

LOCKABLE OR RELEASABLE BICYCLE WITH BIDIRECTIONAL INPUT AND ONE-WAY OUTPUT

BACKGROUND OF THE INVENTION

5 (a) Field of the Invention

The lockable or releasable bicycle with bidirectional input and one-way output of the present invention drives the input terminal of the human input device at forward or reverse dual rotary direction through human's foot, and then the output terminal of the human input device
10 transmits the kinetic energy to the input terminal of the lockable or releasable transmission with bidirectional input and one-way output, and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output produces constant rotary direction output to drive the load wheel group; and when the load wheel group
15 moves back, the reverse drive caused by back move occurs at output terminal, through releasing the lockable or releasable mechanism, the lockable or releasable bicycle with bidirectional input and one-way output is prevented from locking.

The present invention is applied to pedal vehicle, or mixture of
20 electric and pedal vehicles, or combination of electric and pedal vehicles, especially to a bicycle pedaling at bidirection and one-way moving driven.

(b) Description of the Prior Art

The rider on the conventional bicycle always pedals at constant direction, and the related muscles and joints are constantly used during the
25 pedaling period, i.e. some muscles and joints of the rider's body are constantly used and stressed, and the others are constantly unused and released, overall, the human load is uneven, the rider is easily fatigued, and exercise injury is caused by frequently pedaling.

SUMMARY OF THE INVENTION

The lockable or releasable bicycle with bidirectional input and one-way output of the present invention is a human input device with dual rotary direction input, in which the output terminal thereof connects to the input terminal of a lockable or releasable transmission with bidirectional input and one-way output, the constant rotary direction output through the output terminal of the lockable or releasable transmission with bidirectional input and one-way output to drive a load wheel group; the rider chooses the direction of driving input, and makes constant rotary direction output with same or different speed ratio at different driven input direction to drive the load wheel group, and when the load wheel group moves backwards, i.e. reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism, the lockable or releasable bicycle with bidirectional input and one-way output is prevented from locking.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view showing the basic component blocks of the lockable or releasable bicycle with bidirectional input and one-way output, according to the present invention.

Fig. 2 is a schematic view showing the driving device component blocks, in which a bugtriebwerk 12 is additionally installed between a human input device 11 and a lockable or releasable transmission with bidirectional input and one-way output 13 in Fig. 1.

Fig. 3 is a schematic view showing the driving device component blocks, in which a posterior transmission 14 is additionally installed between the lockable or releasable transmission with bidirectional input and one-way output 13 and a load wheel group 15 in Fig. 1.

Fig. 4 is a schematic view showing the driving device component blocks, in which the bugtriebwerk 12 is additionally installed between the

human input device 11 and the lockable or releasable transmission with
bidirectional input and one-way output 13, and the posterior transmission
14 is additionally installed between the lockable or releasable
transmission with bidirectional input and one-way output 13 and the load
5 wheel group 15 in Fig. 1.

Fig. 5 is a schematic view showing the structural unit of the lockable
or releasable transmission with bidirectional input and one-way output 13
installed in the lockable or releasable bicycle with bidirectional input and
one-way output.

10 Fig. 6 is a schematic structural view showing the first embodiment of
the lockable or releasable transmission with bidirectional input and
one-way output 13.

Fig. 7 is a schematic structural view showing the second embodiment
of the lockable or releasable transmission with bidirectional input and
15 one-way output 13.

Fig. 8 is a schematic structural view showing the third embodiment
of the lockable or releasable transmission with bidirectional input and
one-way output 13.

Fig. 9 is a schematic structural view showing the fourth embodiment
20 of the lockable or releasable transmission with bidirectional input and
one-way output 13.

Fig. 10 is a schematic structural view showing the fifth embodiment
of the lockable or releasable transmission with bidirectional input and
one-way output 13.

25 Fig. 11 is a schematic structural view showing the 6th embodiment of
the lockable or releasable transmission with bidirectional input and
one-way output 13.

DESCRIPTION OF MAIN COMPONENT SYMBOLS

30 11 : Human input device

- 12 : Bugtriebwerk
- 13 : Lockable or releasable transmission with bidirectional input and one-way output
- 14 : Posterior transmission
- 5 15 : Load wheel group
- 90 : Lockable or releasable mechanism
- 102 : Sun wheel
- 103 : Planetary wheel
- 104 : Outer wheel
- 10 200 : Planetary wheel support arm ring frame
- 201 : Planetary wheel shaft
- 301, 302, 303, 305 : One-way transmission
- 400 : Epicyclic gear support arm ring frame
- 401 : Epicyclic gear shaft
- 15 402 : Inward oblique wheel
- 403 : Epicyclic gear
- 404 : Outward oblique wheel
- 500 : Shell of gear train
- 600 : Machine body
- 20 602 、 603 、 605 、 606 、 615 、 616 、 617 : Driving wheel
- 604 、 618 : Revolving shaft
- 607 : Driving belt
- 2000 : Input shaft
- 3000 : Output shaft
- 25

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The lockable or releasable bicycle with bidirectional input and one-way output of the present invention drives the input terminal of the human input device at forward or reverse dual rotary direction through human's foot, and then the output terminal of the human input device

transmits the kinetic energy to the input terminal of the lockable or
releasable transmission with bidirectional input and one-way output, and
the output terminal of the lockable or releasable transmission with
bidirectional input and one-way output produces constant rotary direction
5 output to drive the load wheel group, and further to drive the vehicle
integrated at the load wheel group; the present invention is applied to
pedal vehicles, or mixture of electric and pedal vehicles, or combination
of electric and pedal vehicles, especially to a bicycle pedaling at
bidirection and one-way moving driven, for human's lower limbs pedaling
10 at bidirection to extend and change the muscle groups, thus achieving the
following advantages:

(1) reducing the injured caused by some muscles and joints overused;
and

(2) employing or training the unused muscles and joints.

15 The present invention relates to a human input device with dual
rotary direction input, in which the output terminal of the device is used to
transmit the kinetic energy to the input terminal of the specific lockable or
releasable transmission with bidirectional input and one-way output, and
the output terminal of the lockable or releasable transmission with
20 bidirectional input and one-way output produces constant rotary direction
output to drive the load wheel group, and further to drive the vehicle
integrated at the load wheel group; the rider selects the direction of
pedal-driven input, and the lockable or releasable transmission with
bidirectional input and one-way output with same or different speed ratio
25 produces constant rotary direction output at different driven input
direction; and when the load wheel group moves back, the reverse drive
caused by back move occurs at output terminal, through releasing the
lockable or releasable mechanism, the lockable or releasable bicycle with
bidirectional input and one-way output is prevented from locking.

30 Fig. 1 is a schematic view showing the basic component blocks of the

lockable or releasable bicycle with bidirectional input and one-way output, according to the present invention.

As shown in Fig. 1, which is a structural schematic view of the lockable or releasable bicycle with bidirectional input and one-way output, except for the components of the pedal vehicle and a machine body 600, the main components include:

-- human input device 11: constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which

-- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device 11;

-- the first driving rotary direction and the second driving rotary direction are reverse;

-- lockable or releasable transmission with bidirectional input and one-way output 13: which is driven by different rotary direction kinetic energy from the human input device 11, and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism 90, when reverse drive caused by back move occurs at the output terminal; in which

the transmission components within the lockable or releasable transmission with bidirectional input and one-way output 13 are constituted by one or more of the followings integrated with the lockable or releasable mechanism 90, including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and

pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output 13 is driven through being input the first driving
5 rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the
10 lockable or releasable transmission with bidirectional input and one-way output 13 are as following:

-- the first rotary direction and the second rotary direction are reverse;

-- if the input terminal is driven by the first rotary direction, the first
15 rotary direction output is produced through the first gear train driving the output terminal;

-- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

20 -- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

-- an one-way transmission is installed between the second gear train
25 and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

-- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with
30 bidirectional input and one-way output 13, the radial or axial lockable or

releasable mechanism 90 is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism 90, the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force; and

-- load wheel group 15: directly driven by the output terminal of the lockable or releasable transmission with bidirectional input and one-way output 13, and further driving a vehicle integrated with the load wheel group 15; in which

for the lockable or releasable bicycle with bidirectional input and one-way output, if it is driven through the human input device 11 by human's foot at the first driving rotary direction, or at the second rotary direction with different rotary direction from the first driving rotary direction, the kinetic energy output from the output terminal of the human input device 11 is transmitted to the input terminal of the lockable or releasable transmission with bidirectional input and one-way output 13 via the additionally installed bugtriebwerk 12, and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output 13 outputs kinetic energy with constant rotary direction, to drive the load wheel group 15, and to further drive a vehicle integrated with the load wheel group 15.

Fig. 2 is a schematic view showing the driving device component blocks, in which the bugtriebwerk 12 is additionally installed between the human input device 11 and the lockable or releasable transmission with

bidirectional input and one-way output 13 in Fig. 1.

As shown in Fig. 2, which is a structural schematic view of the lockable or releasable bicycle with bidirectional input and one-way output, except for the components of the pedal vehicle and a machine body 600,

5 the main components include:

-- human input device 11: constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group
10 with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which

-- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from
15 human's foot driving the input terminal of the human input device 11;

-- the first driving rotary direction and the second driving rotary direction are reverse;

-- bugtriebwerk 12: constituted by one or more of the following transmissions including various rotary transmission functional structures,
20 such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio; in which

the bugtriebwerk 12 is driven by the human input device 11 and outputs rotary kinetic energy for driving the lockable or releasable transmission with bidirectional input and one-way output 13;

25 -- lockable or releasable transmission with bidirectional input and one-way output 13: which is driven by different rotary direction kinetic energy from the bugtriebwerk 12, and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing
30 the lockable or releasable mechanism 90, when reverse drive caused by

back move occurs at the output terminal; in which

the transmission components within the lockable or releasable transmission with bidirectional input and one-way output 13 are constituted by one or more of the followings integrated with the lockable
5 or releasable mechanism 90, including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input
10 and one-way output 13 is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

15 the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output 13 are as following:

-- the first rotary direction and the second rotary direction are reverse;

20 -- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

-- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train
25 driving the output terminal;

-- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

30 -- an one-way transmission is installed between the second gear train

and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

-- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output 13, the radial or axial lockable or releasable mechanism 90 is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism 90, the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force; and

-- load wheel group 15: directly driven by the output terminal of the lockable or releasable transmission with bidirectional input and one-way output 13, and further driving a vehicle integrated with the load wheel group 15; in which

for the lockable or releasable bicycle with bidirectional input and one-way output, the kinetic energy output from the output terminal of the human input device 11, which is forward or reversely driven by human's foot, is transmitted to the lockable or releasable transmission with bidirectional input and one-way output 13, and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output 13 outputs kinetic energy with constant rotary direction, to drive the load wheel group 15 via the additionally installed posterior transmission 14, and to further drive a vehicle integrated with the load

wheel group 15.

Fig. 3 is a schematic view showing the driving device component blocks, in which a posterior transmission 14 is additionally installed
5 between the lockable or releasable transmission with bidirectional input and one-way output 13 and a load wheel group 15 in Fig. 1.

As shown in Fig. 3, which is a structural schematic view of the lockable or releasable bicycle with bidirectional input and one-way output, except for the components of the pedal vehicle and a machine body 600,
10 the main components include:

-- human input device 11: constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group
15 with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which

-- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from
20 human's foot driving the input terminal of the human input device 11;

-- the first driving rotary direction and the second driving rotary direction are reverse;

-- lockable or releasable transmission with bidirectional input and one-way output 13: which is driven by different rotary direction kinetic
25 energy from the human input device 11 through the bugtriebwerk 12, and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism 90, when reverse drive caused by back move occurs at the
30 output terminal; in which

the transmission components within the lockable or releasable transmission with bidirectional input and one-way output 13 are constituted by one or more of the followings integrated with the lockable or releasable mechanism 90, including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output 13 is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output 13 are as following:

- the first rotary direction and the second rotary direction are reverse;

- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train

when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

-- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with
5 bidirectional input and one-way output 13, the radial or axial lockable or releasable mechanism 90 is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input
10 and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism 90, the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism 90: related to a mechanism
15 driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- posterior transmission 14: constituted by one or more of the following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant
20 speed ratio or variable speed ratio, for being driving by the lockable or releasable transmission with bidirectional input and one-way output 13, and the output terminal is used to drive the load wheel group 15; and

-- load wheel group 15: directly driven by the output terminal of the posterior transmission 14, and further driving a vehicle integrated with the
25 load wheel group 15; in which

for the lockable or releasable bicycle with bidirectional input and one-way output, which drives the human input device 11 through forward or reverse rotation by human's foot, the output terminal outputs rotary kinetic energy transmitted to the input terminal of the lockable or
30 releasable transmission with bidirectional input and one-way output 13

through the additionally installed bugtriebwerk 12, and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output 13 outputs constant rotary direction output, to drive the load wheel group 15 through the additionally installed posterior transmission 14, and to further drive a vehicle integrated with the load wheel group 15.

Fig. 4 is a schematic view showing the driving device component blocks, in which the bugtriebwerk 12 is additionally installed between the human input device 11 and the lockable or releasable transmission with bidirectional input and one-way output 13, and the posterior transmission 14 is additionally installed between the lockable or releasable transmission with bidirectional input and one-way output 13 and the load wheel group 15 in Fig. 1.

As shown in Fig. 4, which is a structural schematic view of the lockable or releasable bicycle with bidirectional input and one-way output, except for the components of the pedal vehicle and a machine body 600, the main components include:

- human input device 11: constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which

- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device 11;

- the first driving rotary direction and the second driving rotary direction are reverse;

- bugtriebwerk 12: constituted by one or more of the following

transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio; in which

the bugtriebwerk 12 is driven by the human input device 11 and
5 outputs rotary kinetic energy for driving the lockable or releasable transmission with bidirectional input and one-way output 13;

-- lockable or releasable transmission with bidirectional input and one-way output 13: which is driven by different rotary direction kinetic energy from the bugtriebwerk 12, and outputs constant rotary direction
10 kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism 90, when reverse drive caused by back move occurs at the output terminal; in which

the transmission components within the lockable or releasable
15 transmission with bidirectional input and one-way output 13 are constituted by one or more of the followings integrated with the lockable or releasable mechanism 90, including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6)
20 fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output 13 is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and
25 the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output 13 are as following:

30 -- the first rotary direction and the second rotary direction are

reverse;

-- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

5 -- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

10 -- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

15 -- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

20 -- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output 13, the radial or axial lockable or releasable mechanism 90 is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism 90, the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

25 -- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

30 -- posterior transmission 14: constituted by one or more of the

following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio, for being driving by the lockable or releasable transmission with bidirectional input and one-way output 13,
5 and the output terminal is used to drive the load wheel group 15; and

-- load wheel group 15: directly driven by the output terminal of the posterior transmission 14, and further driving a vehicle integrated with the load wheel group 15.

For the lockable or releasable bicycle with bidirectional input and
10 one-way output, not only the related components and machine body of the vehicle driven and the load wheel group are installed, but also the characterized in that is the function of locking or releasing the bidirection input and one-way output, and the components and operational features of the lockable or releasable transmission with bidirectional input and
15 one-way output 13 are provided for describing the feasibility.

Fig. 5 is a structural unit schematic view, showing the installed lockable or releasable transmission with bidirectional input and one-way output 13 in the lockable or releasable bicycle with bidirectional input and one-way output, whose operational features are as following:

20 -- the first rotary direction and the second rotary direction are reverse;

-- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

25 -- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

-- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear
30 train when the first gear train is used to be the first rotary direction input

and produces the first rotary direction output;

-- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input
5 and produces the first rotary direction output;

-- by way of being installed the lockable or releasable mechanism 90 between the rotatable shell of the gear train and the machine body, or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output, when the output terminal of the
10 gear train with bidirectional input and one-way output drives the input terminal at reverse rotary direction, through releasing the lockable or releasable mechanism 90, the gear train is prevented from rigid lock status.

In the lockable or releasable bicycle with bidirectional input and
15 one-way output, the embodiments of the lockable or releasable transmission with bidirectional input and one-way output 13 used are shown as Figs. 6 to 11, including:

A) as shown in Figs. 6 to 7, this is constituted by a planetary gear train;

20 B) as shown in Figs. 8 to 9, this is constituted by an epicyclic gear train; and

C) as shown in Figs. 10 to 11, this is integrated constituted by a transmission with different transmission rotary direction.

Fig. 6 is a schematic structural view showing the first embodiment of
25 the lockable or releasable transmission with bidirectional input and one-way output 13.

As shown in Fig. 6, the lockable or releasable transmission with bidirectional input and one-way output 13 is constituted by a planetary gear train, and the input shaft and the output shaft are coaxial fitting, the
30 main components including:

-- one end of an input shaft 2000 through installed at one side of a shell 500 of the gear train via bearing structure, another end of the input shaft 2000 through an output shaft 3000 via an one-way transmission 302, and a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

-- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body 600: relatively static organization structure;

-- input shaft 2000 integrated at sun wheel 102;

-- a planetary wheel 103 installed between the outer wheel 104 and the sun wheel 102; the center of the planetary wheel 103 rotating at a planetary wheel shaft 201, and one end of the planetary wheel shaft 201 fixed at the shell 500 of the gear train;

-- the lockable or releasable mechanism 90 installed between the shell 500 of the gear train and the machine body 600;

-- A one-way transmission 301 installed between ring structure of the outer wheel 104 and the output shaft 3000;

-- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 302 for driving the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the sun wheel 102 for further driving the planetary wheel 103 and the outer wheel 104, and through the ring structure of the outer wheel 104 and the one-way transmission 301, for

driving the output shaft 3000 to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft 3000, through releasing the lockable or releasable mechanism 90, idling
5 produced between the shell 500 of the gear train and the machine body 600, the first gear train and the second gear train are prevented from lock status.

Fig. 7 is a schematic structural view showing the second embodiment of the lockable or releasable transmission with bidirectional input and
10 one-way output 13.

As shown in Fig. 7, the lockable or releasable transmission with bidirectional input and one-way output 13 is constituted by a planetary gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

15 -- one end of the input shaft 2000 through installed at one side of the shell 500 of the gear train via bearing structure, another end of the input shaft 2000 through the output shaft 3000 via the one-way transmission 302, and a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

20 -- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way
25 output;

-- machine body 600: relatively static organization structure;

-- input shaft 2000 integrated at sun wheel 102;

-- the planetary wheel 103 installed between the outer wheel 104 and the sun wheel 102; the center of the planetary wheel 103 rotating at the
30 planetary wheel shaft 201; one end of the planetary wheel shaft 201

integrated at a planetary wheel support arm ring frame 200, and the planetary wheel support arm ring frame 200 through the one-way transmission 303 for rotating at the input shaft 2000 installed between the sun wheel 102 and the shell 500 of the gear train; and the lockable or
5 releasable mechanism 90 installed between the planetary wheel support arm ring frame 200 and the shell 500 of the gear train;

- the shell 500 of the gear train fixed at the machine body 600;
- A one-way transmission 301 installed between ring structure of the outer wheel 104 and the output shaft 3000;

10 -- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 302 for driving the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;

- by way of the above structure, if the lockable or releasable

15 mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the sun wheel 102 for further driving the planetary wheel 103 and the outer wheel 104, and through the ring structure of the outer wheel 104 and the one-way transmission 301, for driving the output shaft 3000 to produce the first rotary direction output to

20 constitute the second gear train; and

- when reverse drive caused by back move occurs at the output shaft 3000, through releasing the lockable or releasable mechanism 90, idling produced between the shell 500 of the gear train and the planetary wheel support arm ring frame 200, the first gear train and the second gear train

25 are prevented from lock status.

Fig. 8 is a schematic structural view showing the third embodiment of the lockable or releasable transmission with bidirectional input and one-way output 13.

As shown in Fig. 8, the lockable or releasable transmission with
30 bidirectional input and one-way output 13 is constituted by an epicyclic

gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of the input shaft 2000 through installed at one side of the shell 500 of the gear train via bearing structure, another end of the input shaft 2000 through the output shaft 3000 via the one-way transmission 302, and a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

-- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body 600: relatively static organization structure;

-- input shaft 2000 integrated at inward oblique wheel 402;

-- an epicyclic gear 403 installed between an outward oblique wheel 404 and the inward oblique wheel 402; the center of the epicyclic gear 403 rotating at an epicyclic gear shaft 401; one end of the epicyclic gear shaft 401 integrated at an epicyclic gear support arm ring frame 400, and the epicyclic gear support arm ring frame 400 fixed at the shell 500 of the gear train;

-- the lockable or releasable mechanism 90 installed between the shell 500 of the gear train and the machine body 600;

-- the one-way transmission 301 installed between ring structure of the outward oblique wheel 404 and the output shaft 3000;

-- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 302 for driving the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable

mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the inward oblique wheel 402 for further driving the epicyclic gear 403 and the outward oblique wheel 404, and through the outward oblique wheel 404 and the one-way transmission 301, for driving the output shaft 3000 to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft 3000, through releasing the lockable or releasable mechanism 90, idling produced between the shell 500 of the gear train and the machine body 600, the first gear train and the second gear train are prevented from lock status.

Fig. 9 is a schematic structural view showing the fourth embodiment of the lockable or releasable transmission with bidirectional input and one-way output 13.

As showing in Fig. 9, the lockable or releasable transmission with bidirectional input and one-way output 13 is constituted by an epicyclic gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of the input shaft 2000 through installed at one side of the shell 500 of the gear train via bearing structure, another end of the input shaft 2000 through the output shaft 3000 via the one-way transmission 302, and a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

-- lockable or releasable mechanism 90: related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body 600: relatively static organization structure;

-- input shaft 2000 integrated at inward oblique wheel 402;

-- the epicyclic gear 403 installed between the outward oblique wheel 404 and the inward oblique wheel 402; the center of the epicyclic gear 403 rotating at the epicyclic gear shaft 401; one end of the epicyclic gear shaft 401 integrated at the epicyclic gear support arm ring frame 400, and the epicyclic gear support arm ring frame 400 through the one-way transmission 303, for rotating at the input shaft 2000 installed between the inward oblique wheel 402 and the one-way transmission 302;

-- the lockable or releasable mechanism 90 installed between the epicyclic gear support arm ring frame 400 and the shell 500 of the gear train;

-- the shell 500 of the gear train fixed at the machine body 600;

-- the one-way transmission 301 installed between the outward oblique wheel 404 and the output shaft 3000;

-- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 302 for driving the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the inward oblique wheel 402 for further driving the epicyclic gear 403 and the outward oblique wheel 404, and through the outward oblique wheel 404 and the one-way transmission 301, for driving the output shaft 3000 to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft 3000, through releasing the lockable or releasable mechanism 90, idling produced between the shell 500 of the gear train and the epicyclic gear support arm ring frame 400, the first gear train and the second gear train are prevented from lock status.

Fig. 10 is a schematic structural view showing the fifth embodiment of the lockable or releasable transmission with bidirectional input and one-way output 13.

As shown in Fig. 10, the lockable or releasable transmission with
5 bidirectional input and one-way output 13 is integrated constituted by a transmission with different transmission rotary direction, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of the input shaft 2000 through installed at one side of the
10 shell 500 of the gear train via bearing structure, another end of the input shaft 2000 through the output shaft 3000 via the one-way transmission 301; a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

-- lockable or releasable mechanism 90: related to a mechanism
15 driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

20 -- machine body 600: relatively static organization structure;

-- input shaft 2000 through a driving wheel 602, and an one-way transmission 305 installed between the above both;

-- the driving wheel 602 and a driving wheel 603 transmitting at different rotary directions, the driving wheel 603 and a driving wheel 616
25 working together on a revolving shaft 604, and a bearing installed between the revolving shaft 604 and the shell 500 of the gear train;

-- driving wheel 616 rotating at a driving wheel 617 of a revolving shaft 618, and further driving a driving wheel 615 for constituting a driving wheel group with same rotary direction;

30 -- the revolving shaft 618 integrated at the shell 500 of the gear train;

-- the driving wheel 615 integrated at the output shaft 3000;
-- the lockable or releasable mechanism 90 installed between the shell 500 of the gear train and the machine body 600;
-- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 301 for driving the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;
-- by way of the above structure, if the lockable or releasable mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the one-way transmission 305 for driving the driving wheel 602, then the driving wheel 602 driving the driving wheel 603 and the driving wheel 616, then the driving wheel 616 through the driving wheel 617 for further driving the driving wheel 615, and the driving wheel 615 driving the output shaft 3000 to produce the first rotary direction output to constitute the second gear train; and
-- when reverse drive caused by back move occurs at the output shaft 3000, through releasing the lockable or releasable mechanism 90, idling produced between the shell 500 of the gear train and the machine body 600, the first gear train and the second gear train are prevented from lock status.

Fig. 11 is a schematic structural view showing the 6th embodiment of the lockable or releasable transmission with bidirectional input and one-way output 13.

As shown in Fig. 11, the lockable or releasable transmission with bidirectional input and one-way output 13 is integrated constituted by a transmission with different transmission rotary direction, and the input shaft and the output shaft are coaxial string set, the main components including:

-- one end of the input shaft 2000 through installed at one side of the shell 500 of the gear train via bearing structure, another end of the input

shaft 2000 through the output shaft 3000 via the one-way transmission 301; a bearing installed between the output shaft 3000 and the shell 500 of the gear train;

-- lockable or releasable mechanism 90: related to a mechanism
5 driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell 500 of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

10 -- machine body 600: relatively static organization structure;

-- input shaft 2000 through the driving wheel 602, and the one-way transmission 305 installed between the above both;

-- the driving wheel 602 and the driving wheel 603 transmitting at different rotary directions, the driving wheel 603 and the driving wheel
15 606 working together on the revolving shaft 604, and a bearing installed between the revolving shaft 604 and the shell 500 of the gear train;

-- the driving wheel 606 and the driving wheel 605 are driving wheel group with same rotary direction constituted through a belt wheel, a chain wheel, or an internal gear of the driving belt 607 for transmission;

20 -- the driving wheel 605 integrated at the output shaft 3000;

-- the lockable or releasable mechanism 90 installed between the shell 500 of the gear train and the machine body 600;

-- by way of the above structure, the input shaft 2000 driven at the first rotary direction, through the one-way transmission 301 for driving
25 the output shaft 3000 to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable mechanism 90 is locked, the input shaft 2000 is driven at the second rotary direction, through the one-way transmission 305 for driving the
30 driving wheel 602, then the driving wheel 602 driving the driving wheel

603 and the driving wheel 606, then the driving wheel 606 driving the driving wheel 605, for further driving the output shaft 3000 to produce the first rotary direction output to constitute the second gear train; and

- when reverse drive caused by back move occurs at the output shaft
- 5 3000, through releasing the lockable or releasable mechanism 90, idling produced between the shell 500 of the gear train and the machine body 600, the first gear train and the second gear train are prevented from lock status.

CLAIMS

1. A lockable or releasable bicycle with bidirectional input and one-way output, which is a human input device with dual rotary direction input, in which the output terminal thereof connects to the input
5 terminal of a specific lockable or releasable transmission with bidirectional input and one-way output, the constant rotary direction output through the output terminal of the lockable or releasable transmission with bidirectional input and one-way output to drive a load wheel group, and further to drive a vehicle combined with the
10 load wheel group; the rider chooses the direction of pedal-driven input, and makes constant rotary direction output at different driven input direction through the lockable or releasable transmission with bidirectional input and one-way output with same or different speed ratio, and when the load wheel group moves backwards, i.e. reverse
15 drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism, the lockable or releasable bicycle with bidirectional input and one-way output is prevented from locking; and
except for the components of the pedal vehicle and a machine body
20 (600), the main components of the structure of the lockable or releasable bicycle with bidirectional input and one-way output include:
-- human input device (11): constituted by an output mechanism with
25 dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary
direction mechanism by human power; in which
30 -- the kinetic energy of the first driving rotary direction and the input

kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device (11);

-- the first driving rotary direction and the second driving rotary direction are reverse;

-- lockable or releasable transmission with bidirectional input and one-way output (13): which is driven by different rotary direction kinetic energy from the human input device (11), and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism (90), when reverse drive caused by back move occurs at the output terminal; in which

the transmission components within the lockable or releasable transmission with bidirectional input and one-way output (13) are constituted by one or more of the followings integrated with the lockable or releasable mechanism (90), including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output (13) is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output (13) are as following:

-- the first rotary direction and the second rotary direction are reverse;

-- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

-- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

-- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

-- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

-- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output (13), the radial or axial lockable or releasable mechanism (90) is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism (90), the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power,

or aerodynamic force, or fluid power, or electromagnetic force; and
-- load wheel group (15): directly driven by the output terminal of the
lockable or releasable transmission with bidirectional input and
one-way output (13), and further driving a vehicle integrated with the
5 load wheel group (15); in which
for the lockable or releasable bicycle with bidirectional input and
one-way output, which drives through the human input device (11)
by human's foot at the first driving rotary direction, or at the second
rotary direction with different rotary direction from the first driving
10 rotary direction, the kinetic energy output from the output terminal of
the human input device (11) is transmitted to the input terminal of
the lockable or releasable transmission with bidirectional input and
one-way output (13) via the additionally installed bugtriebwerk (12),
and the output terminal of the lockable or releasable transmission
15 with bidirectional input and one-way output (13) outputs kinetic
energy with constant rotary direction, to drive the load wheel group
(15), and to further drive a vehicle integrated with the load wheel
group (15).

2. The lockable or releasable bicycle with bidirectional input and
20 one-way output as claimed in Claim 1, wherein the bugtriebwerk (12)
is additionally installed between the human input device (11) and the
lockable or releasable transmission with bidirectional input and
one-way output (13), except for the components of the pedal vehicle
and a machine body (600), the main components include:

25 -- human input device (11): constituted by an output mechanism with
dual rotary direction, which receives forward or reverse rotary driven
input or reciprocating driven input from human's foot to produce
forward or reverse rotation, including a pedal, a crank, and a driving
wheel group with dual rotary direction, or a handle, a hand shank,
30 and a driving wheel group with dual rotary direction, i.e. dual rotary

direction mechanism by human power; in which

- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device (11);
- the first driving rotary direction and the second driving rotary direction are reverse;
- bugtriebwerk (12): constituted by one or more of the following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio; in which the bugtriebwerk (12) is driven by the human input device (11) and outputs rotary kinetic energy for driving the lockable or releasable transmission with bidirectional input and one-way output (13);
- lockable or releasable transmission with bidirectional input and one-way output (13): which is driven by different rotary direction kinetic energy from the bugtriebwerk (12), and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism (90), when reverse drive caused by back move occurs at the output terminal; in which the transmission components within the lockable or releasable transmission with bidirectional input and one-way output (13) are constituted by one or more of the followings integrated with the lockable or releasable mechanism (90), including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output (13) is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output (13) are as following:

- the first rotary direction and the second rotary direction are reverse;
- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;
- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;
- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;
- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;
- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output (13), the radial or axial lockable or releasable mechanism (90) is installed at one or more of the following positions, including: between the machine body and

the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism (90), the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force; and

-- load wheel group (15): directly driven by the output terminal of the lockable or releasable transmission with bidirectional input and one-way output (13), and further driving a vehicle integrated with the load wheel group (15); in which

for the lockable or releasable bicycle with bidirectional input and one-way output, the kinetic energy output from the output terminal of the human input device (11), which is forward or reversely driven by human's foot, is transmitted to the lockable or releasable transmission with bidirectional input and one-way output (13), and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output (13) outputs kinetic energy with constant rotary direction, to drive the load wheel group (15) via the additionally installed posterior transmission (14), and to further drive a vehicle integrated with the load wheel group (15).

3. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the posterior transmission (14) is additionally installed between the lockable or releasable transmission with bidirectional input and one-way output (13) and the load wheel group (15), except for the components of the pedal vehicle and a machine body (600), the main components

include:

- 5 -- human input device (11): constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which
- 10 -- the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device (11);
- the first driving rotary direction and the second driving rotary direction are reverse;
- 15 -- lockable or releasable transmission with bidirectional input and one-way output (13): which is driven by different rotary direction kinetic energy from the human input device (11) through the bugtriebwerk (12), and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional
- 20 input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism (90), when reverse drive caused by back move occurs at the output terminal; in which the transmission components within the lockable or releasable transmission with bidirectional input and one-way output (13) are
- 25 constituted by one or more of the followings integrated with the lockable or releasable mechanism (90), including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7)
- 30 electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output (13) is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output (13) are as following:

- the first rotary direction and the second rotary direction are reverse;
- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;
- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;
- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;
- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;
- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output (13), the radial or axial lockable or releasable mechanism (90) is installed at one or more of the following positions, including: between the machine body and

the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism (90), the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- posterior transmission (14): constituted by one or more of the following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio, for being driven by the lockable or releasable transmission with bidirectional input and one-way output (13), and the output terminal is used to drive the load wheel group (15); and

-- load wheel group (15): directly driven by the output terminal of the posterior transmission (14), and further driving a vehicle integrated with the load wheel group (15); in which

for the lockable or releasable bicycle with bidirectional input and one-way output, which drives the human input device (11) through forward or reverse rotation by human's foot, the output terminal outputs rotary kinetic energy transmitted to the input terminal of the lockable or releasable transmission with bidirectional input and one-way output (13) through the additionally installed bugtriebwerk (12), and the output terminal of the lockable or releasable transmission with bidirectional input and one-way output (13) outputs constant rotary direction output, to drive the load wheel group (15) through the additionally installed posterior transmission

(14), and to further drive a vehicle integrated with the load wheel group (15).

4. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the bugtriebwerk (12) is additionally installed between the human input device (11) and the lockable or releasable transmission with bidirectional input and one-way output (13), and the posterior transmission (14) is additionally installed between the lockable or releasable transmission with bidirectional input and one-way output (13) and the load wheel group (15), except for the components of the pedal vehicle and a machine body (600), the main components include:
- human input device (11): constituted by an output mechanism with dual rotary direction, which receives forward or reverse rotary driven input or reciprocating driven input from human's foot to produce forward or reverse rotation, including a pedal, a crank, and a driving wheel group with dual rotary direction, or a handle, a hand shank, and a driving wheel group with dual rotary direction, i.e. dual rotary direction mechanism by human power; in which
 - the kinetic energy of the first driving rotary direction and the input kinetic energy of the second driving rotary direction derived from human's foot driving the input terminal of the human input device (11);
 - the first driving rotary direction and the second driving rotary direction are reverse;
 - bugtriebwerk (12): constituted by one or more of the following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type, with constant speed ratio or variable speed ratio; in which the bugtriebwerk (12) is driven by the human input device (11) and outputs rotary kinetic energy for driving the lockable or releasable

transmission with bidirectional input and one-way output (13);

-- lockable or releasable transmission with bidirectional input and one-way output (13): which is driven by different rotary direction kinetic energy from the bugtriebwerk (12), and outputs constant rotary direction kinetic energy; and the lockable or releasable bicycle with bidirectional input and one-way output has the anti-locking function, through releasing the lockable or releasable mechanism (90), when reverse drive caused by back move occurs at the output terminal; in which

the transmission components within the lockable or releasable transmission with bidirectional input and one-way output (13) are constituted by one or more of the followings integrated with the lockable or releasable mechanism (90), including (1) gear unit; and/or (2) friction wheel group; and/or (3) chain and sprocket section; and/or (4) belt and pulley section; and/or (5) transmission crank and wheels set; and/or (6) fluid transmission unit; and/or (7) electromagnetic force actuator; and

when the lockable or releasable transmission with bidirectional input and one-way output (13) is driven through being input the first driving rotary direction and the second driving rotary direction, which are different rotary directions, the speed ratio between the input terminal and the output terminal with constant rotary direction is same, different, or variable; in which

the main transmission structure and operational features of the lockable or releasable transmission with bidirectional input and one-way output (13) are as following:

-- the first rotary direction and the second rotary direction are reverse;

-- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving

the output terminal;

-- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train driving the output terminal;

5 -- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

10 -- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

15 -- in the gear train structure with dual rotary direction input and same rotary direction output of the lockable or releasable transmission with bidirectional input and one-way output (13), the radial or axial lockable or releasable mechanism (90) is installed at one or more of the following positions, including: between the machine body and the rotatable shell of the gear train with bidirectional input and one-way output; or between the fixed shell and the rotating parts of

20 the gear train with bidirectional input and one-way output; thus when reverse drive caused by back move occurs at the output terminal, through releasing the lockable or releasable mechanism (90), the gear train structure with dual rotary direction input and same rotary direction output is prevented from rigid lock status;

25 -- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

30 -- posterior transmission (14): constituted by one or more of the following transmissions including various rotary transmission functional structures, such as gear type, belt type, or friction-type,

with constant speed ratio or variable speed ratio, for being driven by the lockable or releasable transmission with bidirectional input and one-way output (13), and the output terminal is used to drive the load wheel group (15); and

5 -- load wheel group (15): directly driven by the output terminal of the posterior transmission (14), and further driving a vehicle integrated with the load wheel group (15).

5. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the operational
10 features of the structural unit of the installed lockable or releasable transmission with bidirectional input and one-way output (13) are as following:

 -- the first rotary direction and the second rotary direction are reverse;

15 -- if the input terminal is driven by the first rotary direction, the first rotary direction output is produced through the first gear train driving the output terminal;

 -- if the input terminal is driven by the second rotary direction, the first rotary direction output is produced through the second gear train
20 driving the output terminal;

 -- an one-way transmission is installed between the first gear train and the second gear train to avoid the interference from the second gear train when the first gear train is used to be the first rotary direction input and produces the first rotary direction output;

25 -- an one-way transmission is installed between the second gear train and the first gear train to avoid the interference from the first gear train when the second gear train is used to be the second rotary direction input and produces the first rotary direction output;

 -- by way of being installed the lockable or releasable mechanism
30 (90) between the rotatable shell of the gear train and the machine body,

or between the fixed shell and the rotating parts of the gear train with bidirectional input and one-way output, when the output terminal of the gear train with bidirectional input and one-way output drives the input terminal at reverse rotary direction, through releasing the lockable or releasable mechanism (90), the gear train is prevented from rigid lock status.

5

6. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or releasable transmission with bidirectional input and one-way output

10 (13) is constituted by a planetary gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of an input shaft (2000) through installed at one side of a shell (500) of the gear train via bearing structure, another end of the input shaft (2000) through an output shaft (3000) via an one-way transmission (302), and a bearing installed between the output shaft

15 (3000) and the shell (500) of the gear train;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

20 -- shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body (600): relatively static organization structure;

-- a planetary wheel (103) installed between the outer wheel (104) and the sun wheel (102); the center of the planetary wheel (103) rotating at a planetary wheel shaft (201), and one end of the planetary wheel shaft (201) fixed at the shell (500) of the gear train;

25 -- the lockable or releasable mechanism (90) installed between the shell (500) of the gear train and the machine body (600);

30 -- A one-way transmission (301) installed between ring structure of

the outer wheel (104) and the output shaft (3000);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (302) for driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

5 -- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the sun wheel (102) for further driving the planetary wheel (103) and the outer wheel (104), and

10 through the ring structure of the outer wheel (104) and the one-way transmission (301), for driving the output shaft (3000) to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft (3000), through releasing the lockable or releasable mechanism (90),

15 idling produced between the shell (500) of the gear train and the machine body (600), the first gear train and the second gear train are prevented from lock status.

7. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or

20 releasable transmission with bidirectional input and one-way output (13) is constituted by a planetary gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of the input shaft (2000) through installed at one side of the shell (500) of the gear train via bearing structure, another end of

25 the input shaft (2000) through the output shaft (3000) via the one-way transmission (302), and a bearing installed between the output shaft (3000) and the shell (500) of the gear train;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power,

30 or aerodynamic force, or fluid power, or electromagnetic force;

-- shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body (600): relatively static organization structure;

5 -- the planetary wheel (103) installed between the outer wheel (104) and the sun wheel (102); the center of the planetary wheel (103) rotating at the planetary wheel shaft (201); one end of the planetary wheel shaft (201) integrated at a planetary wheel support arm ring frame (200), and the planetary wheel support arm ring frame (200)

10 through the one-way transmission 303 for rotating at the input shaft (2000) installed between the sun wheel (102) and the shell (500) of the gear train; and the lockable or releasable mechanism (90) installed between the planetary wheel support arm ring frame (200) and the shell (500) of the gear train;

15 -- the shell (500) of the gear train fixed at the machine body (600);

-- a one-way transmission (301) installed between ring structure of the outer wheel (104) and the output shaft (3000);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (302) for

20 driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the sun wheel (102) for further

25 driving the planetary wheel (103) and the outer wheel (104), and through the ring structure of the outer wheel (104) and the one-way transmission (301), for driving the output shaft (3000) to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft

30 (3000), through releasing the lockable or releasable mechanism (90),

idling produced between the shell (500) of the gear train and the planetary wheel support arm ring frame (200), the first gear train and the second gear train are prevented from lock status.

8. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or releasable transmission with bidirectional input and one-way output (13) is constituted by an epicyclic gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:
- one end of the input shaft (2000) through installed at one side of the shell (500) of the gear train via bearing structure, another end of the input shaft (2000) through the output shaft (3000) via the one-way transmission (302), and a bearing installed between the output shaft (3000) and the shell (500) of the gear train;
 - lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;
 - shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;
 - machine body (600): relatively static organization structure;
 - input shaft (2000) integrated at inward oblique wheel (402);
 - an epicyclic gear (403) installed between an outward oblique wheel (404) and the inward oblique wheel (402); the center of the epicyclic gear (403) rotating at an epicyclic gear shaft (401); one end of the epicyclic gear shaft (401) integrated at an epicyclic gear support arm ring frame (400), and the epicyclic gear support arm ring frame (400) fixed at the shell (500) of the gear train;
 - the lockable or releasable mechanism (90) installed between the shell (500) of the gear train and the machine body (600);
 - the one-way transmission (301) installed between ring structure of

the outward oblique wheel (404) and the output shaft (3000);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (302) for driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

5 -- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the inward oblique wheel (402) for further driving the epicyclic gear (403) and the outward oblique wheel (404), and through the outward oblique wheel (404) and the one-way transmission (301), for driving the output shaft (3000) to produce the first rotary direction output to constitute the second gear train; and

10 -- when reverse drive caused by back move occurs at the output shaft (3000), through releasing the lockable or releasable mechanism (90), idling produced between the shell (500) of the gear train and the machine body (600), the first gear train and the second gear train are prevented from lock status.

15

9. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or releasable transmission with bidirectional input and one-way output (13) is constituted by an epicyclic gear train, and the input shaft and the output shaft are coaxial fitting, the main components including:

20 -- one end of the input shaft (2000) through installed at one side of the shell (500) of the gear train via bearing structure, another end of the input shaft (2000) through the output shaft (3000) via the one-way transmission (302), and a bearing installed between the output shaft (3000) and the shell (500) of the gear train;

25 -- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power,

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or aerodynamic force, or fluid power, or electromagnetic force;

-- shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

5 -- machine body (600): relatively static organization structure;

-- input shaft (2000) integrated at inward oblique wheel (402);

-- the epicyclic gear (403) installed between the outward oblique wheel (404) and the inward oblique wheel (402); the center of the epicyclic gear (403) rotating at the epicyclic gear shaft (401); one

10 end of the epicyclic gear shaft (401) integrated at the epicyclic gear support arm ring frame (400), and the epicyclic gear support arm ring frame (400) through the one-way transmission (303), for rotating at the input shaft (2000) installed between the inward oblique wheel (402) and the one-way transmission (302);

15 -- the lockable or releasable mechanism (90) installed between the epicyclic gear support arm ring frame (400) and the shell (500) of the gear train;

-- the shell (500) of the gear train fixed at the machine body (600);

-- the one-way transmission (301) installed between the outward

20 oblique wheel (404) and the output shaft (3000);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (302) for driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

25 -- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the inward oblique wheel (402) for further driving the epicyclic gear (403) and the outward oblique wheel (404), and through the outward oblique wheel (404) and the

30 one-way transmission (301), for driving the output shaft (3000) to

produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft (3000), through releasing the lockable or releasable mechanism (90), idling produced between the shell (500) of the gear train and the epicyclic gear support arm ring frame (400), the first gear train and the second gear train are prevented from lock status.

10. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or releasable transmission with bidirectional input and one-way output (13) is integrated constituted by a transmission with different transmission rotary direction, and the input shaft and the output shaft are coaxial fitting, the main components including:

-- one end of the input shaft (2000) through installed at one side of the shell (500) of the gear train via bearing structure, another end of the input shaft (2000) through the output shaft (3000) via the one-way transmission (301); a bearing installed between the output shaft (3000) and the shell (500) of the gear train;

-- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;

-- shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional input and one-way output;

-- machine body (600): relatively static organization structure;

-- input shaft (2000) through a driving wheel (602), and an one-way transmission (305) installed between the above both;

-- the driving wheel (602) and a driving wheel (603) transmitting at different rotary directions, the driving wheel (603) and a driving wheel (616) working together on a revolving shaft (604), and a

bearing installed between the revolving shaft (604) and the shell (500) of the gear train;

-- driving wheel (616) rotating at a driving wheel (617) of a revolving shaft (618), and further driving a driving wheel (615) for constituting a driving wheel group with same rotary direction;

-- the revolving shaft (618) integrated at the shell (500) of the gear train;

-- the driving wheel (615) integrated at the output shaft (3000);

-- the lockable or releasable mechanism (90) installed between the shell (500) of the gear train and the machine body (600);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (301) for driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

-- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the one-way transmission (305) for driving the driving wheel (602), then the driving wheel (602) driving the driving wheel (603) and the driving wheel (616), then the driving wheel (616) through the driving wheel (617) for further driving the driving wheel (615), and the driving wheel (615) driving the output shaft (3000) to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft (3000), through releasing the lockable or releasable mechanism (90), idling produced between the shell (500) of the gear train and the machine body (600), the first gear train and the second gear train are prevented from lock status.

11. The lockable or releasable bicycle with bidirectional input and one-way output as claimed in Claim 1, wherein the lockable or

releasable transmission with bidirectional input and one-way output (13) is integrated constituted by a transmission with different transmission rotary direction, and the input shaft and the output shaft are coaxial string set, the main components including:

- 5 -- one end of the input shaft (2000) through installed at one side of the shell (500) of the gear train via bearing structure, another end of the input shaft (2000) through the output shaft (3000) via the one-way transmission (301); a bearing installed between the output shaft (3000) and the shell (500) of the gear train;
- 10 -- lockable or releasable mechanism (90): related to a mechanism driven to be locked or released by human power, or machine power, or aerodynamic force, or fluid power, or electromagnetic force;
- shell (500) of the gear train: machine parts installed for constituting the lockable or releasable gear train with bidirectional
- 15 input and one-way output;
- machine body (600): relatively static organization structure;
- input shaft (2000) through the driving wheel (602), and the one-way transmission (305) installed between the above both;
- the driving wheel (602) and the driving wheel (603) transmitting at
- 20 different rotary directions, the driving wheel (603) and the driving wheel (606) working together on the revolving shaft (604), and a bearing installed between the revolving shaft (604) and the shell (500) of the gear train;
- the driving wheel (606) and the driving wheel (605) are driving
- 25 wheel group with same rotary direction constituted through a belt wheel, a chain wheel, or an internal gear of the driving belt (607) for transmission;
- the driving wheel (605) integrated at the output shaft (3000);
- the lockable or releasable mechanism (90) installed between the
- 30 shell (500) of the gear train and the machine body (600);

-- by way of the above structure, the input shaft (2000) driven at the first rotary direction, through the one-way transmission (301) for driving the output shaft (3000) to produce the first rotary direction output to constitute the first gear train;

5 -- by way of the above structure, if the lockable or releasable mechanism (90) is locked, the input shaft (2000) is driven at the second rotary direction, through the one-way transmission (305) for driving the driving wheel (602), then the driving wheel (602) driving the driving wheel (603) and the driving wheel (606), then the driving

10 wheel (606) driving the driving wheel (605), for further driving the output shaft (3000) to produce the first rotary direction output to constitute the second gear train; and

-- when reverse drive caused by back move occurs at the output shaft (3000), through releasing the lockable or releasable mechanism (90),

15 idling produced between the shell (500) of the gear train and the machine body (600), the first gear train and the second gear train are prevented from lock status.