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Maeda

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(54) **VEHICLE CONTROL APPARATUS**

(56) **References Cited**

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U.S. PATENT DOCUMENTS

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5,480,363 A * 1/1996 Matsubara F16H 61/143
477/63

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2007/0102208 A1* 5/2007 Okuda B60K 6/48
180/65.31

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2012/0220422 A1* 8/2012 Wurthner B60W 10/02
477/79

FOREIGN PATENT DOCUMENTS

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JP 2011-219087 A 11/2011

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* cited by examiner

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(30) **Foreign Application Priority Data**

(57) **ABSTRACT**

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A vehicle control apparatus includes a first control section that shifts a vehicle from a normal running state to a coasting state by disengaging the clutch device of the vehicle when a predetermined execution condition is satisfied, a second control section that releases the coasting state when a brake operation or an accelerator operation is performed by a vehicle driver while the vehicle is in the coasting state, and an operation amount determination section that determines whether or not an operation amount of a brake operation or an accelerator operation performed while the vehicle is in the coasting state exceeds a release threshold. The second control section releases the coasting state if the operation amount is determined to exceed the release threshold, and does not release the coasting state if the operation amount is determined not to exceed the release threshold.

(51) **Int. Cl.**

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(58) **Field of Classification Search**

None

See application file for complete search history.

10 Claims, 6 Drawing Sheets

