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**Nix**

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(54) **METHOD, APPARATUS AND SYSTEM FOR RETROFITTING A VEHICLE**

USPC .. 455/404.1-2, 435.2, 435.3, 521, 445, 466, 455/527, 552.1  
See application file for complete search history.

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**Related U.S. Application Data**

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(51) **Int. Cl.**

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**H04L 12/40** (2006.01)  
**B60R 21/01** (2006.01)  
**B60T 7/12** (2006.01)  
**G06F 13/42** (2006.01)  
**B60R 21/00** (2006.01)

(52) **U.S. Cl.**

CPC ..... **H04L 12/40** (2013.01); **B60R 21/01** (2013.01); **B60T 7/12** (2013.01); **G06F 13/4282** (2013.01); **B60R 2021/0027** (2013.01); **H04L 2012/40215** (2013.01)

(58) **Field of Classification Search**

CPC .... H04W 76/007; H04W 4/22; H04B 1/3822

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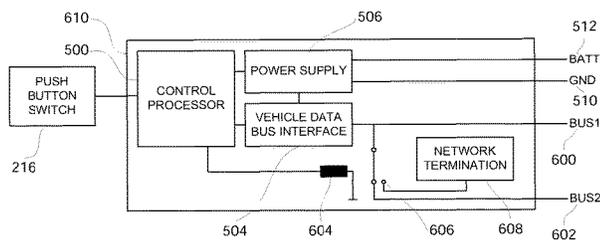
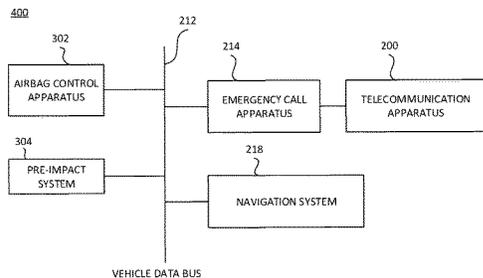
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(57) **ABSTRACT**

A system, apparatus, and method for retrofitting a vehicle are presented. The method relates to a vehicle with a factory-installed first apparatus which communicates with a factory-installed second apparatus through a vehicle data bus using a first message. The method includes electrically disconnecting the vehicle data bus between the first apparatus and the second apparatus and electrically connecting a retrofit apparatus to the vehicle data bus. The method further includes transmitting a second message from the retrofit apparatus to the first apparatus which is indistinguishable from the first message.

**19 Claims, 7 Drawing Sheets**



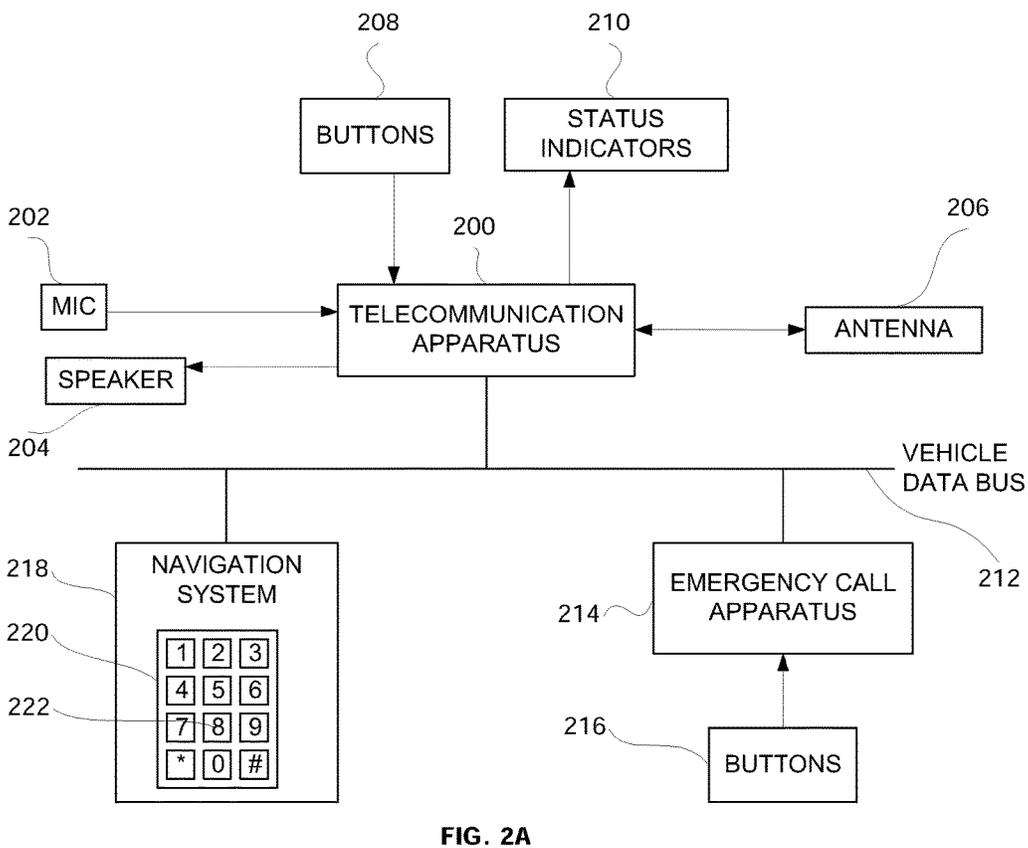
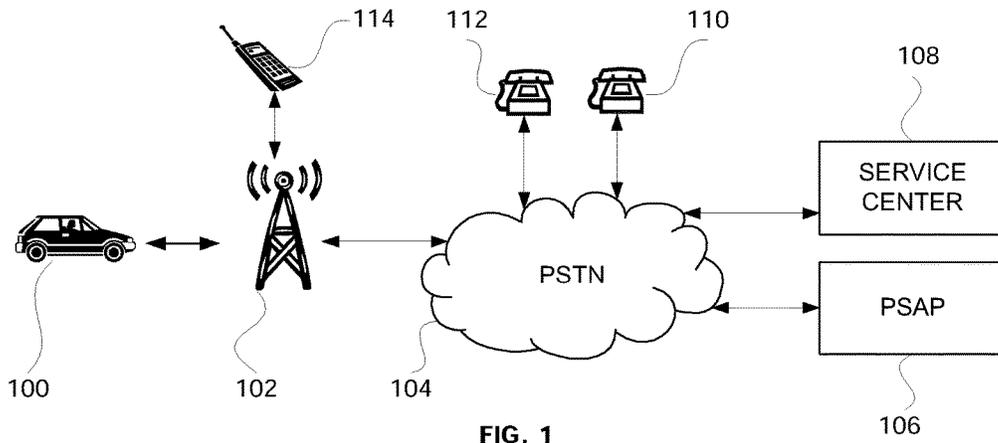
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BEFORE RETROFIT

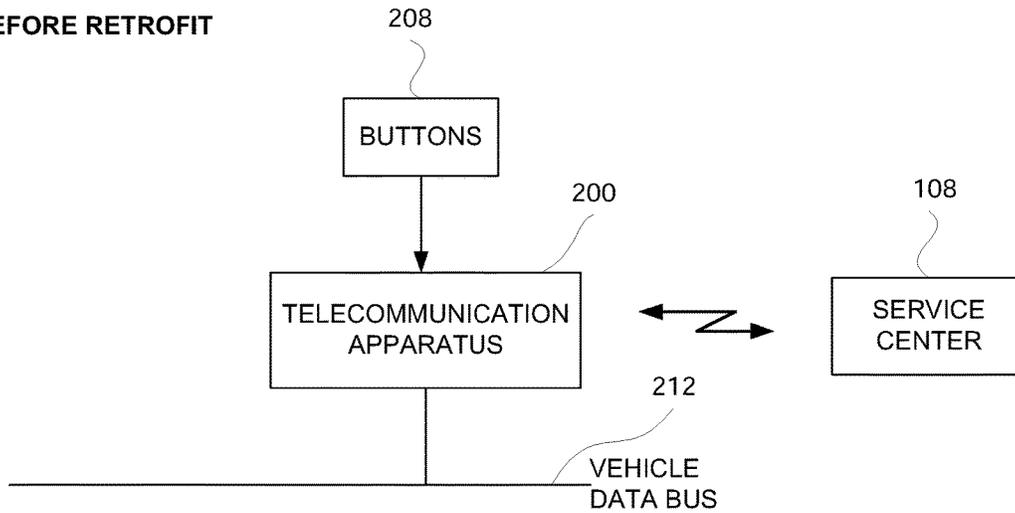


FIG. 2B (PRIOR ART)

AFTER RETROFIT

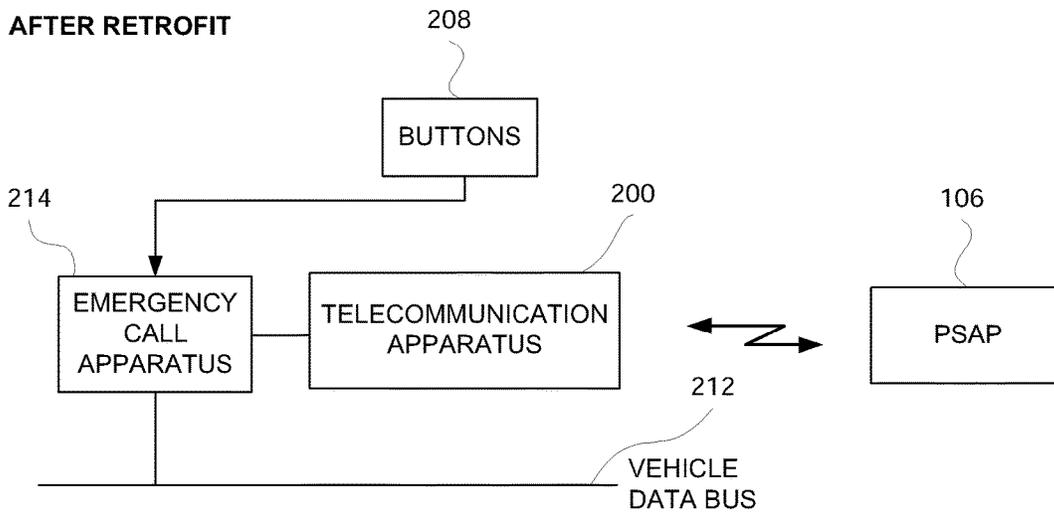


FIG. 2C

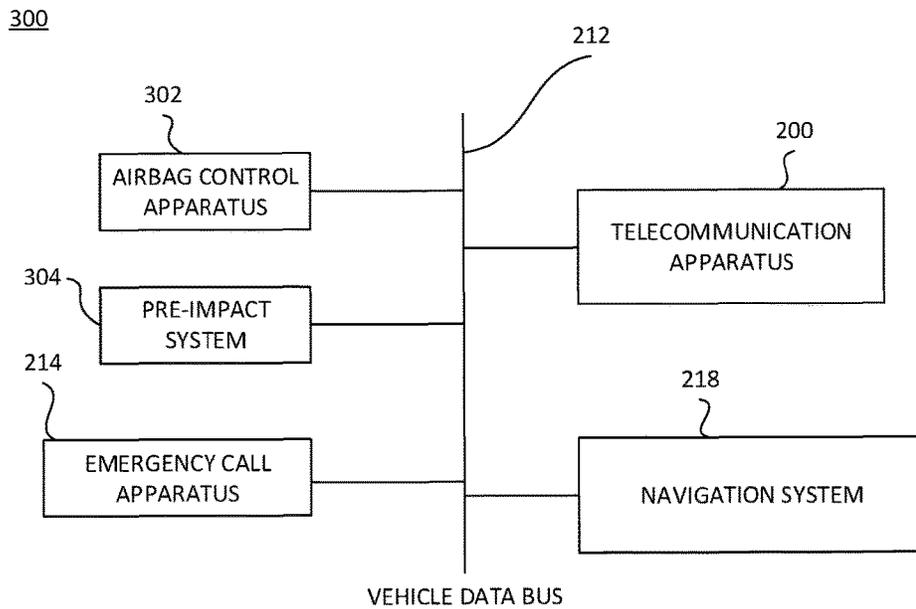


FIG. 3

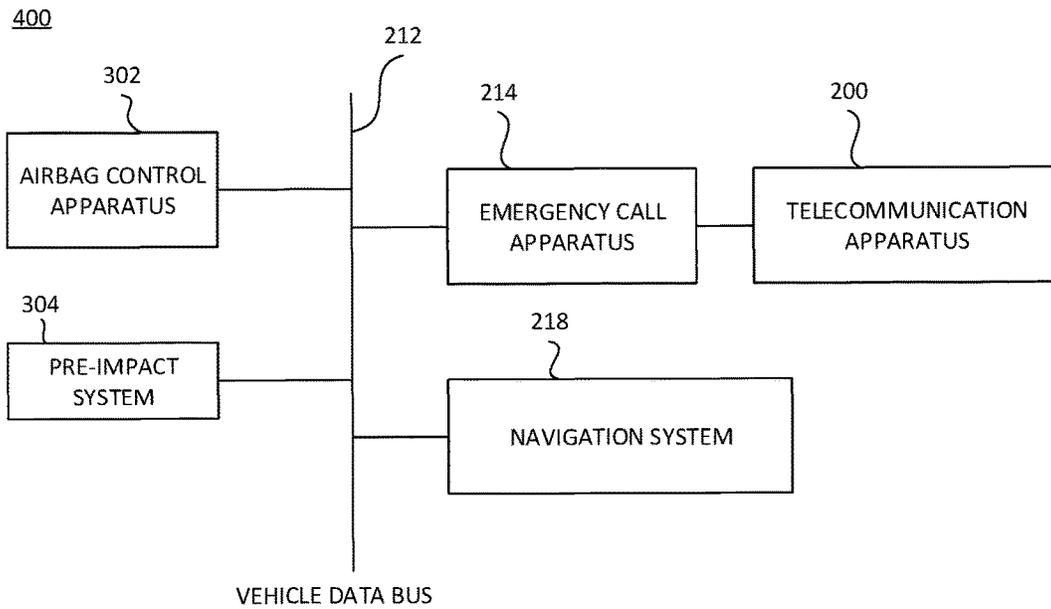


FIG. 4

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