IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of	:	
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Severinsky et al	:	Examiner: David Dunn
	:	
Serial No.: 10/382,577	:	Group Art Unit: 3616
	:	
Filed: March 7, 2003	:	Att.Dkt.:PAICE201.DIV
	:	

For: Hybrid Vehicles

Hon. Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

AMENDMENT

Sir:

In response to the Office Action mailed December 3, 2004, and setting a shortened statutory period for response to expire on March 3, 2005, kindly amend the above-identified Application as follows:

Amend the claims (claims 71 - 141 having been renumbered by the Examiner as claims 82 - 142, respectively) to appear as follows:

Claims 16 - 81 (canceled).

--82. (Amended) A hybrid vehicle, comprising:

an internal combustion engine controllably coupled to road wheels of said vehicle;

a first electric motor connected to said engine and operable to start the engine responsive to a control signal;

a second electric motor connected to road wheels of said vehicle, and operable as a motor, to apply torque to said wheels to propel said vehicle, and as a generator, for accepting torque from at least said wheels for generating current;

a battery, for providing current to said motors and accepting charging current from at least said second motor; and

a controller for controlling the flow of electrical and mechanical power between said engine, first and second motors, and wheels,

wherein said controller starts and operates said engine when torque produced by said engine ~~to propel the vehicle or~~ to propel the vehicle and/or to drive either one or both said electric motor(s) to charge said battery is at least equal to a setpoint (SP) above which said engine torque is efficiently produced, and wherein the torque produced by said engine when operated at said setpoint (SP)

is substantially less than the maximum torque output (MTO) of said engine.--

--83. (Amended) The vehicle of claim ~~81~~ 82, wherein said controller monitors patterns of vehicle operation over time and varies said setpoint SP accordingly.--

--84. (Amended) The vehicle of claim ~~81~~ 82, wherein said controller monitors the road load (RL) on the vehicle ~~RL~~ over time, and controls transition between propulsion of said vehicle by said motor(s) to propulsion by said engine responsive to RL reaching SP, such that said transition occurs only when RL > SP for at least a predetermined time, or when RL > SP2, wherein SP2 > SP.--

--85. (Amended) The vehicle of claim ~~83~~ 84, wherein said controller further controls transition from propulsion of said vehicle by said engine to propulsion by said motor(s) such that said transition occurs only when RL < SP for at least a predetermined time.--

--86. (Amended) The vehicle of claim ~~81~~ 82, wherein said setpoint SP may be varied by said controller as a function of engine speed.--

--87. (Amended) The vehicle of claim ~~81~~ 82, wherein said setpoint SP is at least approximately 30% of the maximum torque output of the engine when normally-aspirated (MTO).--

--88. (Amended) The vehicle of claim ~~81~~ 82, wherein said vehicle is operated in a plurality of operating modes responsive to the value for the road load (RL) and said setpoint SP, both expressed as percentages of the maximum torque output of the engine when normally-aspirated (MTO), and said operating modes include:

a low-load mode I, wherein said vehicle is propelled by torque provided by said second electric motor in response to energy supplied from said battery ~~bank~~, while RL < SP,

a highway cruising mode IV, wherein said vehicle is propelled by torque provided by said internal combustion engine, while SP < RL < MTO, and

an acceleration mode V, wherein said vehicle is propelled by torque provided by said internal combustion engine and by torque provided by either or both electric motor(s) in response to energy supplied from said battery ~~bank~~, while RL > MTO.--

--89. (Amended) The vehicle of claim ~~87~~ 88, wherein the combination of said engine and said first motor is disengaged from said wheels during operation in mode I and engaged during operation in modes IV and V.--

--90. (Amended) The vehicle of claim ~~87~~ 88, wherein said operating modes further include a low-speed battery charging mode II, entered while RL < SP and the state of charge of the battery ~~bank~~ is below a predetermined level, and during which said vehicle is propelled by torque provided by said second electric motor in response to energy supplied from said battery ~~bank~~, and wherein said

battery ~~bank~~ is simultaneously charged by supply of electrical energy from said first electric motor, being driven by torque in excess of SP by said internal combustion engine, the combination of said engine and said first motor being disengaged from said wheels during operation in mode II.--

--91. (Amended) The vehicle of claim ~~87~~ 88, wherein the controller may control transition of the operating mode from operation in mode I directly to operation in mode V where a rapid increase in the torque to be applied to the wheels of the vehicle as desired by the operator is detected. --

--92. (Amended) The vehicle of claim ~~87~~ 88, further comprising a turbocharger operatively and controllably coupled to said internal combustion engine for being operated and thereby increasing the maximum torque output of said internal combustion engine to more than MTO when desired, and wherein said controller controls selection of the operational mode of said vehicle between a low-load mode I, a cruising mode IV, an acceleration mode V, and a sustained high-power turbocharged mode VI, in response to monitoring the instantaneous torque requirements (RL) of the vehicle over time.--

--93. (Amended) The vehicle of claim ~~91~~ 92, wherein said controller controls said vehicle to operate in said modes as follows:

in said low load mode I while RL < SP, in said highway cruising mode IV while SP < RL < MTO, in said acceleration

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