

If at the moment when left control lever is
25 pulled backward and right control lever is pushed forward resulting the front wheels are about to turn left, the gravity center of the player's body swings also to the left, then a component force resulting from the inertial force of swinging of the player's body
30 will push said disco-car to move forward in the front wheel's turning direction, otherwise, if the player's

body swings to the right when the front wheels are turning left, the inertial force of swinging of the player's body will cause said disco-car to move backward. similarly, if the player's body swings to the right when the front wheels are turning right, the inertial force of swinging of the player's body will push said disco-car to move forward, otherwise, backward. When the player keeps doing these consecutively and harmoniously, said disco-car will gather speed to move forward. The movement of the player when operating said disco-car is very much like the basic movement of modern disco dance, this is why the apparatus of present invention is termed disco-car, operating this apparatus will be of benefit to the fitness of human waist and legs. Therefore it can best reach the aim for both entertainment and exercise.

Figure 6 and 7 show the second embodiment of the present invention.

This type of disco-car provided for two persons to play together. Although the first embodiment can also be operated by two persons, the second one is more attractive and interesting for the players. compared with the aforementioned embodiment, this one has a lengthened board, additional vertical shafts which enables rear wheels 3 to change their direction, and a linking structure connecting the direction control of the front and rear wheels as shown in figure 6. A long connecting rod 24 is hinged on said bar 12 of front wheel by bolt 23. The other end of said connecting rod 24 is hinged by bolt 25 on bar 28,

and the latter is structured integrally with wheel seat 27 of rear wheel. Two bars 28 of said rear wheels are connected by connecting bar 26 whose two ends are hinged on bars 28 by bolts 29 and 30. This makes
5 the two rear wheels change their direction synchronously.

If figure 7, a vertical shaft 31 of said rear wheel is rotatably mounted on frame 16 through a bearing 32 and a housing 33. Said vertical shaft 31 is welded to wheel seat 27 with which bar 28 is
10 structured integrally. The operation is as follows:

When front wheels 2 turn to certain direction under the operation of the control levers 4 and 5, the swivel of bar 12 causes rear wheel 3 to turn about said vertical shaft 31 by means of said long
15 connecting bar 24 and said bar 28 of the rear wheel. Said connecting bar 26 makes both rear wheels turn to the same direction. According to the above mentioned connection arrangement shown in figure 7, when front wheels turn left, rear wheels will turn right; when
20 front wheels turn right, rear wheels will turn left.

The operating method of this embodiment is as follows:

Two players stand on said board with one behind the other, the front one controls the moving direction
25 of said disco-car, while the back one holds the shoulders or the waist of his (or her) partner. If the front one swings his (or her) body to the left while makes said disco-car turn left, the back one must swing to the right, and vice versa.

30 Figures 8 and 9 show the third embodiment of the present invention. The player can sit on said

disco-car while operating it. The direction-control mechanism and wheel system are the same as in the first one. The only difference is that a rocking chair 34 is mounted on said board. To mount the chair, both ends of linking bars 35, 36, 37 and 38 are respectively hinged on shafts 39, 40 under the chair and shaft 41 and 42 on frame 16, shaft 39, 40, 41 and 42 are substantially parallel to the moving direction of said disco-car 16. Two springs 43 and 44 are utilized to restore the chair to its basic position. As the arrangement shows, chair 34 can only move transversely. The operating method is basically the same with the first embodiment. the difference is that, when the sitting player pulls backward the left control lever with his (or her) left hand, his (or her) body will tilt to the left by pulling force. The chair, therefore, will also tilt to the left, and vice versa. The gravity center of the player's body then swings. Based on the same principle of dynamics as described in the first embodiment, said disco-car will also gather its speed to move forward. This provides a safe and recreational apparatus for the old and handicapped people.

Figure 10 and 11 show the fourth embodiment of the present invention, in which one control lever 54 is utilized to control the direction of the front wheels 53. Adjacent the rear end of the board 45 is the fixed rear frame 46 on which a fixed axle 47 with two rear wheels 48 is mounted. At the front of said board 45, a front axle 52 with front wheels 53 is mounted in a front frame 50 which, in

turn is rotatably mounted in a bearing housing 49 through a vertical shaft 51, thus said front wheels 53 not only can rotate freely about front axle 52, but also can swivel in said bearing housing 49 about said shaft 51 to change their direction. The turning of said front frame 50 is operated by said control lever 54 through swivel arm 55 and linking bar 56. Spring 57 is used for restoring said front frame 50 to its initial position. Its one end is fixed on the body of said disco-car, another end is connected with said front frame 50. Figure 11 also shows the way of standing on said board 45.

The operating method for this embodiment is as follows:

Player should stand on the board in the way as shown in figure 11, i.e. with his (or her) two feet at the front and rear side of said board 45, respectively. Preferably, the gravity center of his (or her) body fall on the position near his (or her) foot at the rear side, holding control lever 54 with one hand and swaying his (or her) body clockwise and counter-clockwise about his (or her) body's vertical axis. That is, when swaying clockwise, the player rotates said control lever 54 clockwise, and vice versa.

To sum up, the present invention provides an apparatus for both exercise and recreation. No special requirement is needed for the playground. Thus, it has a wide range of application. Since the player's waist and legs must continuously swing or sway, so

do the hands, the present invention of disco-car
therefore can reach the aim for both exercise and
recreation. The fourth embodiment of the present
invention requires not only better sport technique
5 but also certain physical strength. It is more attractive
to young people.

It should be noted that the present invention
can be further improved, such as the length of the
control lever can be adjusted in accordance with
10 the individual player, a brake device may be equipped,
and only one front wheel may be equipped, etc. These
improvements all belong to the present invention.

1 THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

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3 1. An apparatus for use in exercise and recreation whereby
4 movement in a forward direction is produced by swinging or
5 swaying of the player's body together with steering by hand
6 comprising:

7 a frame with a board for loading of the player;

8 a front row of wheels having a front left wheel and a
9 front right wheel, each of the wheels can pivot about a
10 vertical shaft respectively, said vertical shafts being
11 supported by said frame;

12 a front linking bar for enabling said front wheels to
13 change their directions synchronously;

14 a rear row of wheels having a rear left wheel and a
15 rear right wheel, each of the wheels can pivot about a
16 vertical shaft, respectively, said vertical shafts being
17 supported by said frame;

18 a rear linking bar for enabling said rear wheels to
19 change their directions synchronously;

20 a connecting rod hinged at its one end with said front
21 linking bar and other end with said rear linking bar in such
22 a manner that turning direction of the front row of wheels
23 is opposite with the direction of said rear row of wheels;
24 and

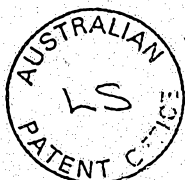
25 a direction control means for controlling the direction
26 of the wheels, said direction control means further
27 comprises two control levers pivotably mounted on said frame
28 about pins, each of the lower ends of said levers is
29 connected to one of said vertical shaft through a connecting
30 bar.

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32 2. An apparatus as defined in claim 1, wherein said two
33 control levers are pivotably mounted for swinging in
34 substantially forward and backward direction and are
35 operatively coupled to swing in opposite direction to each
36 other.

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1 3. An apparatus for use in exercise and recreation whereby
2 movement in a forward direction is produced by swinging or
3 swaying of the player's body together with steering by hand
4 comprising:

5 a frame with a board for loading of the player;

6 a front row of wheels having a front left wheel and a
7 front right wheel, each of the wheels can pivot about a
8 vertical shaft, respectively, said vertical shafts being
9 supported by said frame;

10 a rear row of wheels having a rear left wheel and a
11 rear right wheel, said wheels being mounted on said frame
12 with the wheels only permitted to rotate freely about their
13 own axes;

14 a direction control means for controlling the direction
15 of said front row of wheels, said direction control means
16 further comprises two control levers pivotably mounted on
17 said frame about pins, each of the lower ends of the levers
18 is connected to one of said vertical shaft through a
19 connecting bar; a linking bar for enabling said front wheels
20 to change their directions synchronously.

21
22 4. An apparatus as defined in claim 3, wherein said two
23 control levers are pivotably mounted for swinging in
24 substantially forward and backward direction and are
25 operatively coupled to swing in opposite direction to each
26 other.

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28 5. An apparatus as defined in claim 4, wherein a rocking
29 chair is mounted on said board through linking bars, two
30 springs are utilised to restore the chair to its basic
31 position so as said chair can only move transversely.

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1 6. An apparatus for both exercise and recreation,
2 substantially as hereinbefore described with reference to
3 the drawings.

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9 DATED this 10th day of November, 1989.

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11 CHI HONG

12 By his Patent Attorneys

13 DAVIES & COLLISON

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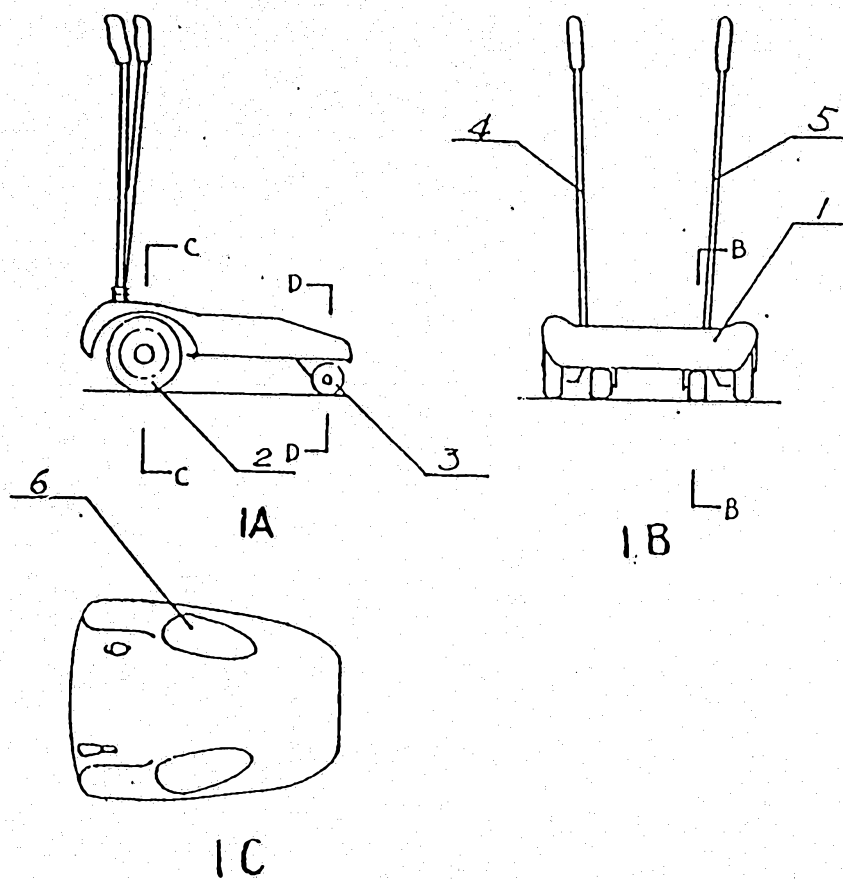


FIG. 1

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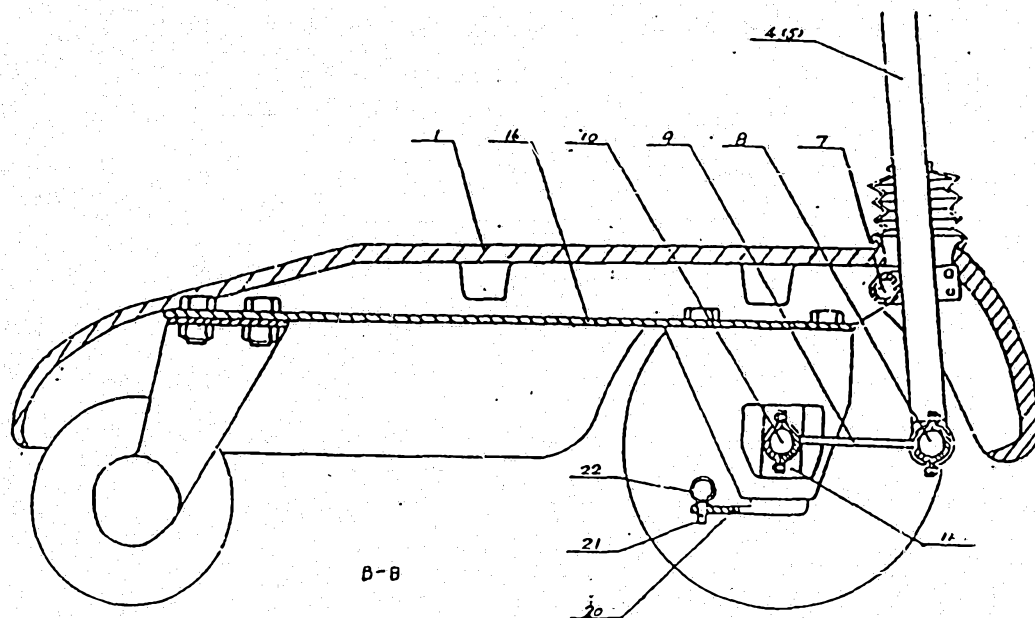


FIG. 2

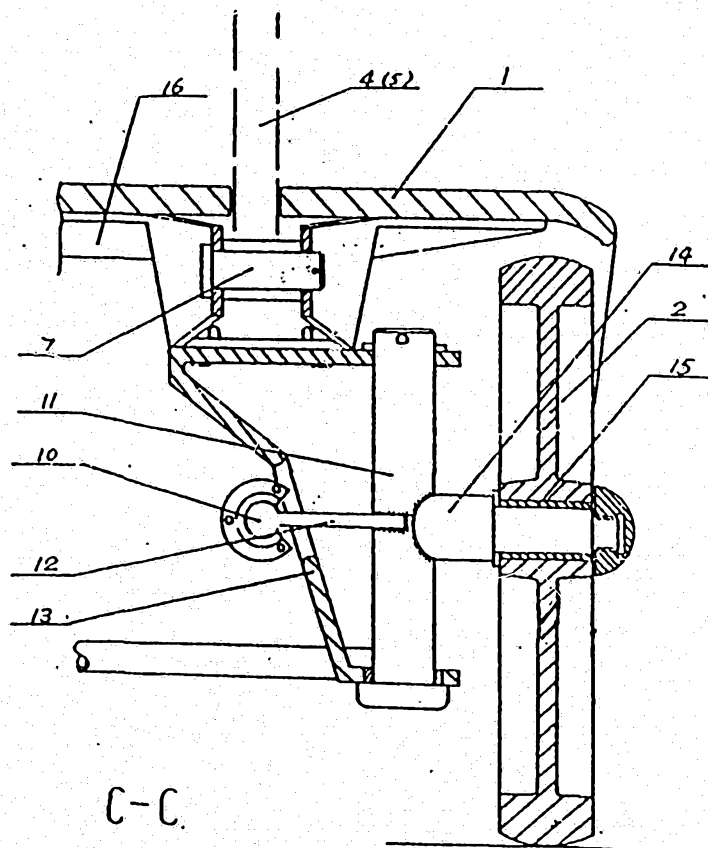


FIG. 3

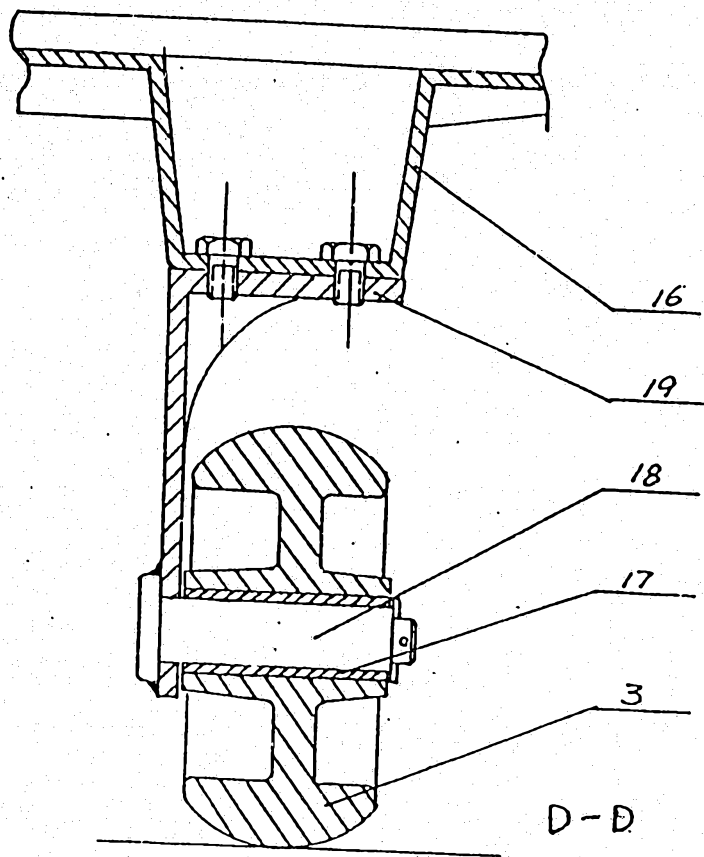


FIG. 4

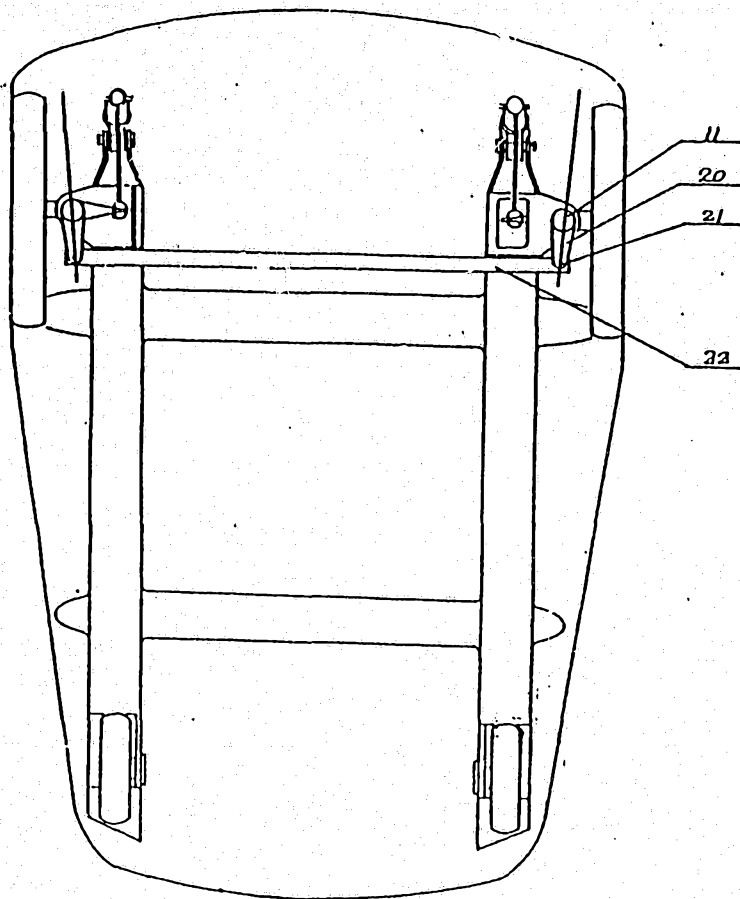


FIG. 5

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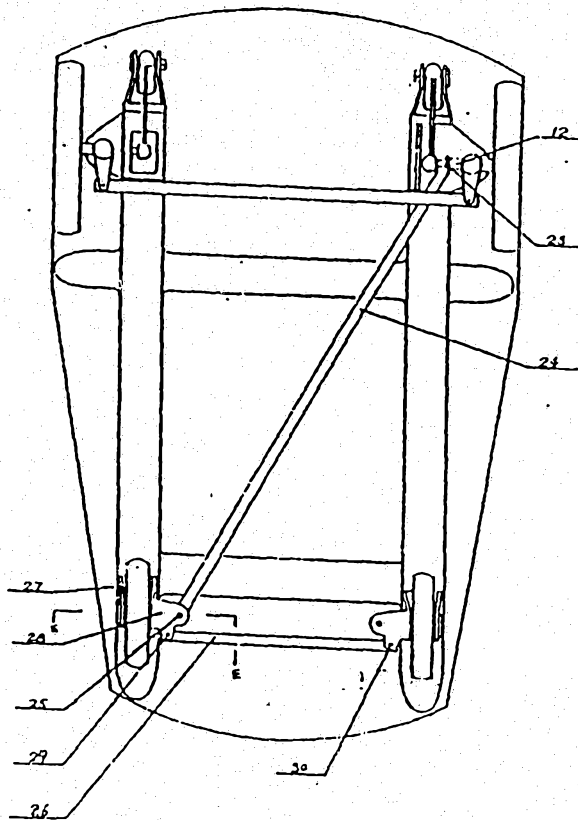


FIG. 6

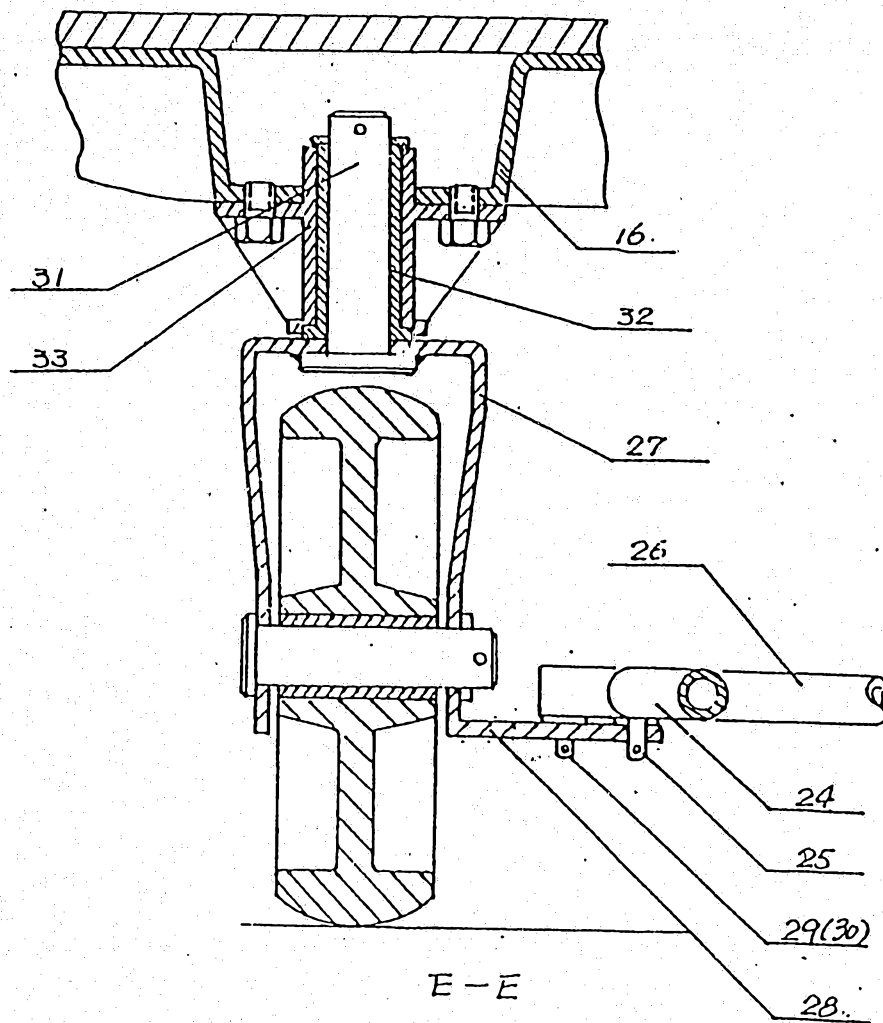


FIG. 7

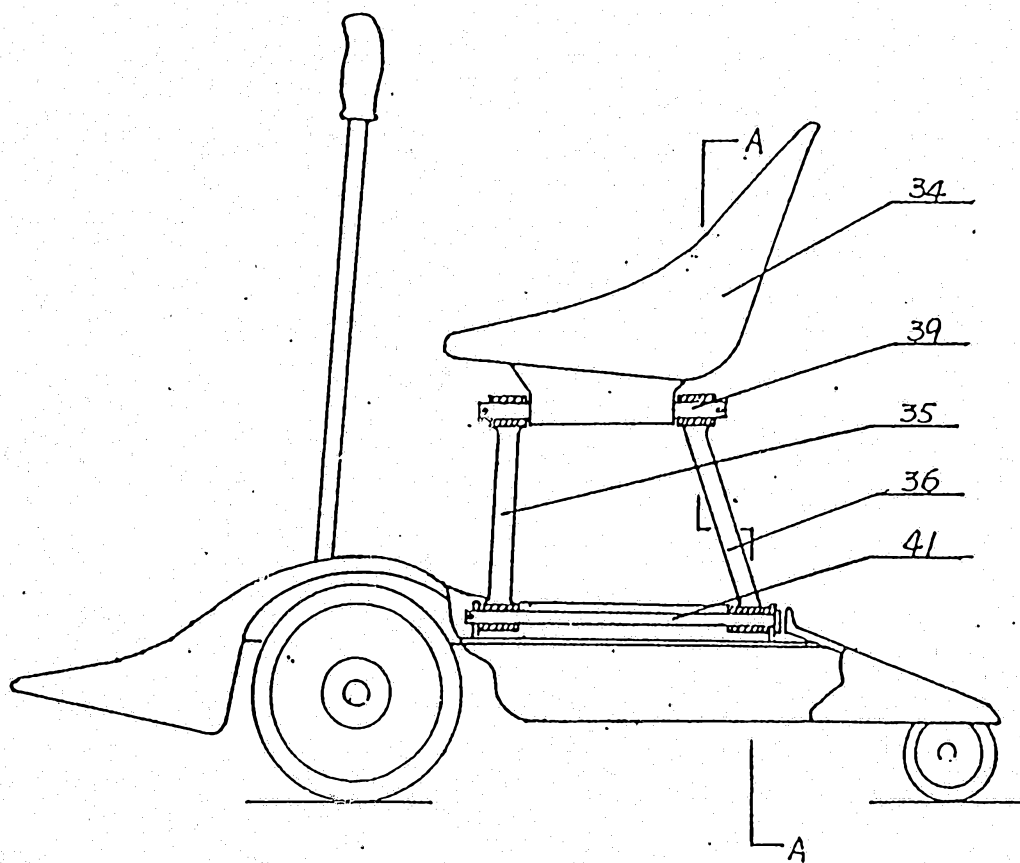
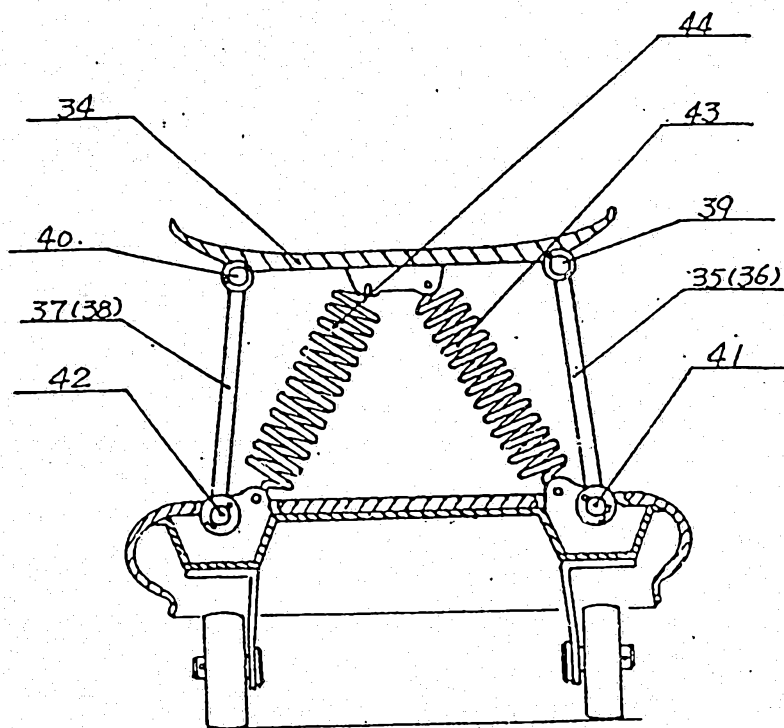


FIG. 8



A-A

FIG. 9

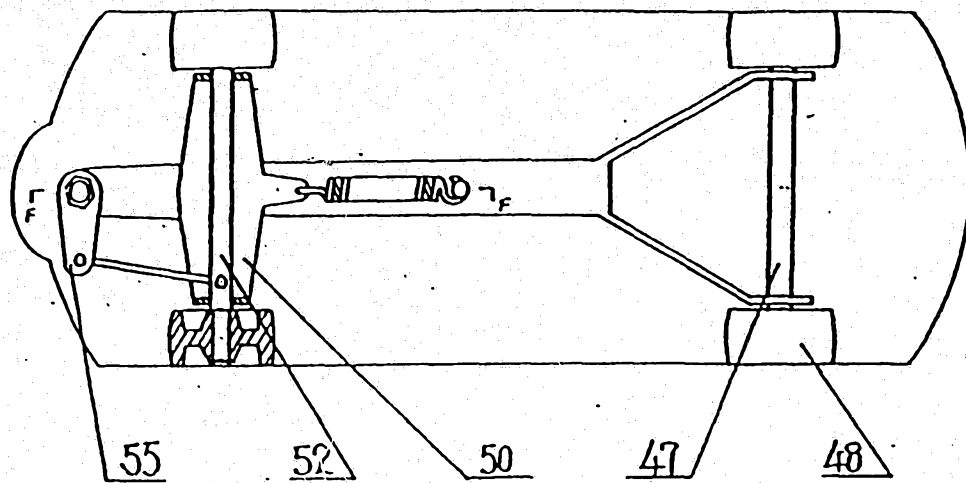


FIG. 10

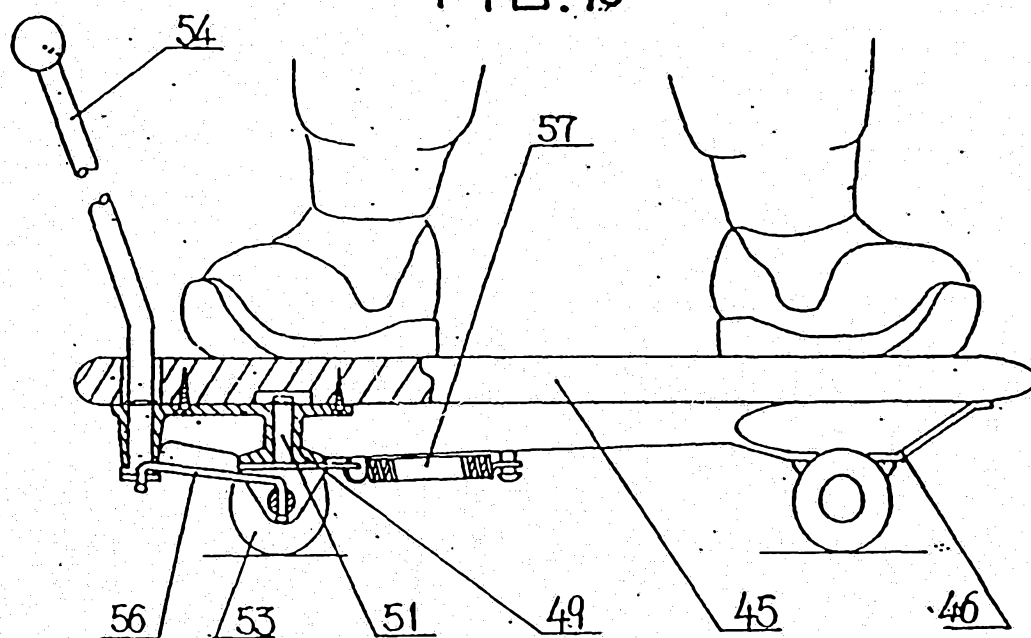


FIG. 11