

**United States Patent** [19]

[11] **Patent Number:** 5,465,079

**Bouchard et al.**

[45] **Date of Patent:** Nov. 7, 1995

[54] **METHOD AND APPARATUS FOR DETERMINING DRIVER FITNESS IN REAL TIME**

4,101,870	7/1978	Ekman .....	180/272
4,168,499	9/1979	Matsumura et al. ....	180/272
4,500,868	2/1985	Tokitsu et al. ....	340/439
4,804,937	2/1989	Barbiaux et al. ....	340/425.5
5,325,082	6/1994	Rodridquez .....	340/439

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[21] **Appl. No.:** 106,407

[22] **Filed:** Aug. 13, 1993

**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 930,066, Aug. 14, 1992, Pat. No. 5,302,956, and a continuation-in-part of Ser. No. 930,158, Aug. 14, 1992, abandoned.

[51] **Int. Cl.<sup>6</sup>** ..... **G08B 21/00**

[52] **U.S. Cl.** ..... **340/576; 180/272; 340/425.5; 340/439**

[58] **Field of Search** ..... **340/576, 439, 340/425.5; 180/272**

[57] **ABSTRACT**

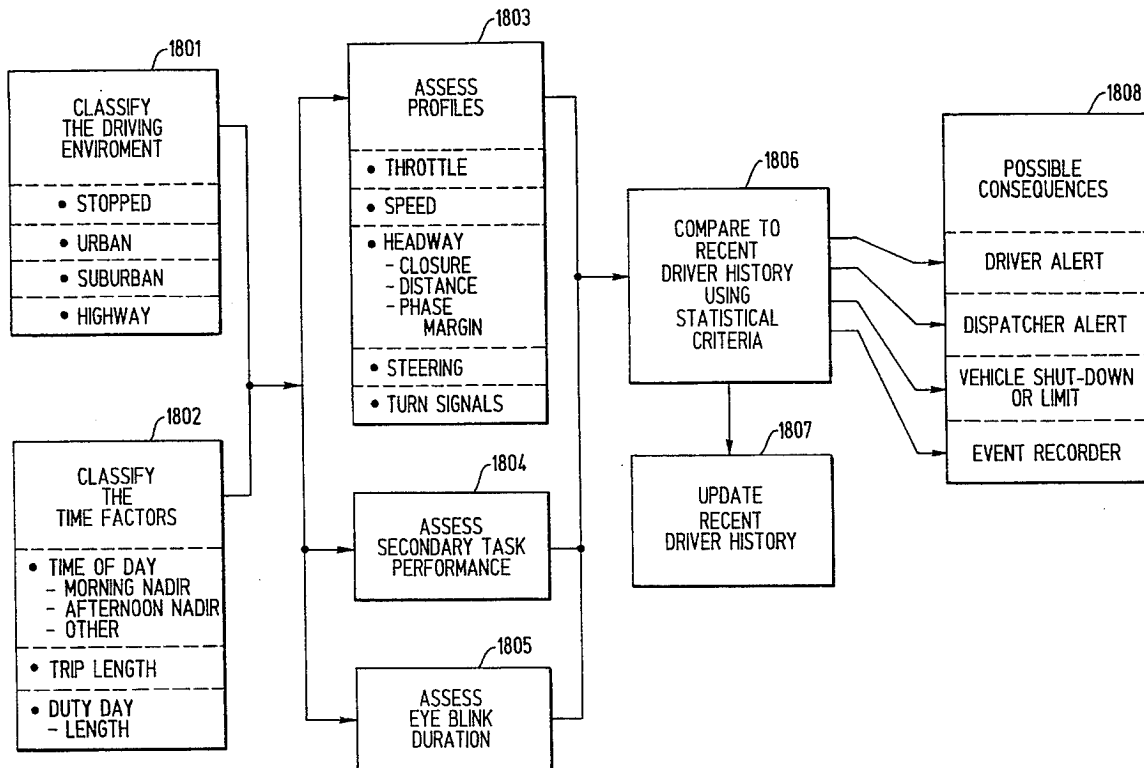
A method and apparatus for evaluating a driver's performance under actual real-time conditions and for using such evaluations to determine the driver's ability to safely operate a vehicle compares the information gathered by a radar system and other sensors with information previously stored in an event recording device. Conditions monitored are used to make a determination as to whether the driver is performing in conformity with normal driving standards and the driver's own past performance. The driver's performance is constantly monitored and compared to that driver's past performance to determine whether the driver's present performance is impaired, and if so, whether the impairment is detrimental to the driver's ability to safely operate the vehicle.

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

4,005,398 1/1977 Inoue et al. .... 340/576

**7 Claims, 18 Drawing Sheets**



**Liberty Mutual  
Exhibit 1004**

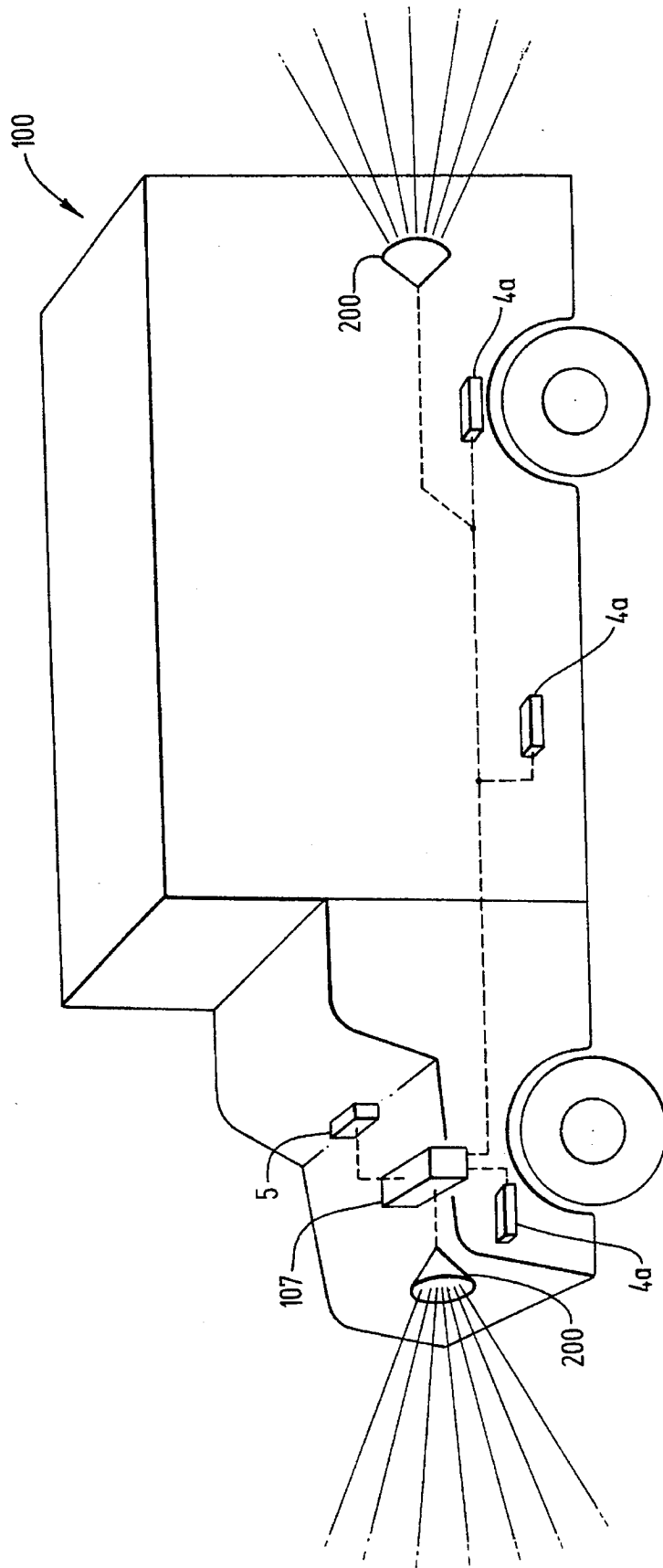


FIG. 1

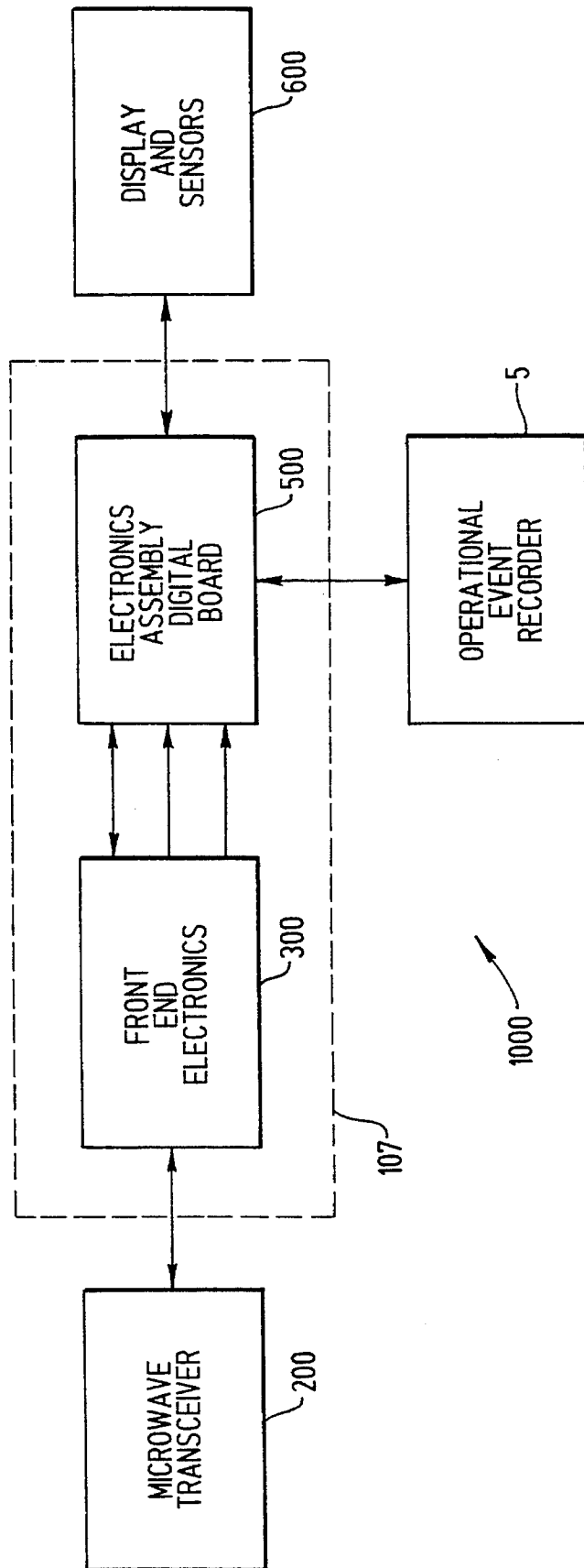


FIG. 2

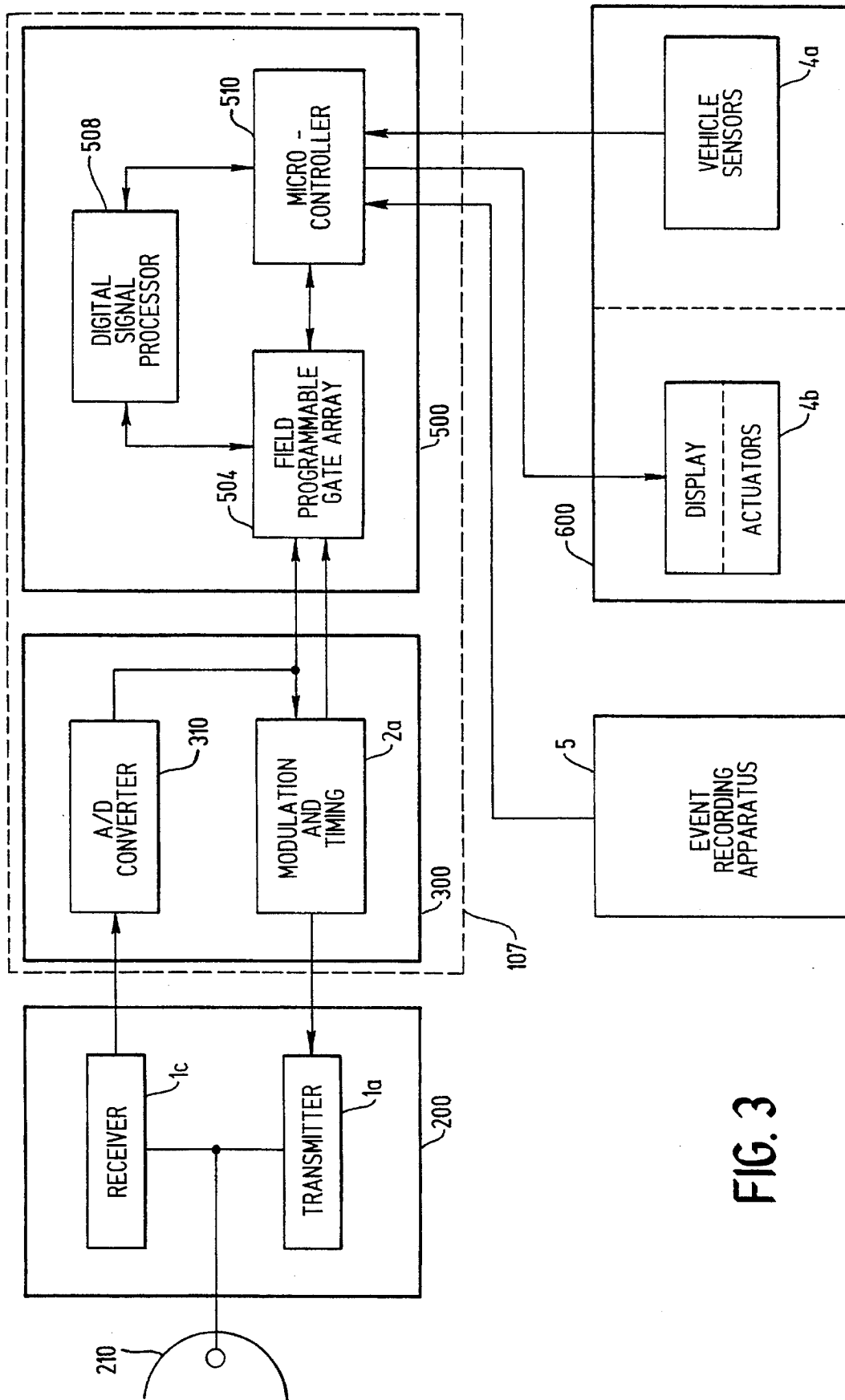


FIG. 3

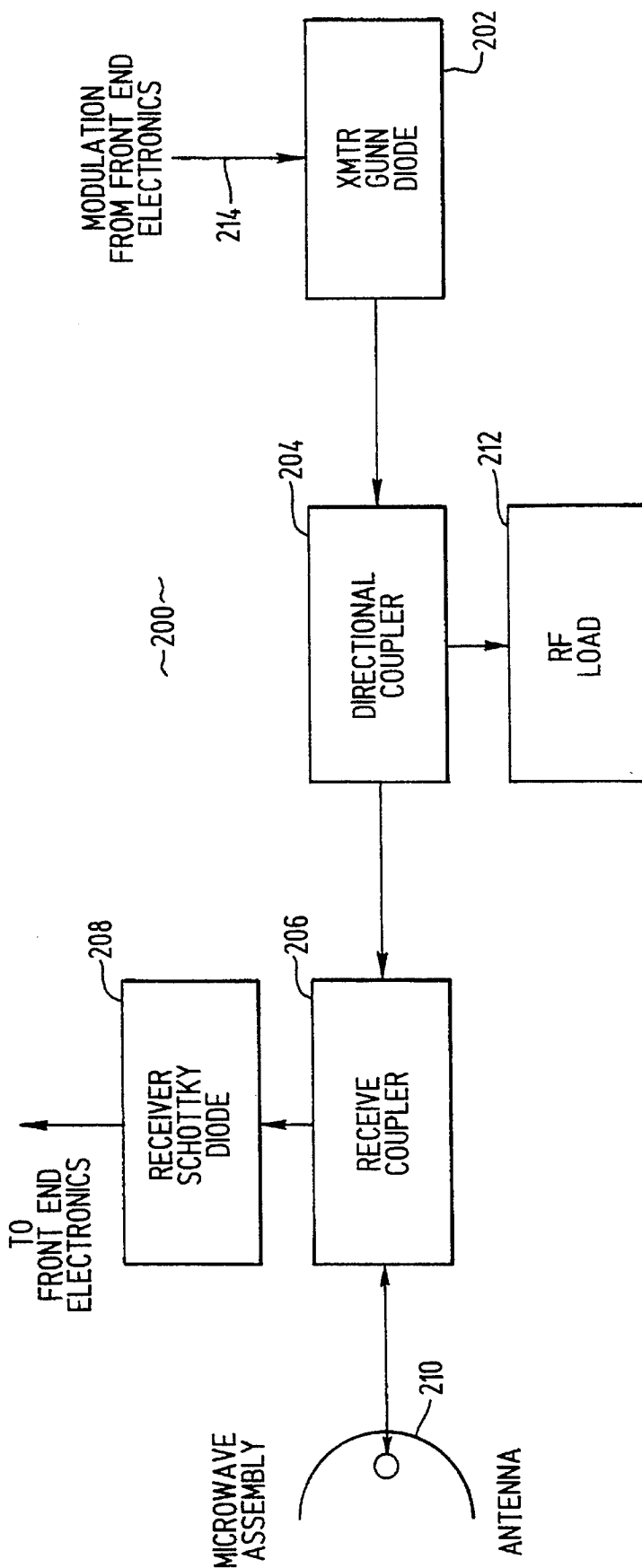


FIG. 4

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