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(12) **United States Patent**
Munoz

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(54) **MULTI-FUNCTION CONTROL AND DISPLAY APPARATUS AND DEVICE FOR AUTOMOBILES**

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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 800 days.

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Assistant Examiner—Mark Rushing

(65) **Prior Publication Data**

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(51) **Int. Cl.**

(57) **ABSTRACT**

B60R 25/10 (2006.01)
H04B 1/38 (2006.01)
G05B 23/02 (2006.01)
G05D 3/00 (2006.01)

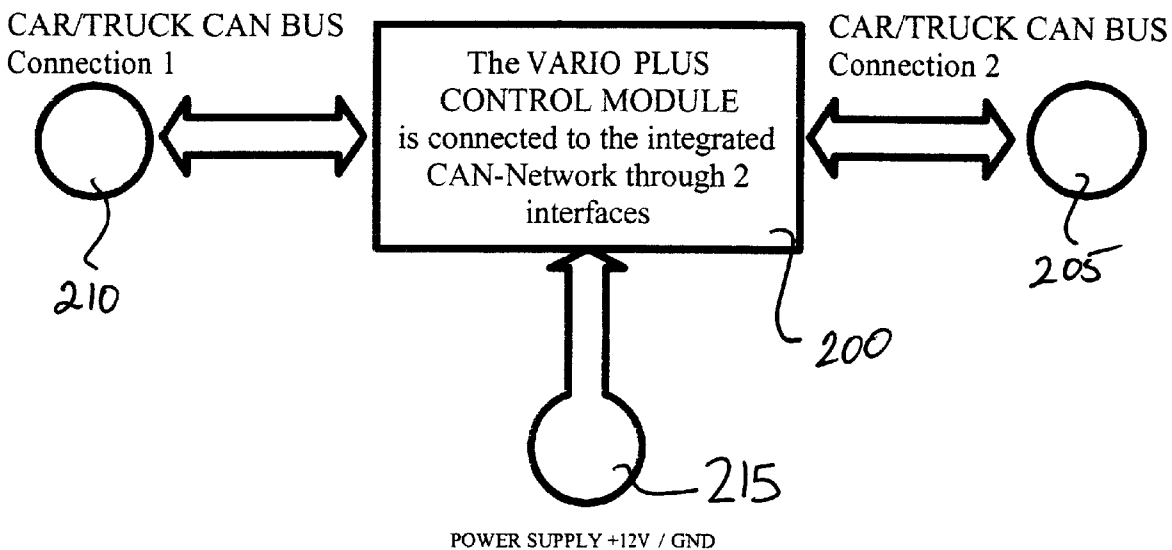
Various embodiments of this invention are directed towards an aftermarket automobile accessory that interfaces with vehicle Electronic Control Units (ECU's) and local networks such as Controller Area Network busses (CAN-busses) in order that a user may add performance, convenience, and safety systems to the vehicle using factory controls and displays. Various embodiments of the invention allow wireless control of cabriolet tops, automatic control of cabriolet tops, and the control of further vehicle systems.

(52) **U.S. Cl.** **340/426.35**; 340/426.36;
340/5.62; 340/5.61; 340/3.1; 318/466

(58) **Field of Classification Search** 340/3.1,
340/5.2, 5.51, 5.61, 5.62, 5.63, 5.64, 426.35,
340/426.36, 426.24, 426.28, 426.32, 426.34,
340/438, 5.7, 5.72, 825.69; 49/25-31; 296/107.07,
296/107.08, 107.09, 107.17, 108; 318/466

See application file for complete search history.

22 Claims, 7 Drawing Sheets



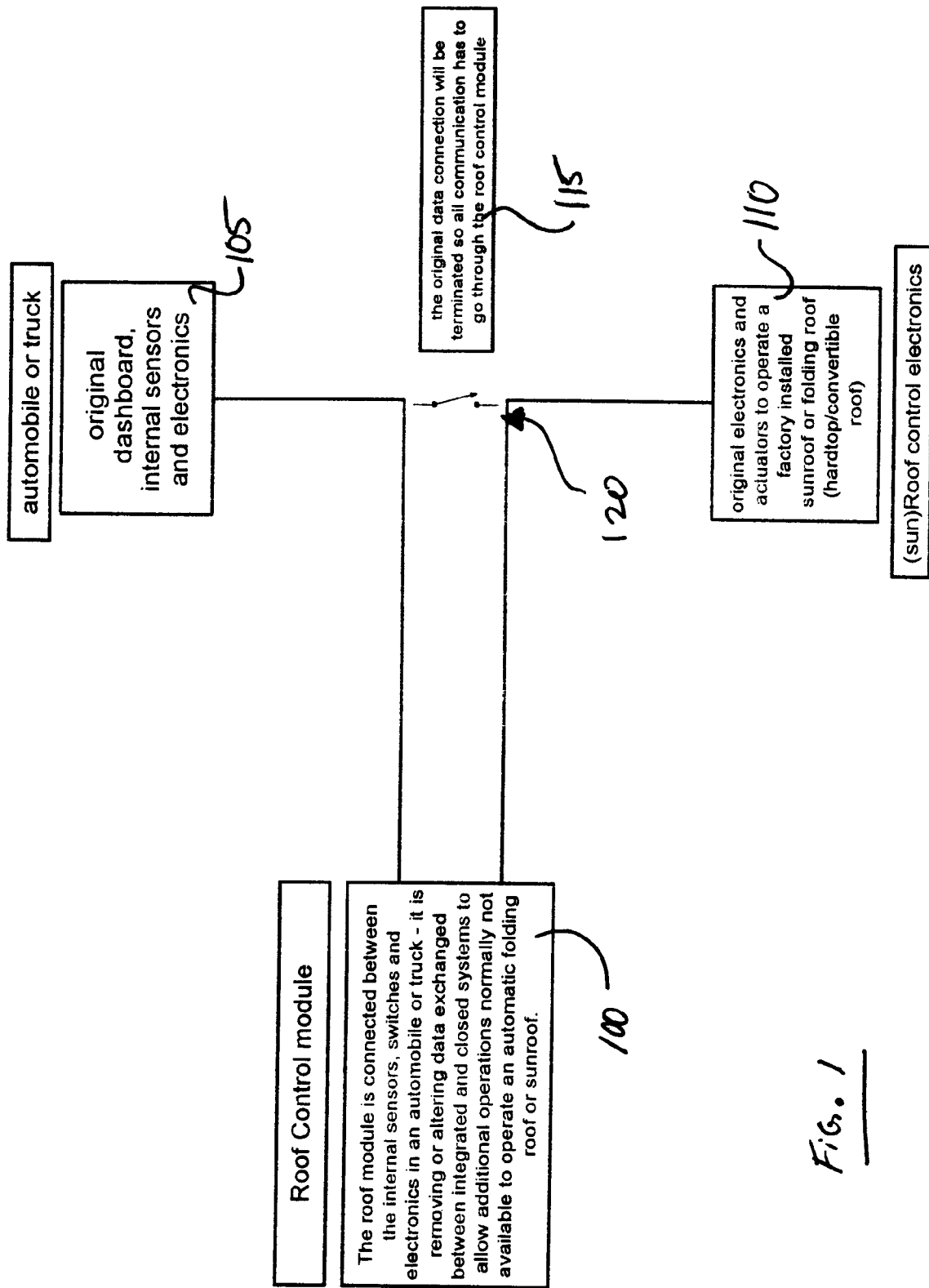


Fig. 1

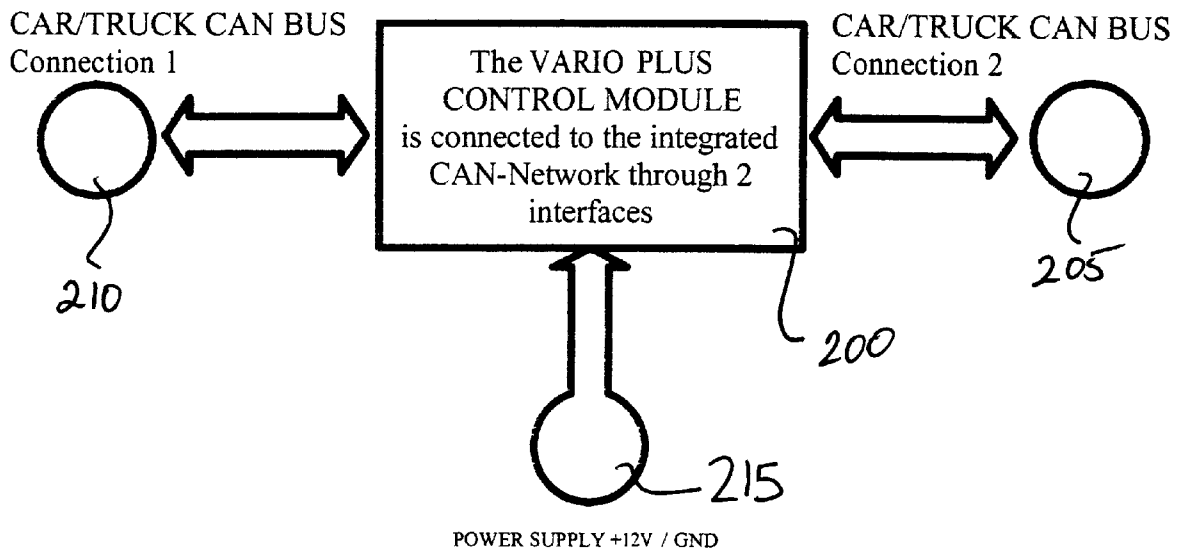


Fig. 2

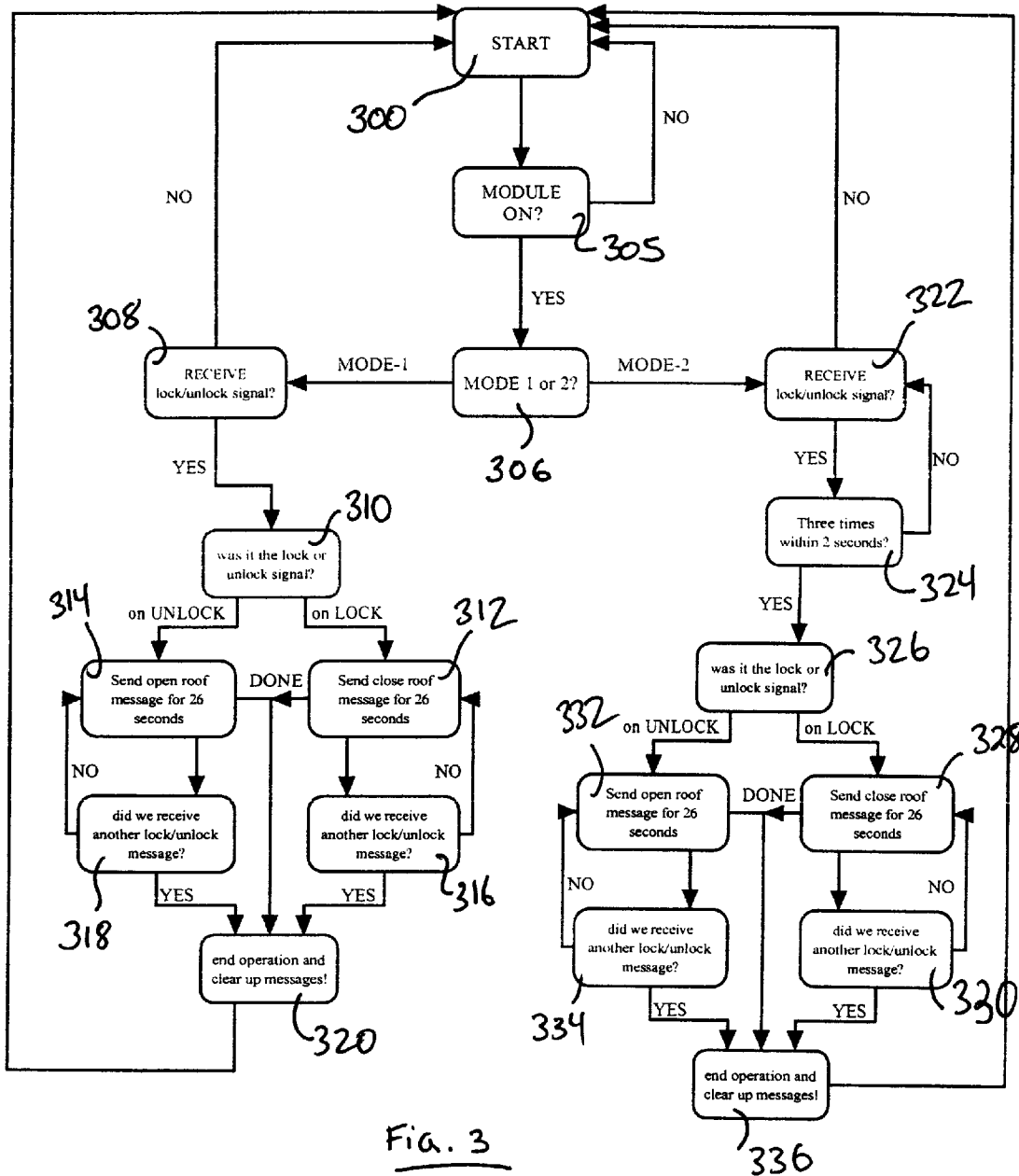


Fig. 3

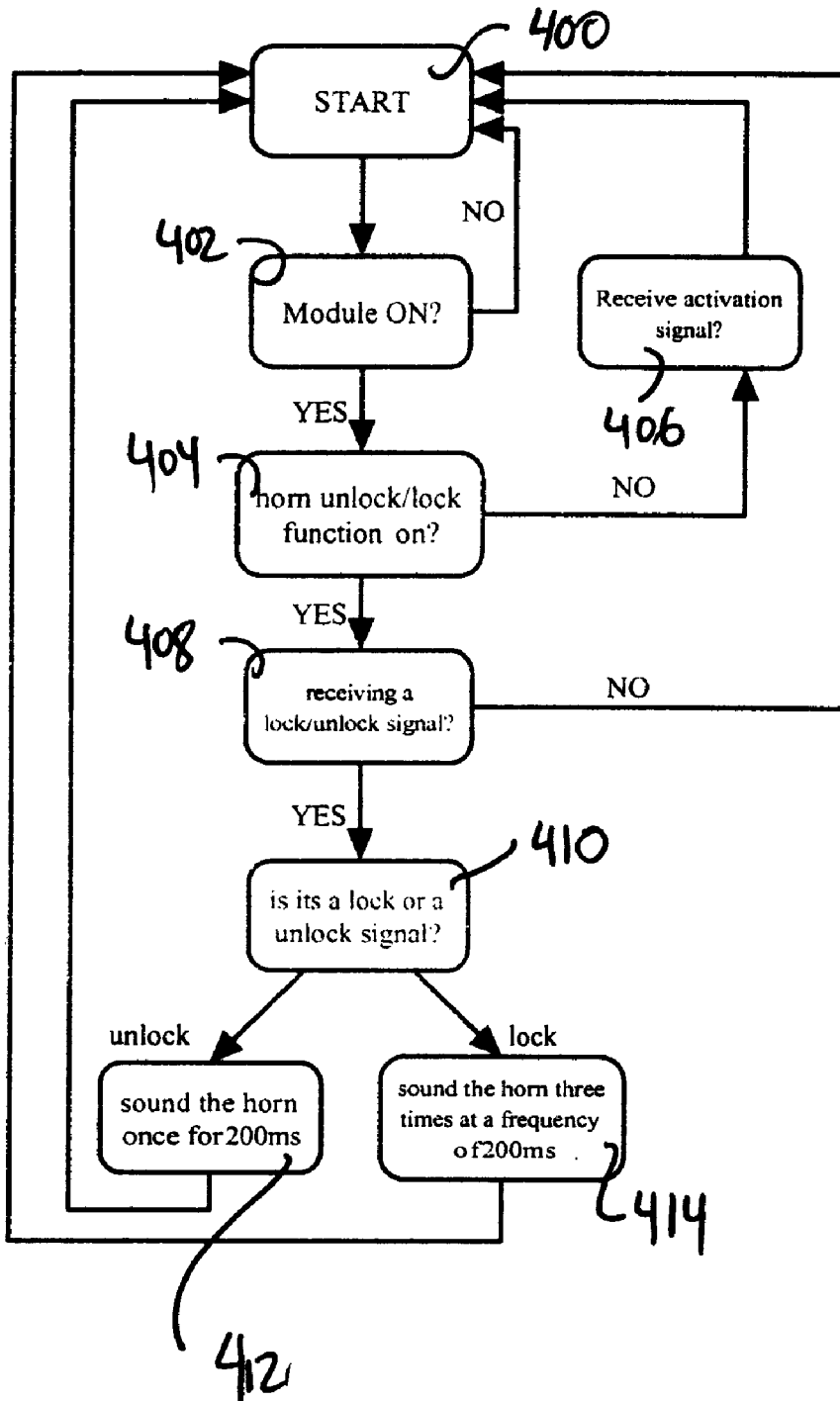


FIG. 4

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