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Norman et al.

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(54) **SYSTEM, APPARATUS AND METHOD FOR PROVIDING CONTROL OF A TOY VEHICLE**

(56) **References Cited**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1135 days.

This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **11/677,529**

Primary Examiner — Dmitry Suhol

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(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation of application No. 10/076,795, filed on Feb. 12, 2002, now Pat. No. 7,222,684.

(60) Provisional application No. 60/268,447, filed on Feb. 12, 2001.

(51) **Int. Cl.**

A63H 30/00 (2006.01)

B60T 7/16 (2006.01)

(52) **U.S. Cl.** **446/454**; 446/456; 446/484; 180/167; 180/65.1

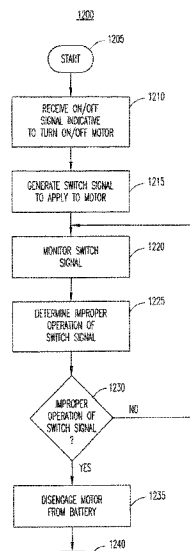
(58) **Field of Classification Search** 180/65.1, 180/167, 170, 174; 446/454-456; **A63H 30/00**

See application file for complete search history.

(57) **ABSTRACT**

A system, apparatus, and method for providing a soft-start for a toy vehicle configured to be operated by a person. The method includes receiving a throttle signal operable to induce motion via a motor operating as a drive mechanism of the toy vehicle. A transition signal may be generated based on the throttle signal. The transition signal may be applied to effect operation of the motor. The transition signal may be a pulse width modulated signal having a duty cycle between 20 and 100 percent to provide for an acceleration that avoids the problems of conventional control systems. The transition signal may be ramped in a linear or non-linear fashion. The system may couple the soft-start control circuit between a ground terminal of a battery of the toy vehicle and motor(s), thereby allowing the soft-start control circuit to operate on a low voltage (i.e., not the high voltage of the battery).

24 Claims, 13 Drawing Sheets



Dynacraft BSC, Inc.
Exhibit 1015
Dynacraft v. Mattel
IPR2018-00038

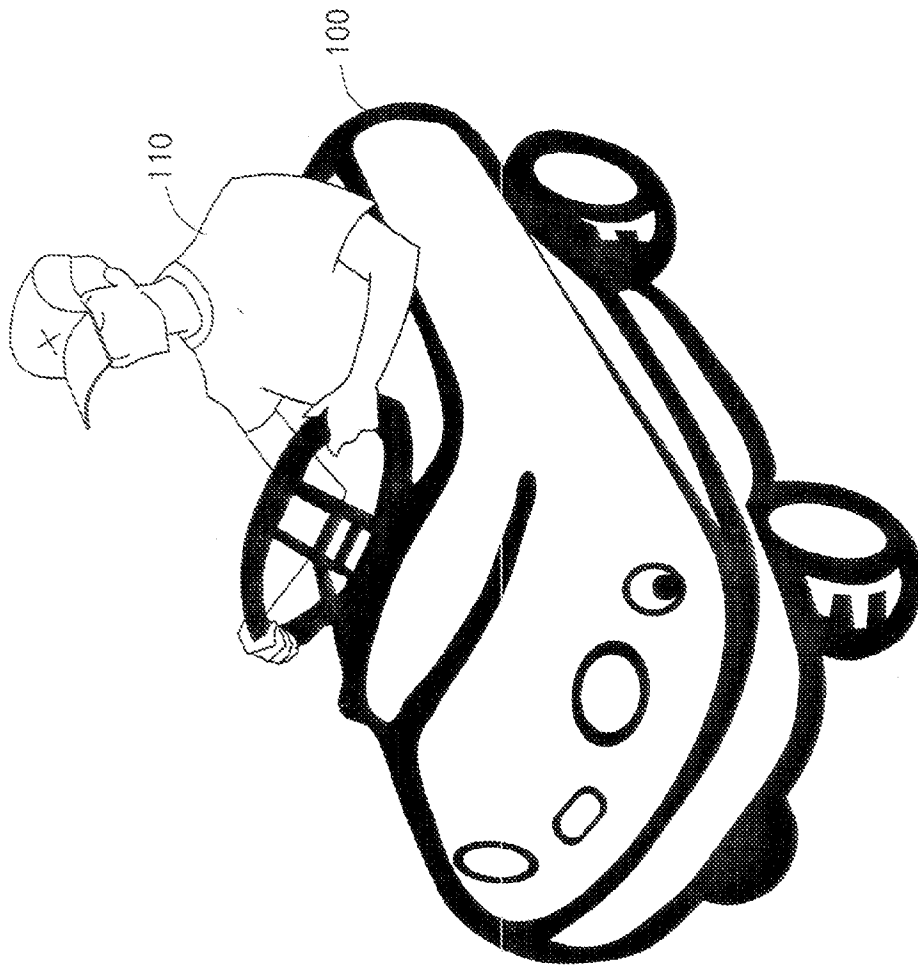


FIG. 1

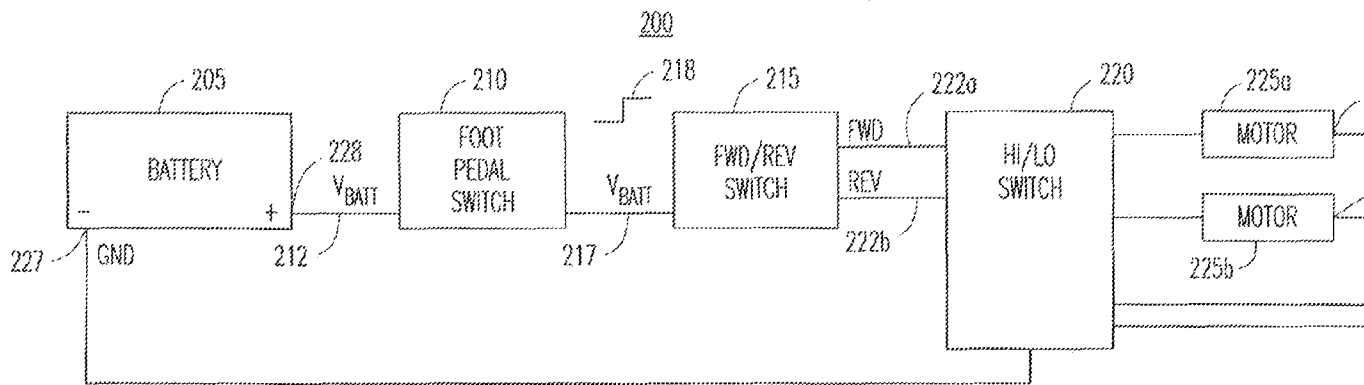


FIG. 2
(PRIOR ART)

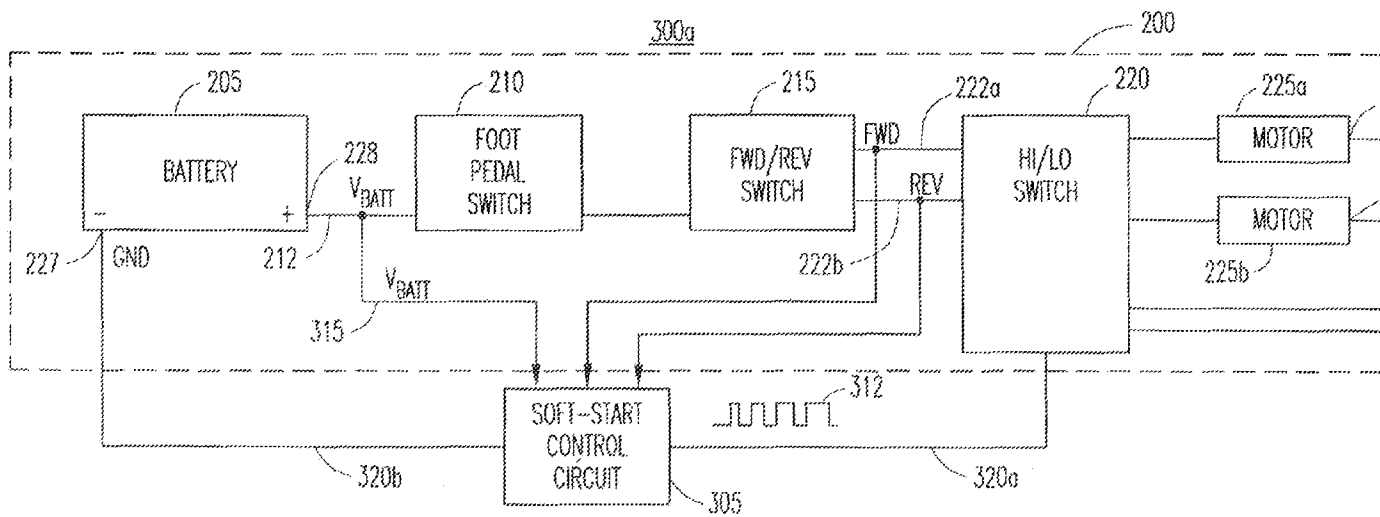


FIG. 3

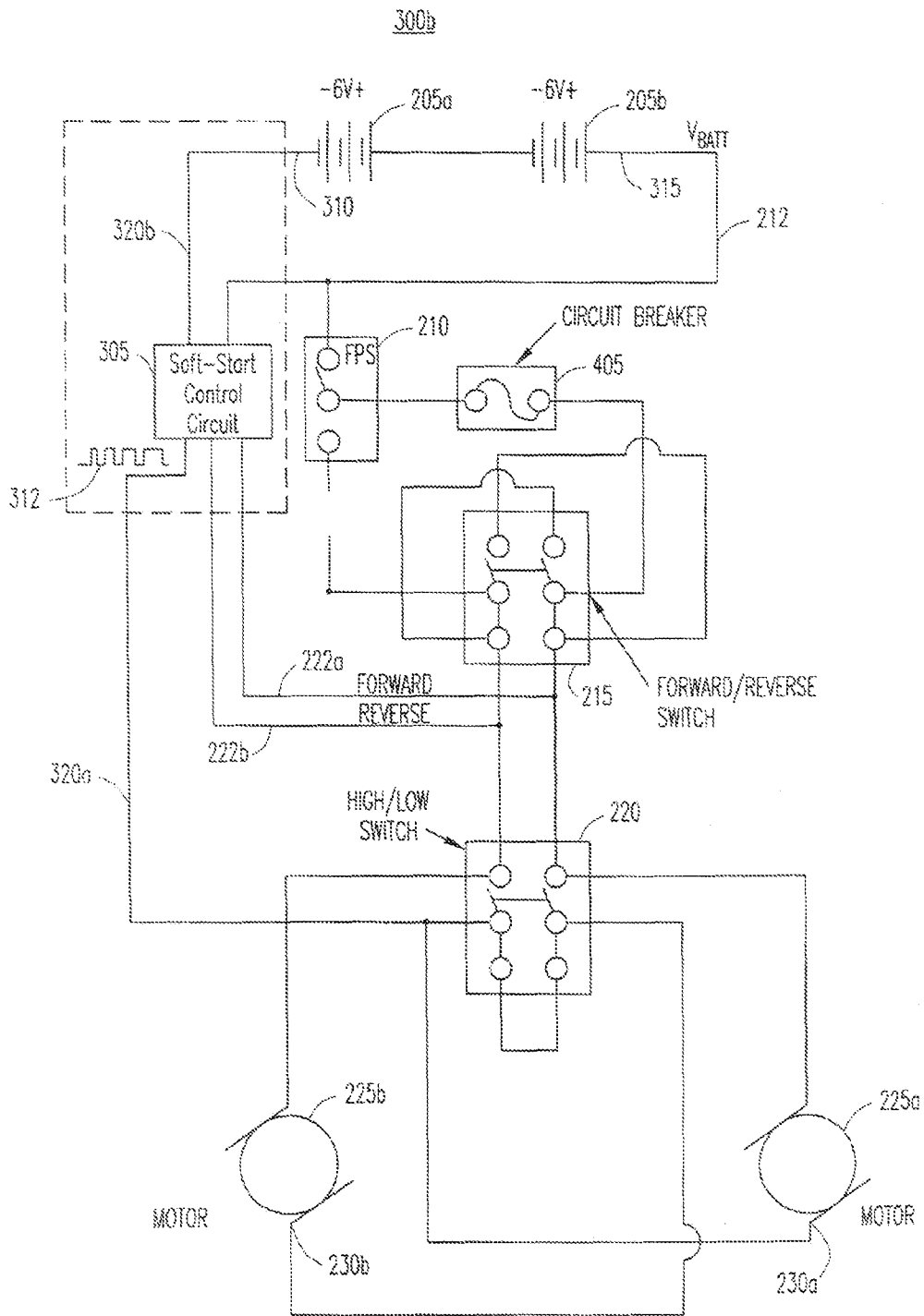


FIG. 4

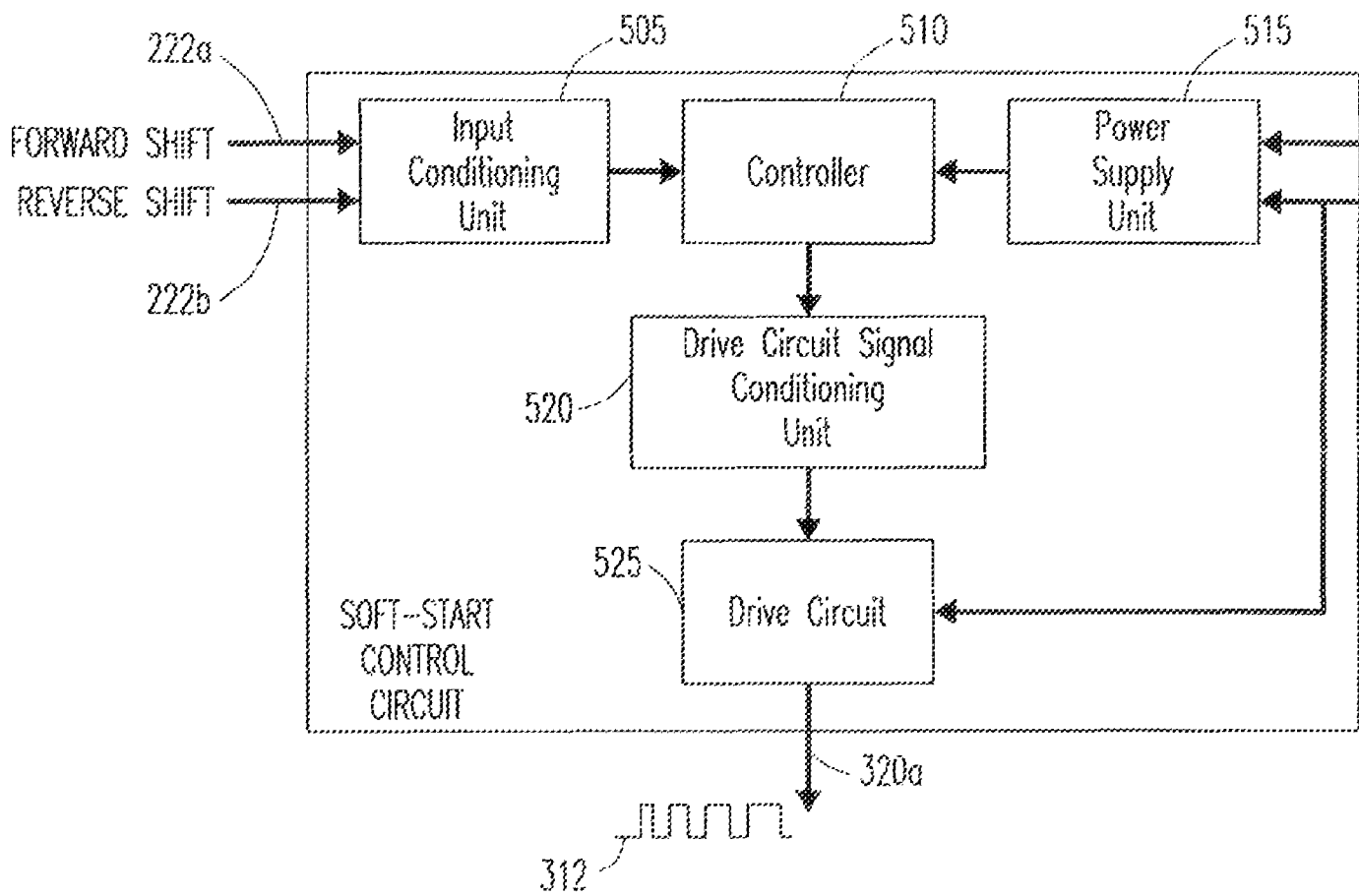


FIG. 5

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