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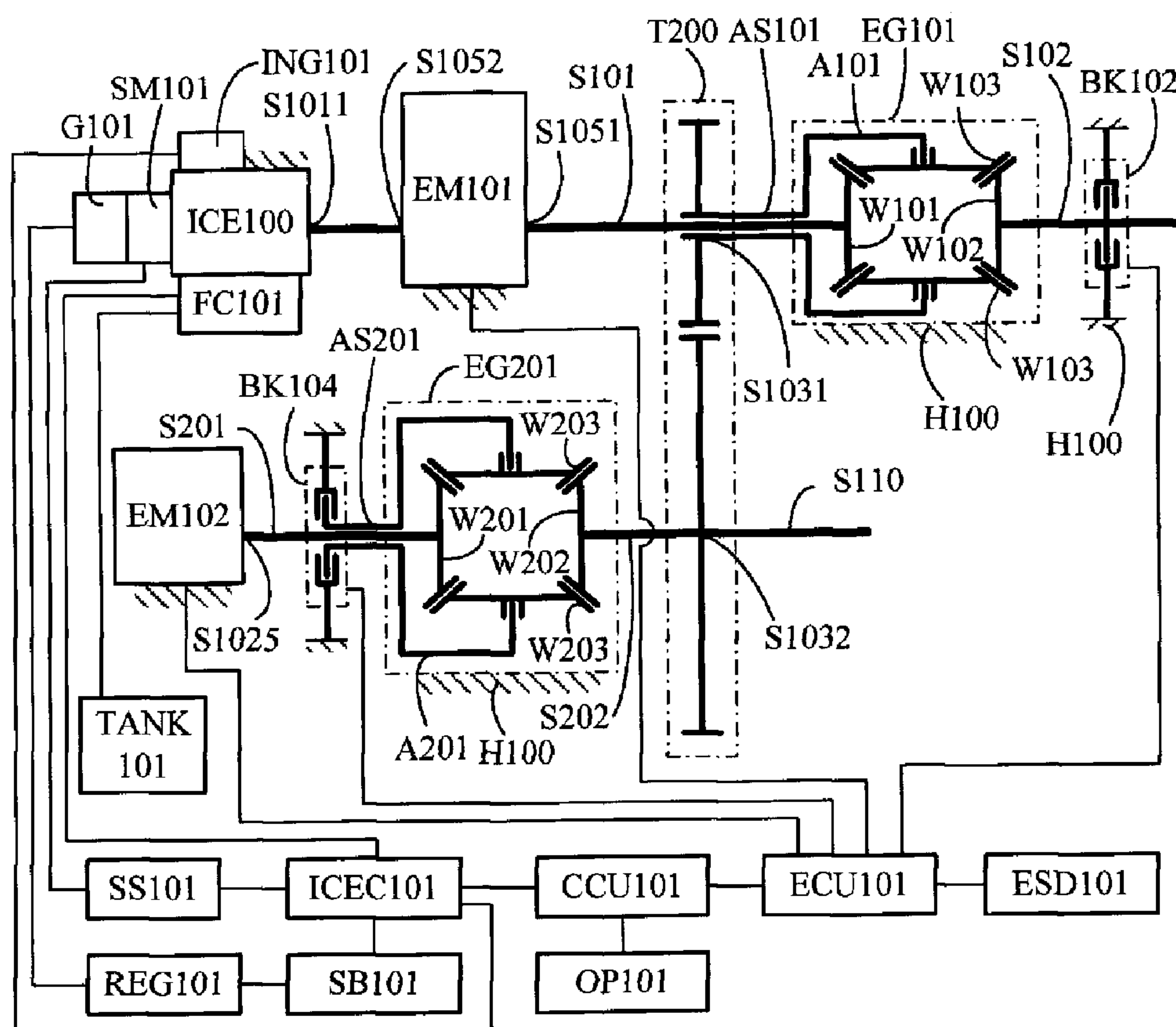
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(54) Titre : GROUPE MOTOPROPULSEUR HYBRIDE EQUIPE D'UN DISPOSITIF D'EMBRAYAGE DE TYPE
EPICYCLOIDAL

(54) Title: HYBRID POWER TRAIN HAVING EPICYCLIC TYPE CLUTCH DEVICE



ABSTRACT

The present invention is through an epicyclic gear set and a controllable brake device to structure the clutch function, so as to replace the conventional friction type electromagnetic clutch device, and combined with two or more than two of one or more rotary kinetic power device to constitute a hybrid power train having epicyclic type clutch device.

**TITLE: HYBRID POWER TRAIN HAVING EPICYCLIC TYPE
CLUTCH DEVICE**

BACKGROUND OF THE INVENTION

5 (a) Field of the Invention

The present invention is through an epicyclic gear set and a controllable brake device to structure the clutch function, so as to replace the conventional friction type electromagnetic clutch device, and combined with two or more than two of one or more rotary kinetic power
10 device to constitute a hybrid power train having epicyclic type clutch device.

(b) Description of the Prior Art

A friction type electromagnetic clutch device is often installed
15 between conventional automatic or semi-automatic power trains or hybrid power trains for performing engagement or disengagement, so that the power train is enabled to perform various functional operations; however, when the friction type electromagnetic clutch device is in a disengaged state, residual torque may remain, and thereby to cause power loss and
20 system malfunction.

SUMMARY OF THE INVENTION

The present invention provides a hybrid power train having epicyclic type clutch device, in which the controllable brake device is used to
25 control the power train having the epicyclic gear set serving as a clutch device, which can be widely applied in a hybrid power train with dual rotary kinetic power devices composed of an engine (ICE100) and a rotational electric machine mainly served as motor function (EM102), or a hybrid power train with triple rotary kinetic power sources composed of
30 an engine (ICE100) and a rotational electric machine mainly served as

power generator function (EM101) and a rotational electric machine
mainly served as motor function (EM102), wherein the structural
configuration of each rotary kinetic power device combining with a
transmission device includes a coaxial in-series structure or a multiple
5 axial in-parallel structure for satisfying the requirement of applied space.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a schematic structural view showing a rocker arm (A101) and
a sleeve type rotation shaft (AS101) driven by an engine (ICE100) and an
10 epicyclic wheel (W103) of an epicyclic gear set (EG101) being combined
with a controllable brake device (BK101), and an input wheel (W102) of
the epicyclic gear set (EG101) and an output/input end of a rotation shaft
(S102) being combined with a rotational electric machine mainly served
as motor function (EM102) and an output/input end rotation shaft
15 (S1026), according to one embodiment of the present invention.

FIG. 2 is a schematic view showing the structure shown in FIG. 1
wherein a first transmission device (T1) being installed between the
engine (ICE100) and the controllable brake device (BK101), and the input
wheel (W102) of the epicyclic gear set (EG101) and the output/input end
20 of the rotation shaft (S102) being combined with the rotational electric
machine mainly served as motor function (EM102) and the output/input
end rotation shaft (S1026), according to one embodiment of the present
invention.

FIG. 3 is a schematic view showing the rotational electric machine
25 mainly served as power generator function (EM101) being installed
between the engine (ICE100) and the controllable brake device (BK101)
shown in FIG. 1, according to one embodiment of the present invention.

FIG. 4 is a schematic view showing the rotational electric machine
mainly served as power generator function (EM101) being installed
30 between the first transmission device (T1) and the controllable brake

device (BK101) shown in FIG. 2, according to one embodiment of the present invention.

FIG. 5 is a schematic structural view showing the present invention being structured by the engine (ICE100) and a transmission unit (T200) and the epicyclic gear set (EG101) and a controllable brake device (BK102), the output wheel (W102) of the epicyclic gear set (EG101) and the output/input end of the rotation shaft (S102) being combined with the rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) being provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) being used to drive the input end of the transmission unit (T200), and the output end of the transmission unit (T200) being installed with a rotation shaft (S110), according to one embodiment of the present invention.

FIG. 6 is a schematic view showing the structure in FIG. 5 in which the input wheel (W101) of the epicyclic gear set (EG101) being combined with the rotation shaft (S101) and combined with the rotation shaft (S1011) of the engine (ICE100), the rotation shaft (S101) being combined to an action side of a controllable brake device (BK103), and the other action end of the controllable brake device (BK103) being fixed in the housing (H100), the output/input end of the rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) being combined with a rocker arm (A111) of a planetary gear set (T300), an outer annular wheel (W113) of the planetary gear set (T300) being fixed in the housing (H100), a sun wheel (W111) of the planetary gear set (T300) being combined with the rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) being provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) being provided for driving the input end of the transmission unit

(T200), according to one embodiment of the present invention.

FIG. 7 is a schematic view showing the rotational electric machine mainly served as motor function (EM102) shown in FIG. 5 being installed at one end of the output/input end rotation shaft (S110) of the transmission unit (T200).

FIG. 8 is a schematic view showing the structure shown in FIG. 7 in which an epicyclic gear set (EG201) and a controllable brake device (BK104) being installed between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102).

FIG. 9 is a schematic view showing the structure shown in FIG. 7 in which the rotational electric machine mainly served as power generator function (EM101) being installed between the engine (ICE100) and the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101).

FIG. 10 is a schematic view showing the structure shown in FIG. 9 in which the epicyclic gear set (EG201) and the controllable brake device (BK104) being installed between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102).

DESCRIPTION OF MAIN COMPONENT SYMBOLS

A101 、 A111 、 A201 : Rocker arm
 AS101 、 AS201 : Sleeve type rotation shaft
 BK101 、 BK102 、 BK103 、 BK104 : Controllable brake device
 CCU101 : Central control unit
 ECU101 : Drive electric circuit unit
 EG101 、 EG201 : Epicyclic gear set
 EM101 : Rotational electric machine mainly served as power generator function
 EM102 : Rotational electric machine mainly served as motor function

- ESD101 : Electricity storage device
- FC101 : Fuel control device
- G101 : Power generator
- H100 : Housing
- 5 ICE100 : Engine
- ICEC101 : Engine operation control device
- ING101 : Ignition device
- OP101 : Operation interface
- REG101 : Regulation device
- 10 S101 、S102 、S110 、S201 、S202 、S1011 、S1012 、S1013 、S1024 、
S1025 、S1026 、S1031 、S1032 、S1051 、S1052 : Rotation shaft
- SB101 : Start battery
- SM101 : Start motor
- SS101 : Start switch
- 15 T1 : First transmission device
- T200 : Transmission unit
- T300 : Planetary gear set
- TANK101 : Fuel tank
- W101 、W201 : Input wheel
- 20 W102 、W202 : Output wheel
- W103 、W203 : Epicyclic wheel
- W111 : Sun wheel
- W112 : Planetary wheel
- W113 : Outer annular wheel

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A friction type electromagnetic clutch device is often installed between conventional automatic or semi-automatic power trains or hybrid power trains for performing engagement or disengagement, so that the

30 power train is enabled to perform various functional operations; however,

when the friction type electromagnetic clutch device is in a disengaged state, residual torque may remain, and thereby to cause power loss and system malfunction.

The present invention is through an epicyclic gear set and a controllable brake device to structure the clutch function, so as to replace the conventional friction type electromagnetic clutch device, and combined with two or more than two of one or more rotary kinetic power device to constitute a hybrid power train having epicyclic type clutch device.

The present invention provides a hybrid power train having epicyclic type clutch device, in which the controllable brake device is used to control the power train having the epicyclic gear set serving as a clutch device, which can be widely applied in a hybrid power train with dual rotary kinetic power devices composed of an engine (ICE100) and a rotational electric machine mainly served as motor function (EM102), or a hybrid power train with triple rotary kinetic power sources composed of an engine (ICE100) and a rotational electric machine mainly served as power generator function (EM101) and a rotational electric machine mainly served as motor function (EM102), wherein the structural configuration of each rotary kinetic power device combining with a transmission device includes a coaxial in-series structure or a multiple axial in-parallel structure for satisfying the requirement of applied space.

The structures and embodiments of the hybrid power train having epicyclic type clutch device are as followings:

FIG.1 is a schematic structural view showing a rocker arm (A101) and a sleeve type rotation shaft (AS101) driven by an engine (ICE100) and an epicyclic wheel (W103) of an epicyclic gear set (EG101) being combined with a controllable brake device (BK101), and an input wheel (W102) of the epicyclic gear set (EG101) and an output/input end of a rotation shaft (S102) being combined with a rotational electric machine mainly served

as motor function (EM102) and an output/input end rotation shaft (S1026), according to one embodiment of the present invention.

As shown in FIG. 1, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an
5 internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or
10 constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel
15 (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type
20 rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
25 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);

--One end of the rotation shaft (S101) is combined with the input
30 wheel (W101) of the epicyclic gear set (EG101), the other end of the

rotation shaft (S101) is combined with an output/input end rotation shaft (S1011) of the engine (ICE100), and the rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is served as an output/input end for being combined with an output/input end
 5 rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), the other output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102) is combined with a rotation shaft (S1026) for being served as an output/input end;

10 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake
 15 device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled
 20 to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft
 25 (S1026);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless
 30 DC or AC motor, or constituted by a start motor having power generator

function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel

jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen
 5 containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by
 10 electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator
 15 function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the
 20 engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to
 25 control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted
 30 by electromechanical or electronic units and control mechanisms.

FIG. 2 is a schematic view showing the structure shown in FIG. 1 wherein a first transmission device (T1) being installed between the engine (ICE100) and the controllable brake device (BK101), and the input wheel (W102) of the epicyclic gear set (EG101) and the output/input end
 5 of the rotation shaft (S102) being combined with the rotational electric machine mainly served as motor function (EM102) and the output/input end rotation shaft (S1026), according to one embodiment of the present invention.

As shown in FIG. 2, it mainly consists of:

10 --Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function
 15 (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

20 -- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft
 25 (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic
 30 force or pneumatic force or electromagnetic force, and having two

controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);

5 --First transmission device (T1): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission
10 gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

 --The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1012) of the first transmission device
15 (T1), and the output/input end rotation shaft (S1013) at the other end of the first transmission device (T1) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

 --The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end
20 rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), and the output/input end rotation shaft (S1025) at the other end of the rotational electric machine mainly served as motor function (EM102) is combined with the rotation shaft (S1026);

 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is
25 combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device
30 (BK101) is fixed in a housing (H100), and through controlling the

controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026);

10 The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power

generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively
5 regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the
10 electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel
15 jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control
20 of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control
25 commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to
30 output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

5 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

10 --Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

15 FIG. 3 is a schematic view showing the rotational electric machine mainly served as power generator function (EM101) being installed between the engine (ICE100) and the controllable brake device (BK101) shown in FIG. 1, according to one embodiment of the present invention.

As shown in FIG. 3, it mainly consists of:

20 --Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

25 --Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

30 --Rotational electric machine mainly served as power generator

function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function from the inputting rotary mechanical kinetic energy, and also having the motor
 5 function for converting the input electric power into mechanical rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or
 10 through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

15 -- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action
 20 sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);

--The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined to the output/input end rotation shaft (S1051) of the rotational electric machine
 25 mainly served as power generator function (EM101);

--The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), and the output/input end rotation shaft (S1025)
 30 at the other end of the rotational electric machine mainly served as motor

function (EM102) is combined with the rotation shaft (S1026) for serving as the output/input end;

- 5 --The output/input end rotation shaft (S1011) of the engine (ICE100) is combined with the output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101) is combined with the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101);
- 10 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);
- 30

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless
5 DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical
10 switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a
15 power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power
20 or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an
25 electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

30 --Ignition device (ING101): which is constituted by the

electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

5 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen
10 containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

 --Drive electric circuit unit (ECU101): which is constituted by
15 electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator
20 function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the
25 engine operation control device (ICEC101);

 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

 --Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to
30 control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted
5 by electromechanical or electronic units and control mechanisms.

FIG. 4 is a schematic view showing the rotational electric machine mainly served as power generator function (EM101) being installed between the first transmission device (T1) and the controllable brake device (BK101) shown in FIG. 2, according to one embodiment of the
10 present invention.

As shown in FIG. 4, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine
15 and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric
20 power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

--Rotational electric machine mainly served as power generator function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a
25 transmission unit, mainly having the power generator function from the inputting rotary mechanical kinetic energy, and also having the motor function for converting the input electric power into mechanical rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel
30 (W101) and an output wheel (W102) and at least an epicyclic wheel

(W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being
 5 combined with the housing (H100);

-- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
 10 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);

--First transmission device (T1): which is constituted by the
 15 automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the
 20 hydraulic transmission device;

--The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined to the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other
 25 output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1012) of the first transmission device (T1), and the other output/input end rotation shaft (S1013) of the first transmission device (T1) is combined with the output/input end rotation
 30 shaft (S1011) of the engine (ICE100);

--The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), and the output/input end rotation shaft (S1025) at the other end of the rotational electric machine mainly served as motor function (EM102) is combined with the rotation shaft (S1026) for serving as the output/input end;

--The output/input end rotation shaft (S1011) of the engine (ICE100) is combined with the output/input end rotation shaft (S1013) of the first transmission device (T1), the other output/input end rotation shaft (S1012) of the first transmission device (T1) is combined with the output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101) is combined with rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example

controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate
 5 as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting
 10 devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101),
 15 for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable
 20 secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC
 25 power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally
 30 installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

5 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

10 --Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

15 FIG. 5 is a schematic structural view showing the present invention being structured by the engine (ICE100) and a transmission unit (T200) and the epicyclic gear set (EG101) and a controllable brake device (BK102), the output wheel (W102) of the epicyclic gear set (EG101) and the output/input end of the rotation shaft (S102) being combined with the
20 rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) being provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) being used to drive the input end of the transmission unit (T200), and the output end of the
25 transmission unit (T200) being installed with a rotation shaft (S110), according to one embodiment of the present invention.

As shown in FIG. 5, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an
30 internal combustion engine, external combustion engine, Sterling engine

and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission
 5 unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel
 10 (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being
 15 combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
 20 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or
 25 variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the
 30 output/input end rotation shaft (S1011) of the engine (ICE100), the other

end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the controllable brake device (BK102) and
 5 combined with the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation
 10 shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

--Through controlling the controllable brake device (BK102) to
 15 perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and
 20 the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting
 25 devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101),
 30 for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable
5 secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC
10 power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally
15 installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the
20 power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for
25 igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the
30 fuel jetting mechanism with respect to the opening degree of throttle, the

temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel
5 required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as
10 the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by
15 electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the
20 inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations
25 of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

FIG. 6 is a schematic view showing the structure in FIG. 5 in which the input wheel (W101) of the epicyclic gear set (EG101) being combined
30 with the rotation shaft (S101) and combined with the rotation shaft

(S1011) of the engine (ICE100), the rotation shaft (S101) being combined to an action side of a controllable brake device (BK103), and the other action end of the controllable brake device (BK103) being fixed in the housing (H100), the output/input end of the rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) being combined with a rocker arm (A111) of a planetary gear set (T300), an outer annular wheel (W113) of the planetary gear set (T300) being fixed in the housing (H100), a sun wheel (W111) of the planetary gear set (T300) being combined with the rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) being provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) being provided for driving the input end of the transmission unit (T200), according to one embodiment of the present invention.

As shown in FIG. 6, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft

(S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake
 5 device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is
 10 fixed in the housing (H100);

--Controllable brake device (BK103): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for
 15 engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S101), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or
 20 variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

-- Planetary gear set (T300): which is constituted by a sun wheel
 25 (W111), a planetary wheel (W112), an outer annular wheel (W113) composed of friction wheels or gears, and a shell fixed in the housing (H100), wherein the outer annular wheel (W113) is fixed in the shell then fixed in the housing or directly fixed in the housing, the planetary wheel (W112) is combined with the rocker arm (A111) and connected to the
 30 rotation shaft (S102), and the sun wheel (W111) is connected to the

output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102);

--The output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action
 5 side of the controllable brake device (BK102), the other action side of the controllable brake device (BK102) is fixed in the housing (H100), and the other end of the rotation shaft (S102) is connected to the rocker arm (A111) driven by the planetary wheel (W112) of the planetary gear set (T300);

10 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is connected to the rocker arm (A101) and connected to the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101) and drives the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end
 15 rotation shaft (S1032) of the transmission unit (T200) is provided for driving the rotation shaft (S110);

--The output/input end rotation shaft (S1011) of the engine (ICE100) is connected to the rotation shaft (S101), the rotation shaft (S101) is connected to the input wheel (W101) of the epicyclic gear set (EG101), as
 20 well as connected to an action side of the controllable brake device (BK103), and the other action side of the controllable brake device (BK103) is fixed in the housing (H100);

--Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK103) to perform brake
 25 locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) is enabled to be controlled; for example controlling the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation
 30 shaft (AS101) or between the rotation shaft (S102) and the sleeve type

rotation shaft (AS101), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to drive the rotation shaft (S110).

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the

power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for
5 igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the
10 fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

15 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational
20 electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

25 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable
30 secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control
5 command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

FIG. 7 is a schematic view showing the rotational electric machine
10 mainly served as motor function (EM102) shown in FIG. 5 being installed at one end of the output/input end rotation shaft (S110) of the transmission unit (T200).

As shown in FIG. 7, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power
15 source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or
20 constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel
25 (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type
30 rotation shaft (AS101) and a bearing, and installed with a shell for being

combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
5 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic,
10 manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the
15 output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set
20 (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type
25 rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the
30 output/input end rotation shaft (S110);

--One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the other end of the rotation shaft (S110) is served as an output/input end;

5 --Through controlling the controllable brake device (BK102) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the
10 rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110).

The above-mentioned system includes a part or all of the following
15 operation and control devices and the peripheral operation assisting devices including:

 --Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power
20 of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

 --Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

25 --Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

30 --Power generator (G101): which is constituted by an AC or DC

power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as

the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

5 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

10 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

 --Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

15 --Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

20 FIG. 8 is a schematic view showing the structure shown in FIG. 7 in which an epicyclic gear set (EG201) and a controllable brake device (BK104) being installed between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102).

 As shown in FIG. 8, it mainly consists of:

25 --Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

30 --Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or

constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

5 -- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft
10 (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

 -- Epicyclic gear set (EG201): which is constituted by an input wheel (W201) and an output wheel (W202) and at least an epicyclic wheel
15 (W203), and including through bevel gears engaging with each other, or through bevel friction wheel mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S201), the rotation shaft (S202), the rocker arm (A201), the sleeve type rotation shaft (AS201) and a bearing, and installed with a shell for being
20 combined with the housing (H100);

 --Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for
25 engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

 -- Controllable brake device (BK104): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic
30 force or pneumatic force or electromagnetic force, and having two

controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS201) or the rocker arm (A201), and the other action side is fixed in the housing (H100);

5 --Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic
10 type transmission gear set, the CVT, or the hydraulic transmission device;

 --One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft
15 (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is
20 combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft
25 (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

 --One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S202) combined with the output wheel (W202) of the epicyclic gear set (EG201), the other output/input end
30 rotation shaft (S201) combined with the input wheel (W201) of the

epicyclic gear set (EG201) is combined with the output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W203) of the epicyclic gear set (EG201) is provided for driving the rocker arm (A201) and the sleeve
 5 type rotation shaft (AS201), the sleeve type rotate shaft (AS201) rotates on the rotation shaft (S201) and is provided for connecting to an action side of the controllable brake device (BK104), the other action side of the controllable brake device (BK104) is fixed in the housing (H100), and the other end of the rotation shaft (S110) is served as an output/input end;

10 --Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK104) to perform brake locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) is enabled to be controlled; for example
 15 controlling the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) or between the rotation shaft (S201) and the rotation shaft (S202), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to
 20 drive the rotation shaft (S110).

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless
 25 DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical
 30 switch unit or solid state electronic switch unit, for controlling the start

battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control

of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by
 5 electromechanical or solid state electronic units for receiving the control
 commands of a central control unit (CCU101) to drive the rotational
 electric machine mainly served as motor function (EM102) to operate as
 the motor function, or to control the rotational electric machine mainly
 served as motor function (EM102) to operate as the power generator
 10 function, so as to charge an electricity storage device (ESD101) or to
 output the electric power to other loads;

--Central control unit (CCU101): which is constituted by
 electromechanical or solid state electronic units, for outputting the control
 command, so as to control the drive electric circuit unit (ECU101) and the
 15 engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable
 secondary battery or the capacitor or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the
 inputted signals for controlling the central control unit (CCU101) so as to
 20 control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control
 command of the central control unit (CCU101) to control the operations
 of actuating, stopping, regulating rotation speed, increasing/decreasing
 fuel jetted into engine and the ignition of the engine (ICE100); constituted
 25 by electromechanical or electronic units and control mechanisms.

FIG. 9 is a schematic view showing the structure shown in FIG. 7 in
 which the rotational electric machine mainly served as power generator
 function (EM101) being installed between the engine (ICE100) and the
 rotation shaft (S101) combined with the input wheel (W101) of the
 30 epicyclic gear set (EG101).

As shown in FIG. 9, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine
5 and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric
10 power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

--Rotational electric machine mainly served as power generator function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a
15 transmission unit, mainly having the power generator function for inputting the rotary mechanical kinetic energy, as well as having the motor function for converting the input electric power into the mechanical rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel
20 (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type
25 rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
30 controllable action sides for the operations of a brake locking state for

engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), the rotation shaft (S1052) at the other end of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

--One end of the rotation shaft (S110) is combined with the

output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the other end of the rotation shaft (S110) is served as an output/input end;

--The rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--Through controlling the controllable brake device (BK102) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100).

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator

function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel

jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen
 5 containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by
 10 electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric
 15 machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by
 20 electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery or the capacitor or the super capacitor;

25 --Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations
 30 of actuating, stopping, regulating rotation speed, increasing/decreasing

fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

FIG. 10 is a schematic view showing the structure shown in FIG. 9 in which the epicyclic gear set (EG201) and the controllable brake device
 5 (BK104) being installed between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102).

As shown in FIG. 10, it mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power
 10 source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or
 15 constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

--Rotational electric machine mainly served as power generator
 20 function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function for inputting the rotary mechanical kinetic energy, as well as having the motor function for converting the input electric power into the mechanical rotary
 25 kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions
 30 to form an epicyclic gear set function, and structured by the rotation shaft

(S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Epicyclic gear set (EG201): which is constituted by an input wheel
 5 (W201) and an output wheel (W202) and at least an epicyclic wheel (W203), and including through bevel gears engaging with each other, or through bevel friction wheel mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S201), the rotation shaft (S202), the rocker arm (A201), the sleeve type
 10 rotation shaft (AS201) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two
 15 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

-- Controllable brake device (BK104): which is constituted by a brake
 20 device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS201) or the rocker
 25 arm (A201), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and
 30 chain wheels, or a planetary type transmission gear set, or an epicyclic

type transmission gear set, the CVT, or the hydraulic transmission device

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), the rotation shaft
 5 (S1052) at the other end of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102)
 10 combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is
 15 combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft
 20 (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

--One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S202) combined with the output wheel (W202) of the epicyclic gear set (EG201), the other output/input end
 25 rotation shaft (S201) combined with the input wheel (W201) of the epicyclic gear set (EG201) is combined with the output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W203) of the epicyclic gear set (EG201) is provided for driving the rocker arm (A201) and the sleeve
 30 type rotation shaft (AS201), the sleeve type rotate shaft (AS201) rotates

on the rotation shaft (S201), and the sleeve type rotate shaft (AS201) is connected to an action side of the controllable brake device (BK104), the other action side of the controllable brake device (BK104) is fixed in the housing (H100), and the other end of the rotation shaft (S110) is served as
 5 an output/input end;

--The rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end
 10 rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK104) to perform brake
 15 locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) are able to be controlled; for example controlling the operations of connecting for transmission or
 20 releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) or between the rotation shaft (S201) and the rotation shaft (S202), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to drive to the rotation shaft (S110), or the engine
 25 (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100).

30 The above-mentioned system includes a part or all of the following

operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator
5 function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start
10 battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external
15 electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric
20 power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively
25 regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the
30 electromechanical circuit component or the solid state electronic circuit

component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel
 5 jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control
 10 of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control
 15 commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as power generator function (EM101) and the
 20 rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control
 25 command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery or the capacitor or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the
 30 inputted signals for controlling the central control unit (CCU101) so as to

control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing
5 fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

CLAIMS

1. A hybrid power train having epicyclic type clutch device, in which the controllable brake device is used to control the power train having the epicyclic gear set serving as a clutch device, which can be widely applied in a hybrid power train with dual rotary kinetic power devices composed of an engine (ICE100) and a rotational electric machine mainly served as motor function (EM102), or a hybrid power train with triple rotary kinetic power sources composed of an engine (ICE100) and a rotational electric machine mainly served as power generator function (EM101) and a rotational electric machine mainly served as motor function (EM102), wherein the structural configuration of each rotary kinetic power device combining with a transmission device includes a coaxial in-series structure or a multiple axial in-parallel structure for satisfying the requirement of applied space;

the structure includes that a rocker arm (A101) and a sleeve type rotation shaft (AS101) driven by an engine (ICE100) and an epicyclic wheel (W103) of an epicyclic gear set (EG101) are combined with a controllable brake device (BK101), and an input wheel (W102) of the epicyclic gear set (EG101) and an output/input end of a rotation shaft (S102) are combined with a rotational electric machine mainly served as motor function (EM102) and an output/input end rotation shaft (S1026), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a

transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

- 5 -- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by
 - 10 the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);
 - Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic
 - 15 force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing
 - 20 (H100);
 - One end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the other end of the rotation shaft (S101) is combined with an output/input end rotation shaft (S1011) of the engine (ICE100), and the rotation shaft (S102)
 - 25 combined with the output wheel (W102) of the epicyclic gear set (EG101) is served as an output/input end for being combined with an output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), the other output/input end rotation shaft (S1025) of the rotational electric
 - 30 machine mainly served as motor function (EM102) is combined with a

rotation shaft (S1026) for being served as an output/input end;

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable

secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

5 --Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the
10 power generator function, the mentioned power generator can be optionally installed;

 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively
15 regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic
20 circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the
25 fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device
30 (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

2. A hybrid power train having epicyclic type clutch device as claimed in claim 1, wherein it further includes the structure that a first transmission device (T1) is installed between the engine (ICE100) and the controllable brake device (BK101), and the input wheel (W102) of the epicyclic gear set (EG101) and the output/input end of the rotation

shaft (S102) are combined with the rotational electric machine mainly served as motor function (EM102) and the output/input end rotation shaft (S1026), which mainly consists of:

- 5 --Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;
- 10 --Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;
- 15 -- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);
- 20 -- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);
- 30

--First transmission device (T1): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1012) of the first transmission device (T1), and the output/input end rotation shaft (S1013) at the other end of the first transmission device (T1) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), and the output/input end rotation shaft (S1025) at the other end of the rotational electric machine mainly served as motor function (EM102) is combined with the rotation shaft (S1026);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101)

and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of
 5 the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

10 --Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a
 15 transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable
 20 secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power
 25 generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be
 30 optionally installed;

- 5 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;
- 10 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);
- 15 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);
- 20 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;
- 25 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;
- 30 --Central control unit (CCU101): which is constituted by

electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

5 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

10 --Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

15 3. A hybrid power train having epicyclic type clutch device as claimed in claim 1, wherein it further includes the structure that the rotational electric machine mainly served as power generator function (EM101) is installed between the engine (ICE100) and the controllable brake device (BK101), which mainly consists of:

20 --Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

25 --Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the
30 rotary kinetic energy;

- Rotational electric machine mainly served as power generator function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function from the inputting rotary mechanical kinetic energy, and also having the motor function for converting the input electric power into mechanical rotary kinetic energy;
- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);
- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);
- The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined to the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101);
- The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1024) of the rotational electric machine mainly served

as motor function (EM102), and the output/input end rotation shaft (S1025) at the other end of the rotational electric machine mainly served as motor function (EM102) is combined with the rotation shaft (S1026) for serving as the output/input end;

- 5 --The output/input end rotation shaft (S1011) of the engine (ICE100) is combined with the output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function
- 10 (EM101) is combined with the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101);
- The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101)
- 15 rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform
- 20 brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function
- 25 (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026), or the engine (ICE100) drives the rotational
- 30 electric machine mainly served as power generator function (EM101)

to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);

5 The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively

regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

5 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

10 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of
15 throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

20 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric
25 machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the
30 control command, so as to control the drive electric circuit unit

(ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

5 --Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the
10 engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

4. A hybrid power train having epicyclic type clutch device as claimed in claim 2, wherein it further includes the structure that the rotational
15 electric machine mainly served as power generator function (EM101) is installed between the first transmission device (T1) and the controllable brake device (BK101), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an
20 internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a
25 transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

--Rotational electric machine mainly served as power generator
30 function (EM101): which is constituted by a rotational electric

machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function from the inputting rotary mechanical kinetic energy, and also having the motor function for converting the input electric power into mechanical rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Controllable brake device (BK101): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS101) or the rocker arm (A101), and the other action side is fixed in the housing (H100);

--First transmission device (T1): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--The other end of the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined to the

output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1012) of the first transmission device (T1), and the other output/input end rotation shaft (S1013) of the first transmission device (T1) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--The rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102), and the output/input end rotation shaft (S1025) at the other end of the rotational electric machine mainly served as motor function (EM102) is combined with the rotation shaft (S1026) for serving as the output/input end;

--The output/input end rotation shaft (S1011) of the engine (ICE100) is combined with the output/input end rotation shaft (S1013) of the first transmission device (T1), the other output/input end rotation shaft (S1012) of the first transmission device (T1) is combined with the output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101) is combined with rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), the sleeve type rotation shaft (AS101) or the rocker arm (A101) is combined to an action side of the

controllable brake device (BK101), the other action side of the controllable brake device (BK101) is fixed in a housing (H100), and through controlling the controllable brake device (BK101) to perform brake locking or releasing, the operations of connecting for
 5 transmission or releasing functions between the rotation shaft (S101) and the rotation shaft (S102) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor
 10 function (EM102) and the rotation shaft (S1026); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S1026), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101)
 15 to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the
 25 electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start
 30 battery (SB101) to supply electricity to the start motor (SM101);

- 5 --Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;
- 10 --Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;
- 15 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;
- 20 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);
- 25 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is
- 30 subjected to the control of the engine operation control device

(ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

5 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the
10 rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

15 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable
20 secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

25 --Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

30 5. A hybrid power train having epicyclic type clutch device as claimed in

claim 1, wherein it further structured by the engine (ICE100) and a transmission unit (T200) and the epicyclic gear set (EG101) and a controllable brake device (BK102), and the output wheel (W102) of the epicyclic gear set (EG101) and the output/input end of the rotation shaft (S102) are combined with the rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) is provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) is used to drive the input end of the transmission unit (T200), and the output end of the transmission unit (T200) is installed with a rotation shaft (S110), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and

installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two

5 controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic,

10 manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic

15 transmission device;

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation

20 shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with the controllable brake device (BK102) and combined with the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101)

25 and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200)

30 is provided for driving the output/input end rotation shaft (S110);

--Through controlling the controllable brake device (BK102) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric

power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

5 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101)
10 and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an
15 engine operation control device (ICEC101);

--Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of
20 throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel
25 required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102)
30 to operate as the motor function, or to control the rotational electric

machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

5 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

10 --Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

6. A hybrid power train having epicyclic type clutch device as claimed in
 20 claim 5, wherein it further includes the structure that the input wheel (W101) of the epicyclic gear set (EG101) is combined with the rotation shaft (S101) and combined with the rotation shaft (S1011) of the engine (ICE100), the rotation shaft (S101) is combined to an action side of a controllable brake device (BK103), and the other action end
 25 of the controllable brake device (BK103) is fixed in the housing (H100), the output/input end of the rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined with a rocker arm (A111) of a planetary gear set (T300), an outer annular wheel (W113) of the planetary gear set (T300) is fixed in
 30 the housing (H100), a sun wheel (W111) of the planetary gear set

(T300) is combined with the rotational electric machine mainly served as motor function (EM102), the epicyclic wheel (W103) of the epicyclic gear set (EG101) is provided for driving the rocker arm (A101) and the sleeve type rotation shaft (AS101), and the sleeve type rotation shaft (AS101) is provided for driving the input end of the transmission unit (T200), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the

action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Controllable brake device (BK103): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S101), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

-- Planetary gear set (T300): which is constituted by a sun wheel (W111), a planetary wheel (W112), an outer annular wheel (W113) composed of friction wheels or gears, and a shell fixed in the housing (H100), wherein the outer annular wheel (W113) is fixed in the shell then fixed in the housing or directly fixed in the housing, the planetary wheel (W112) is combined with the rocker arm (A111) and connected to the rotation shaft (S102), and the sun wheel (W111) is connected to the output/input end rotation shaft (S1024) of the rotational electric machine mainly served as motor function (EM102);

--The output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), the other action side of the controllable brake device (BK102) is fixed in the housing (H100), and the other end of the rotation shaft (S102) is connected to

the rocker arm (A111) driven by the planetary wheel (W112) of the planetary gear set (T300);

5 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is connected to the rocker arm (A101) and connected to the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101) and drives the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the rotation shaft (S110);

10 --The output/input end rotation shaft (S1011) of the engine (ICE100) is connected to the rotation shaft (S101), the rotation shaft (S101) is connected to the input wheel (W101) of the epicyclic gear set (EG101), as well as connected to an action side of the controllable brake device (BK103), and the other action side of the controllable brake device (BK103) is fixed in the housing (H100);

--Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK103) to perform brake locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) is enabled to be controlled; for example controlling the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) or between the rotation shaft (S102) and the sleeve type rotation shaft (AS101), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to drive the rotation shaft (S110);

30 The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

--Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

--Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two

components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

5 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device
10 (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

--Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the
15 rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device
20 (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

25 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

30 --Engine operation control device (ICEC101): receiving the control

command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

7. A hybrid power train having epicyclic type clutch device as claimed in claim 5, wherein it further includes the structure that the rotational electric machine mainly served as motor function (EM102) is installed at one end of the output/input end rotation shaft (S110) of the transmission unit (T200), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake

device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the

5 action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission

10 gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the

15 output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable

20 brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101)

25 rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

30 --One end of the rotation shaft (S110) is combined with the

output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the other end of the rotation shaft (S110) is served as an output/input end;

5 --Through controlling the controllable brake device (BK102) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor
10 function (EM102) and the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110);

The above-mentioned system includes a part or all of the
15 following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the
20 electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start
25 battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the
30 external electric power for charging;

- 5 --Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;
- 10 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;
- 15 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);
- 20 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is
- 25 subjected to the control of the engine operation control device (ICEC101);
- Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;
- 30 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the

- control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;
- 5 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);
- 10 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery, or the capacitor, or the super capacitor;
- Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as
- 15 to control the hybrid power train having epicyclic type clutch device;
- Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the
- 20 engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.
8. A hybrid power train having epicyclic type clutch device as claimed in claim 7, wherein it further includes the structure that an epicyclic gear set (EG201) and a controllable brake device (BK104) are installed
- 25 between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102), which mainly consists of:
- Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an
- 30 internal combustion engine, external combustion engine, Sterling

engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Epicyclic gear set (EG201): which is constituted by an input wheel (W201) and an output wheel (W202) and at least an epicyclic wheel (W203), and including through bevel gears engaging with each other, or through bevel friction wheel mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S201), the rotation shaft (S202), the rocker arm (A201), the sleeve type rotation shaft (AS201) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other

action side is fixed in the housing (H100);

5 -- Controllable brake device (BK104): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS201) or the rocker arm (A201), and the other action side is fixed in the housing (H100);

10 --Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or
15 an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel
20 (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

25 --The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of
30 the transmission unit (T200), and the other output/input end rotation

shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

--One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S202) combined with the output wheel (W202) of the epicyclic gear set (EG201), the other output/input end rotation shaft (S201) combined with the input wheel (W201) of the epicyclic gear set (EG201) is combined with the output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W203) of the epicyclic gear set (EG201) is provided for driving the rocker arm (A201) and the sleeve type rotation shaft (AS201), the sleeve type rotate shaft (AS201) rotates on the rotation shaft (S201) and is provided for connecting to an action side of the controllable brake device (BK104), the other action side of the controllable brake device (BK104) is fixed in the housing (H100), and the other end of the rotation shaft (S110) is served as an output/input end;

--Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK104) to perform brake locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) is enabled to be controlled; for example controlling the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) or between the rotation shaft (S201) and the rotation shaft (S202), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to drive the rotation shaft (S110);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation

assisting devices including:

- 5 --Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;
- 10 --Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);
- 15 --Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;
- 20 --Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;
- 25 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;
- 30 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic

circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

5 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is
10 subjected to the control of the engine operation control device (ICEC101);

--Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;

15 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as motor function (EM102) to operate as the
20 power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit
25 (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery or the capacitor or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as
30 to control the hybrid power train having epicyclic type clutch device;

- Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.
- 5
9. A hybrid power train having epicyclic type clutch device as claimed in claim 7, wherein it further includes the structure that the rotational electric machine mainly served as power generator function (EM101) is installed between the engine (ICE100) and the rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101), which mainly consists of:
- 10
- Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling engine and turbine engine;
- 15
- Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;
- 20
- Rotational electric machine mainly served as power generator function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function for inputting the rotary mechanical kinetic energy, as well as having the motor function for converting the input electric power into the mechanical rotary kinetic energy;
- 25
- 30

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device;

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), the rotation shaft (S1052) at the other end of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is combined with the input wheel (W101) of the epicyclic gear set

(EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other action side of the controllable brake device (BK102) is fixed in the housing (H100);

--The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101) rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);

--One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the other end of the rotation shaft (S110) is served as an output/input end;

--The rotation shaft (S101) combined with the input wheel (W101) of the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--Through controlling the controllable brake device (BK102) to perform brake locking or releasing, the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) are enabled to be controlled, so as to further control the operation relation between the engine (ICE100), the rotational electric machine mainly served as power

generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110); for example controlling one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) to drive the rotation shaft (S110), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);

The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

--Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

--Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric

power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

- 5 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;
- 10 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);
- 15 --Fuel control device (FC101): which is constituted including a fuel jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);
- 20 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;
- 25 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor
- 30

function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;

--Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);

--Electricity storage device (ESD101): constituted by the rechargeable secondary battery or the capacitor or the super capacitor;

--Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;

--Engine operation control device (ICEC101): receiving the control command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

10.A hybrid power train having epicyclic type clutch device as claimed in claim 9, wherein it further includes the structure that the epicyclic gear set (EG201) and the controllable brake device (BK104) are installed between one end of the output/input end rotation shaft (S110) of the transmission unit (T200) and the rotational electric machine mainly served as motor function (EM102), which mainly consists of:

--Engine (ICE100): which is constituted by a rotary kinetic power source capable of generating rotary kinetic power output, including an internal combustion engine, external combustion engine, Sterling

engine and turbine engine;

--Rotational electric machine mainly served as motor function (EM102): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combined with a transmission unit, mainly having the motor function for converting the input electric power into the rotary mechanical kinetic energy, as well as having the power generator function for reversely inputting the rotary kinetic energy;

--Rotational electric machine mainly served as power generator function (EM101): which is constituted by a rotational electric machine, or constituted by a rotational electric machine combining with a transmission unit, mainly having the power generator function for inputting the rotary mechanical kinetic energy, as well as having the motor function for converting the input electric power into the mechanical rotary kinetic energy;

-- Epicyclic gear set (EG101): which is constituted by an input wheel (W101) and an output wheel (W102) and at least an epicyclic wheel (W103), and including through bevel gears engaging with each other, or through bevel friction wheels mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S101), the rotation shaft (S102), the rocker arm (A101), the sleeve type rotation shaft (AS101) and a bearing, and installed with a shell for being combined with the housing (H100);

-- Epicyclic gear set (EG201): which is constituted by an input wheel (W201) and an output wheel (W202) and at least an epicyclic wheel (W203), and including through bevel gears engaging with each other, or through bevel friction wheel mutually performing friction transmissions to form an epicyclic gear set function, and structured by the rotation shaft (S201), the rotation shaft (S202), the rocker arm (A201), the sleeve type rotation shaft (AS201) and a bearing, and

installed with a shell for being combined with the housing (H100);

--Controllable brake device (BK102): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the rotation shaft (S102), and the other action side is fixed in the housing (H100);

-- Controllable brake device (BK104): which is constituted by a brake device controlled by a manual force or mechanical force or hydraulic force or pneumatic force or electromagnetic force, and having two controllable action sides for the operations of a brake locking state for engagement or a releasing state for separation, wherein one of the action sides is connected to the sleeve type rotation shaft (AS201) or the rocker arm (A201), and the other action side is fixed in the housing (H100);

--Transmission unit (T200): which is constituted by the automatic, manumatic, semi-automatic, or manual gear shifting device with fixed or variable speed ratios which is further structured by a transmission gear set composed of gears, friction wheels, pulleys and pulley belts, chains and chain wheels, or a planetary type transmission gear set, or an epicyclic type transmission gear set, the CVT, or the hydraulic transmission device

--One end of the rotation shaft (S101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), the rotation shaft (S1052) at the other end of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100), the other end of the rotation shaft (S101) is

- combined with the input wheel (W101) of the epicyclic gear set (EG101), the output/input end rotation shaft (S102) combined with the output wheel (W102) of the epicyclic gear set (EG101) is combined to an action side of the controllable brake device (BK102), and the other
- 5 action side of the controllable brake device (BK102) is fixed in the housing (H100);
- The epicyclic wheel (W103) of the epicyclic gear set (EG101) is combined with the rocker arm (A101) and combined with the sleeve type rotation shaft (AS101), the sleeve type rotation shaft (AS101)
- 10 rotates on the rotation shaft (S101), and the sleeve type rotation shaft (AS101) is used to drive the output/input end rotation shaft (S1031) of the transmission unit (T200), and the other output/input end rotation shaft (S1032) of the transmission unit (T200) is provided for driving the output/input end rotation shaft (S110);
- 15 --One end of the rotation shaft (S110) is combined with the output/input end rotation shaft (S202) combined with the output wheel (W202) of the epicyclic gear set (EG201), the other output/input end rotation shaft (S201) combined with the input wheel (W201) of the epicyclic gear set (EG201) is combined with the output/input end
- 20 rotation shaft (S1025) of the rotational electric machine mainly served as motor function (EM102), and the epicyclic wheel (W203) of the epicyclic gear set (EG201) is provided for driving the rocker arm (A201) and the sleeve type rotation shaft (AS201), the sleeve type rotate shaft (AS201) rotates on the rotation shaft (S201), and the sleeve
- 25 type rotate shaft (AS201) is connected to an action side of the controllable brake device (BK104), the other action side of the controllable brake device (BK104) is fixed in the housing (H100), and the other end of the rotation shaft (S110) is served as an output/input end;
- 30 --The rotation shaft (S101) combined with the input wheel (W101) of

the epicyclic gear set (EG101) is combined with the output/input end rotation shaft (S1051) of the rotational electric machine mainly served as power generator function (EM101), and the other output/input end rotation shaft (S1052) of the rotational electric machine mainly served as power generator function (EM101) is combined with the output/input end rotation shaft (S1011) of the engine (ICE100);

--Through controlling one or both of the controllable brake device (BK102) and the controllable brake device (BK104) to perform brake locking or releasing, the operation relation between the engine (ICE100), the rotational electric machine mainly served as power generator function (EM101), the rotational electric machine mainly served as motor function (EM102) and the rotation shaft (S110) are able to be controlled; for example controlling the operations of connecting for transmission or releasing functions between the rotation shaft (S101) and the sleeve type rotation shaft (AS101) or between the rotation shaft (S201) and the rotation shaft (S202), one or both of the engine (ICE100) and the rotational electric machine mainly served as motor function (EM102) is further controlled to drive to the rotation shaft (S110), or the engine (ICE100) drives the rotational electric machine mainly served as power generator function (EM101) to operate as the power generator function, or the rotational electric machine mainly served as power generator function (EM101) is operated as the motor function to actuate and drive the engine (ICE100);

25 The above-mentioned system includes a part or all of the following operation and control devices and the peripheral operation assisting devices including:

--Start motor (SM101): which is constituted by a brush or brushless DC or AC motor, or constituted by a start motor having power generator function, and through operating a start switch (SS101), the

electric power of a start battery (SB101) is controlled to drive the start motor (SM101), for linking the engine (ICE100) directly or via a transmission device;

5 --Start switch (SS101): which is constituted by an electromechanical switch unit or solid state electronic switch unit, for controlling the start battery (SB101) to supply electricity to the start motor (SM101);

--Start Battery (SB101): which is constituted by various rechargeable secondary batteries or super capacitors, for providing electric power to the start motor (SM101), and receiving the electric power generated by a power generator (G101) driven by the engine (ICE100) or the external electric power for charging;

10 --Power generator (G101): which is constituted by an AC or DC power generator, and directly linked by the engine or linked via a transmission device for respectively generating relative AC electric power or DC output after being rectified, or directly generating DC electric power for outputting; when the start motor is equipped with the power generator function, the mentioned power generator can be optionally installed;

15 --Regulation device (REG101): which is constituted by an electromechanical or solid state electronic circuit, for respectively regulating the electric power outputted by the power generator (G101) or the electric power outputted while the start motor being operated as the power generator function, so as to charge the start battery (SB101) and supply electric power to other loads;

20 --Ignition device (ING101): which is constituted by the electromechanical circuit component or the solid state electronic circuit component, or constituted through utilizing the two components, for igniting the engine to operate, and controlled by an engine operation control device (ICEC101);

25 --Fuel control device (FC101): which is constituted including a fuel

- jetting mechanism with opening/closing throttle function to control the fuel jetting width, and a control circuit device capable of controlling the fuel jetting mechanism with respect to the opening degree of throttle, the temperature of engine oil, the temperature of intake air, and the oxygen containment crankshaft (IP-ARB) signals, and is subjected to the control of the engine operation control device (ICEC101);
- 5 --Fuel tank (TANK101): a storage chamber for storing the fuel required by the engine;
- 10 --Drive electric circuit unit (ECU101): which is constituted by electromechanical or solid state electronic units for receiving the control commands of a central control unit (CCU101) to drive the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the motor function, or to control the rotational electric machine mainly served as power generator function (EM101) and the rotational electric machine mainly served as motor function (EM102) to operate as the power generator function, so as to charge an electricity storage device (ESD101) or to output the electric power to other loads;
- 15 --Central control unit (CCU101): which is constituted by electromechanical or solid state electronic units, for outputting the control command, so as to control the drive electric circuit unit (ECU101) and the engine operation control device (ICEC101);
- 20 --Electricity storage device (ESD101): constituted by the rechargeable secondary battery or the capacitor or the super capacitor;
- Operation interface (OP101): receiving the manual operations or the inputted signals for controlling the central control unit (CCU101) so as to control the hybrid power train having epicyclic type clutch device;
- 25 --Engine operation control device (ICEC101): receiving the control
- 30

command of the central control unit (CCU101) to control the operations of actuating, stopping, regulating rotation speed, increasing/decreasing fuel jetted into engine and the ignition of the engine (ICE100); constituted by electromechanical or electronic units and control mechanisms.

5

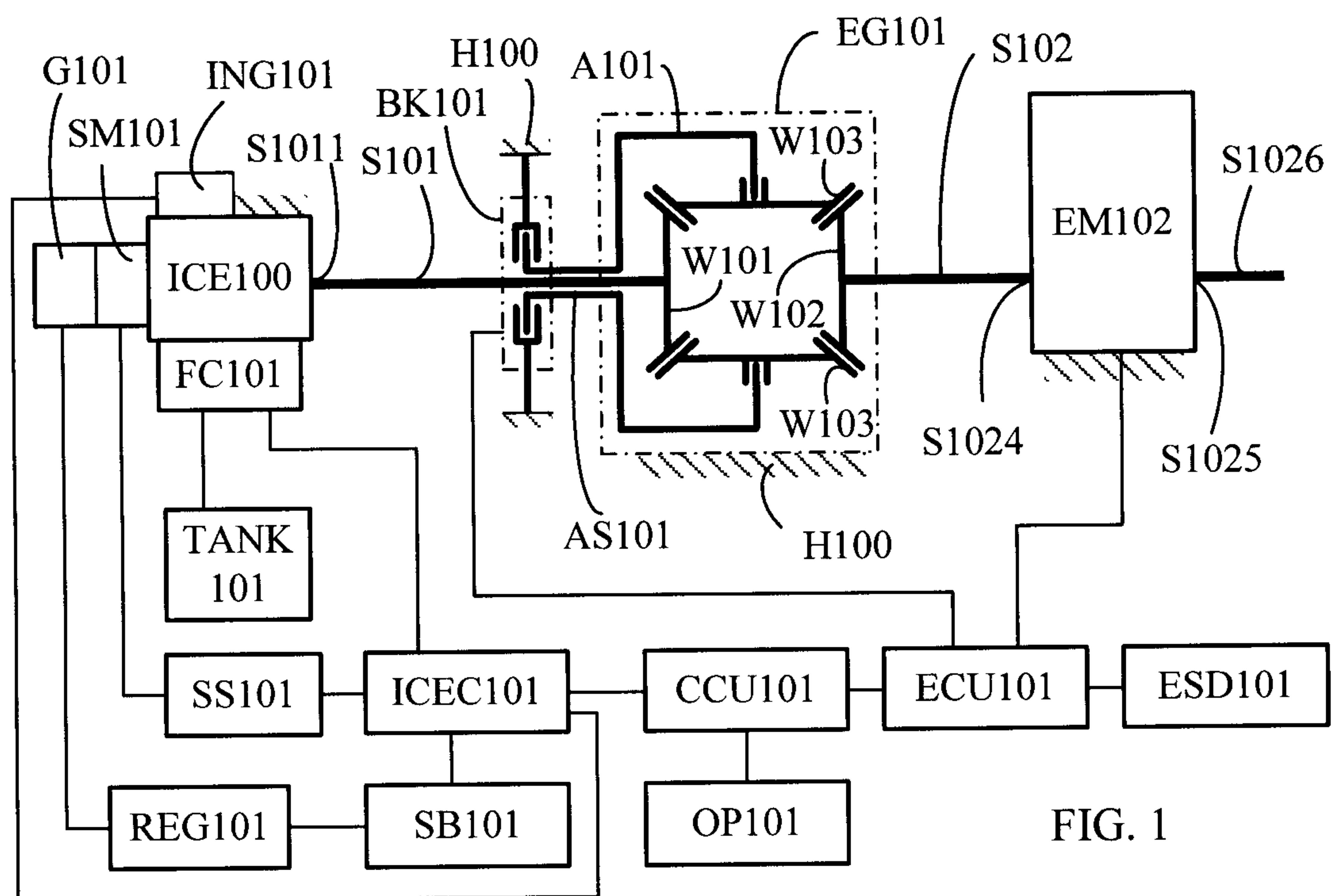


FIG. 1

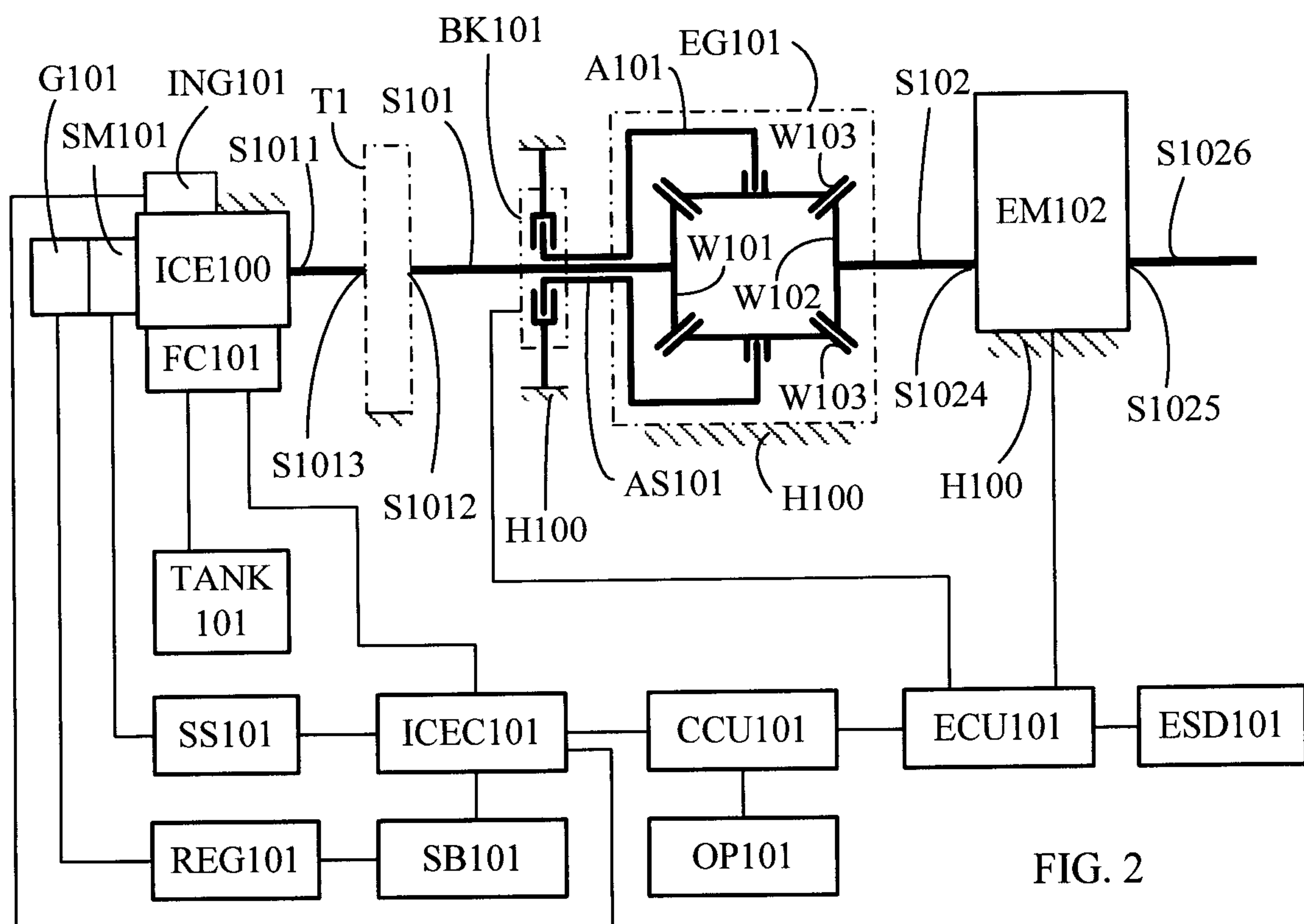


FIG. 2

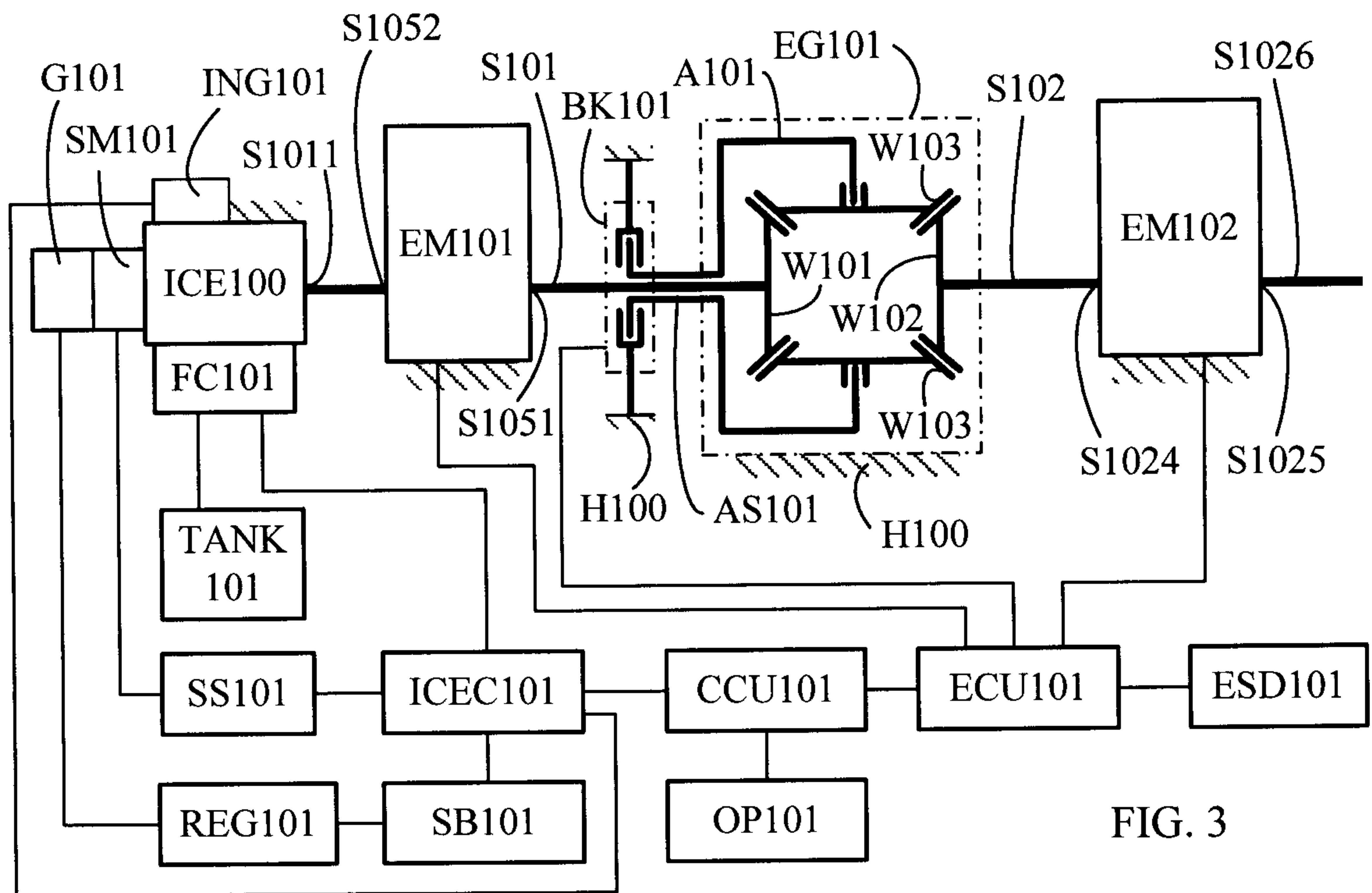


FIG. 3

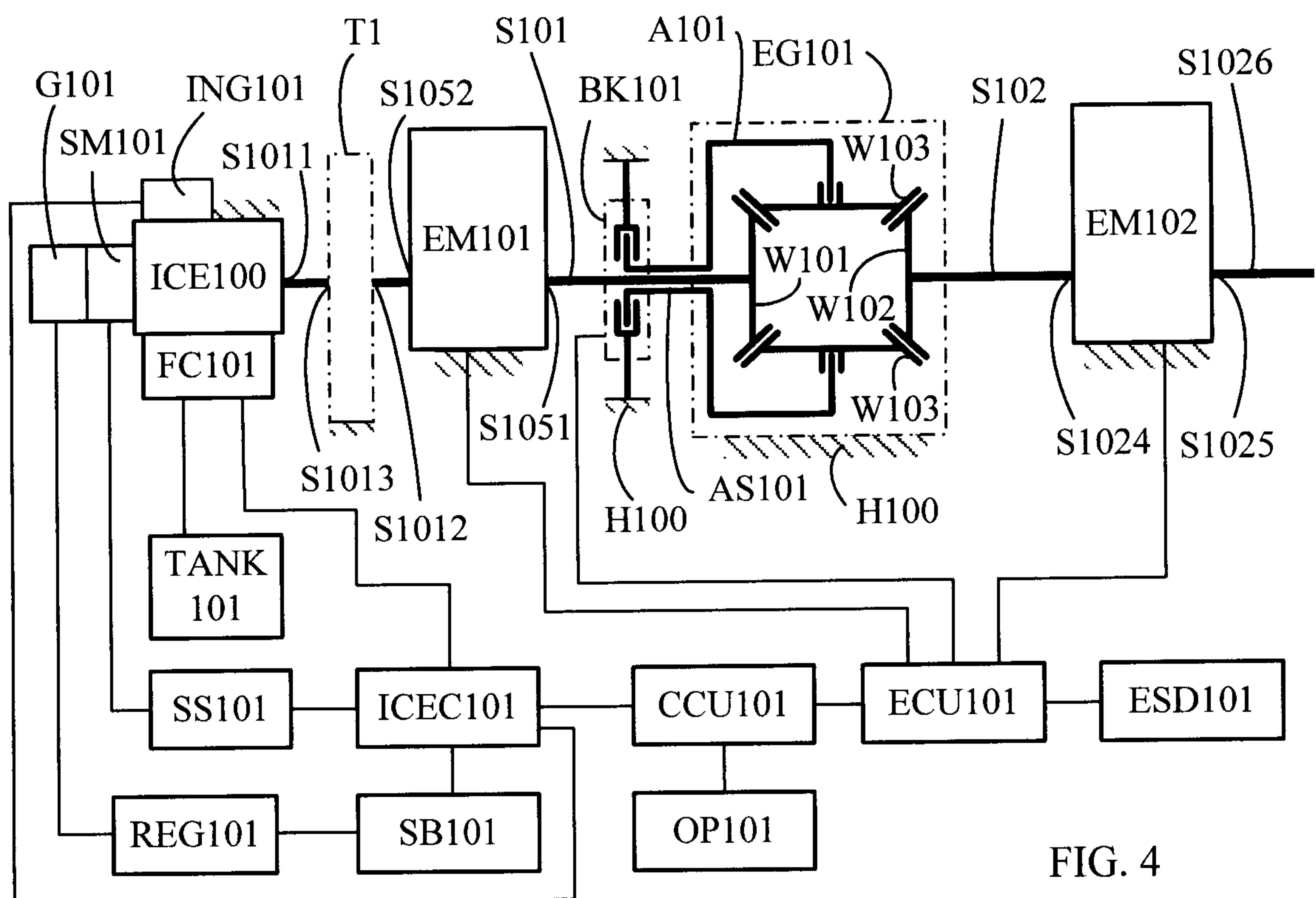


FIG. 4

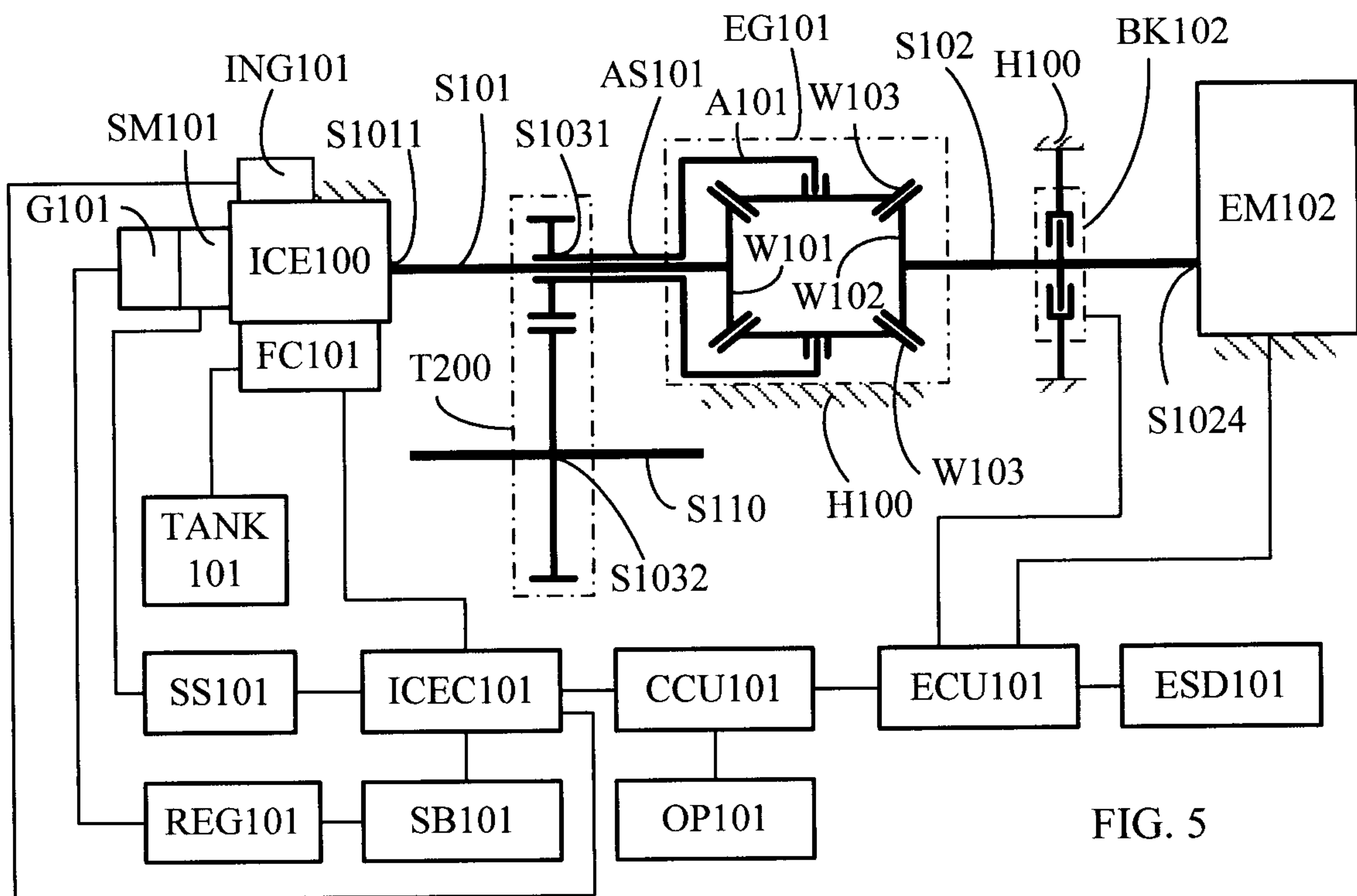


FIG. 5

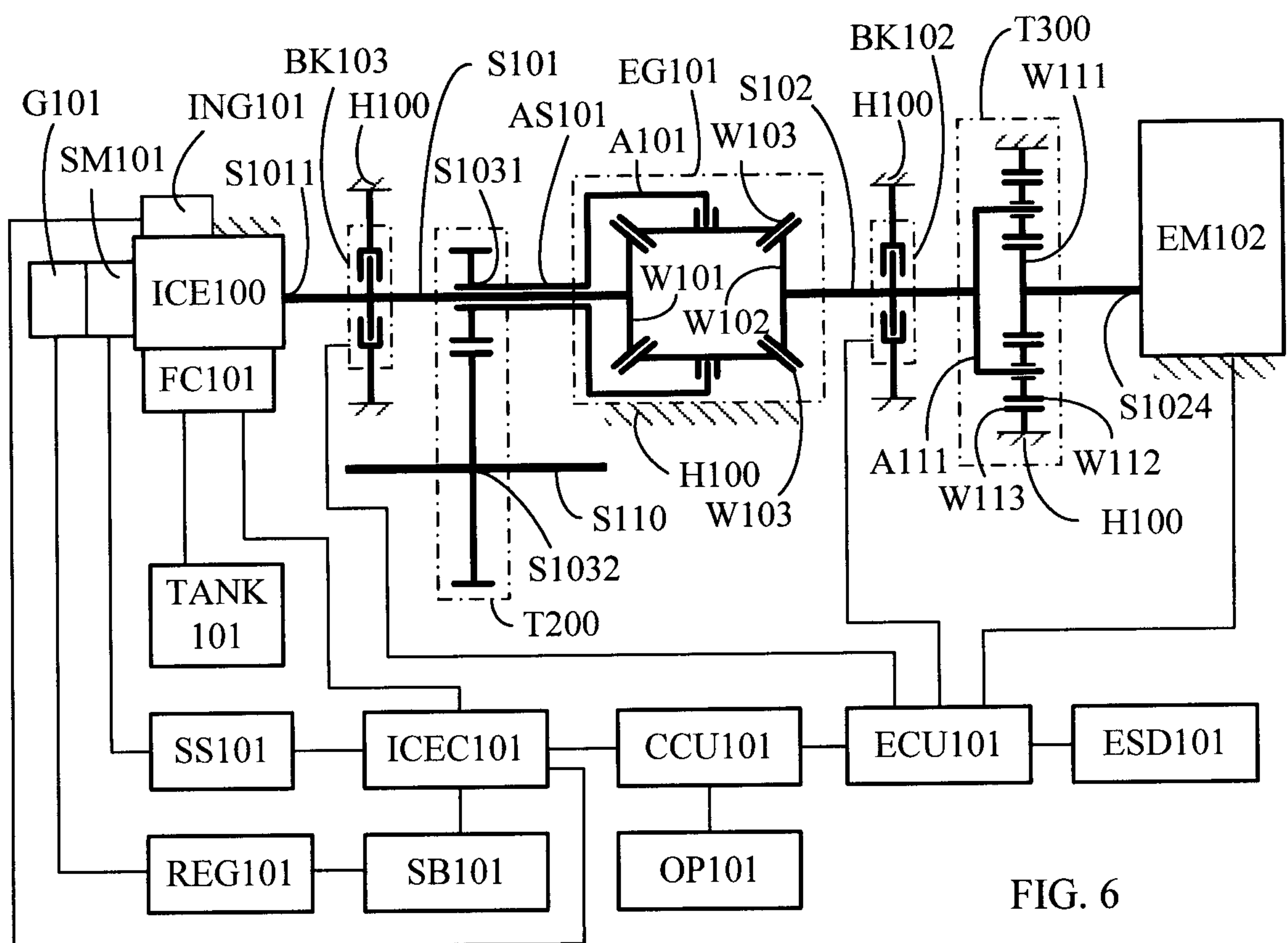


FIG. 6

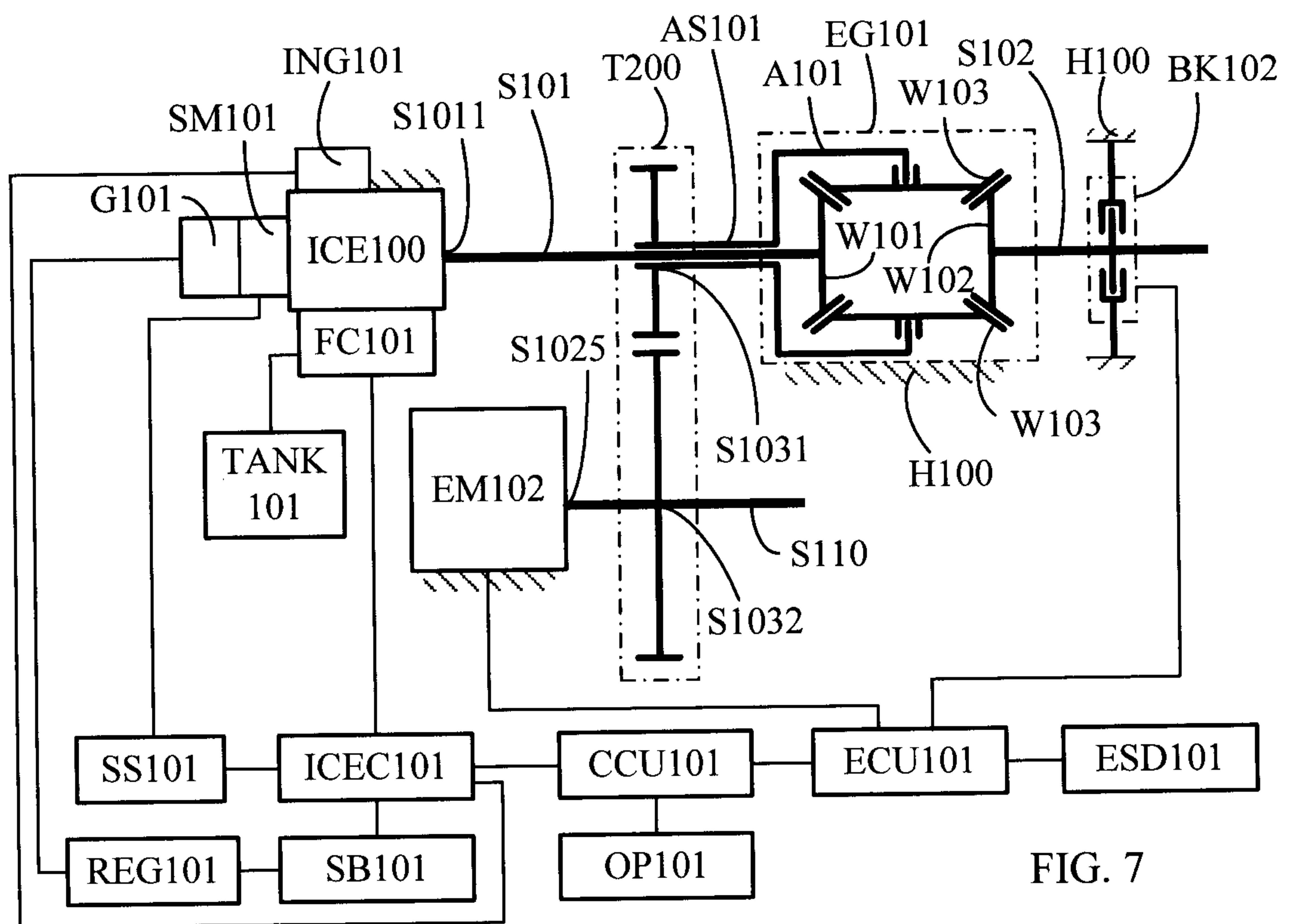


FIG. 7

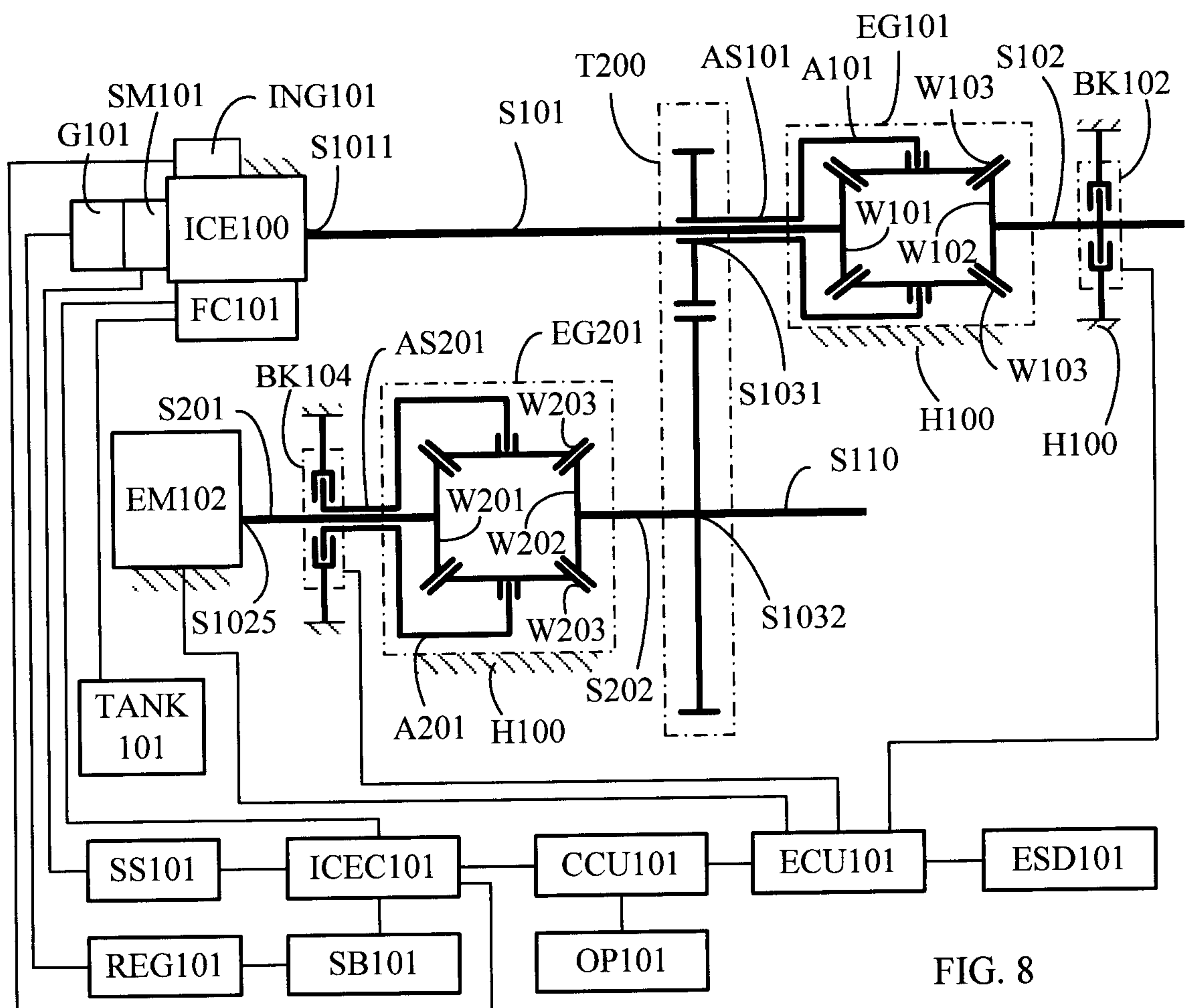


FIG. 8

FIG. 9

