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United States Patent [19]

Beckert et al.

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[54] **VEHICLE COMPUTER SYSTEM WITH HIGH SPEED DATA BUFFER AND SERIAL INTERCONNECT**

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[21] Appl. No.: **08/668,781**

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/564,586, Nov. 29, 1995, Pat. No. 5,794,164.

[51] **Int. Cl.**[6] **H04B 1/03**

[52] **U.S. Cl.** **701/33**; 370/522; 340/825.25; 361/814; 455/345; 307/10.7

[58] **Field of Search** 701/29–33, 24, 701/35; 364/551.01; 340/439, 426, 691, 825.5, 310.1, 538, 825.25, 815.69; 361/686, 683, 680, 814, 679; 395/281, 290; 370/522, 476, 537; 455/345, 346, 349, 348; 307/10.7, 10.1

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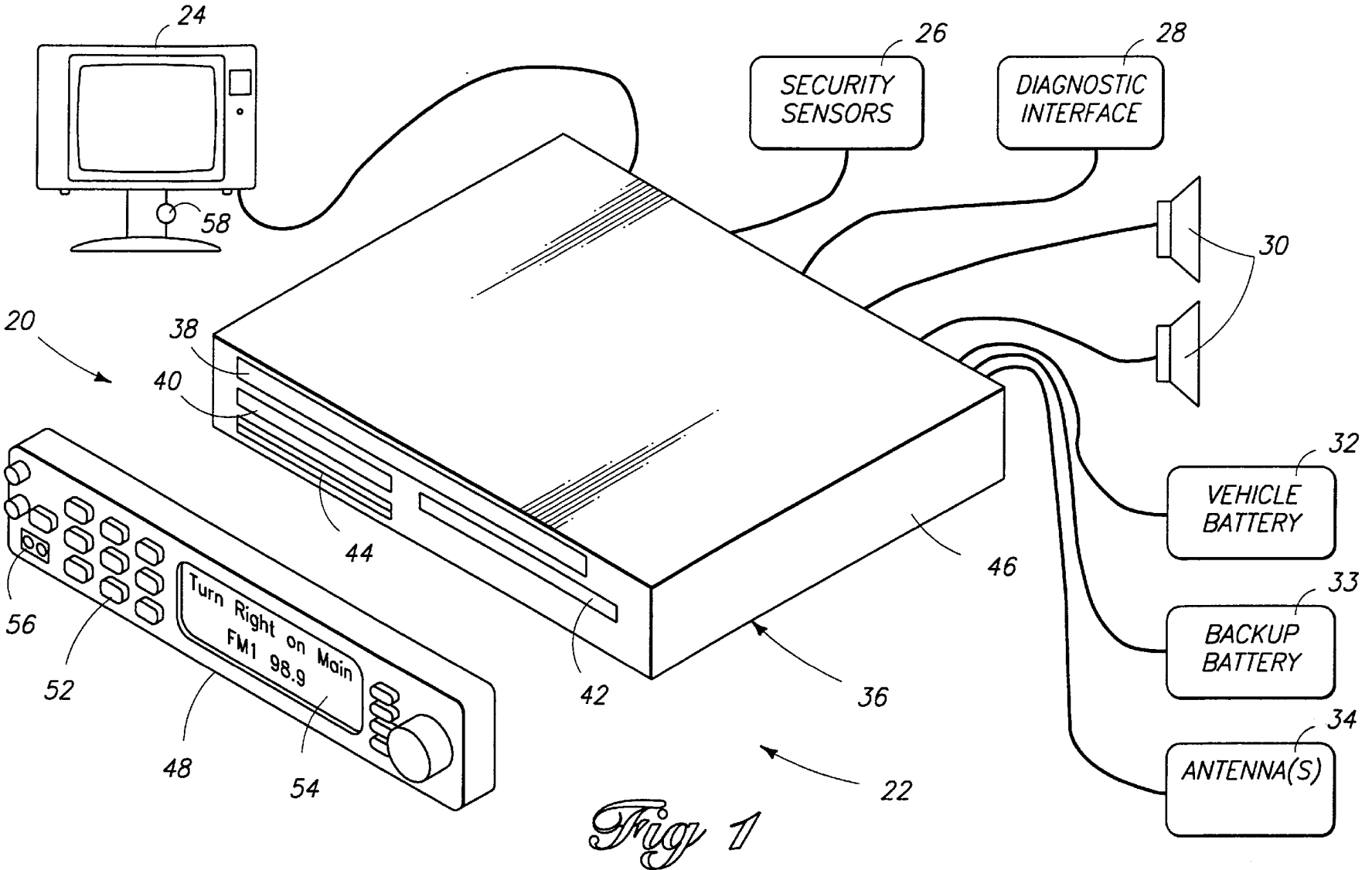|			
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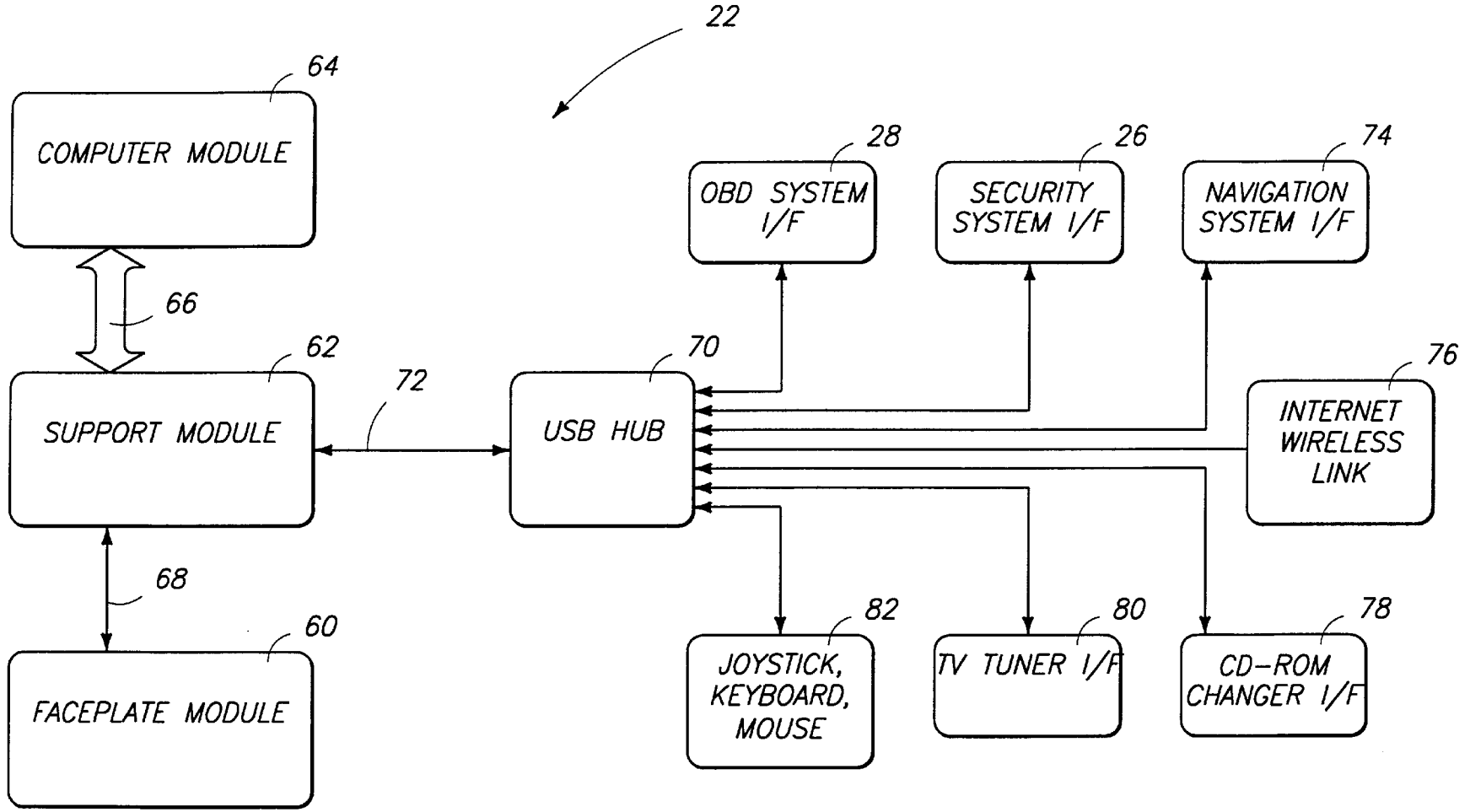*Attorney, Agent, or Firm*—Lee & Hayes, PLLC

[57] **ABSTRACT**

A vehicle computer system has a housing sized to be mounted in a vehicle dashboard or other appropriate location. The housing includes a base unit and a faceplate. A first logic unit is mounted to the base unit to form a support module. The support module has two interfacing slots and can support connections to multiple peripheral devices. The support module facilitates high speed data exchange between the peripheral devices for streaming continuous audio or video data. The support module has a fast data memory to temporarily hold data being communicated between the peripheral devices. The support module also has a memory access circuit associated with each of the peripheral devices which designates at least one storage area within the fast data memory to hold data received from, or to be sent to, the associated peripheral device. The vehicle computer has a computer module which can be connected to or removed from one interfacing slot of the support module. A multi-bit bus (e.g., PCI bus) interfaces the computer module and the support module. The vehicle computer system also has a logic unit mounted to the faceplate to form a faceplate module. This module is detachably connected to the other interfacing slot of the support module. When the faceplate module is attached, a high speed serial interface electronically couples the support module to the faceplate module. The high speed serial interface enables the logic units on the support and faceplate modules to exchange a high speed, synchronized, serial bit stream. This data stream is organized into multiple frames, with each frame having multiple data bits and at least one valid bit to indicate whether the data bits are valid.

31 Claims, 9 Drawing Sheets

Fig 1

22

COMPUTER MODULE *64*

66

SUPPORT MODULE *62*

72

FACEPLATE MODULE *60*

68

USB HUB *70*

OBD SYSTEM I/F *28*

SECURITY SYSTEM I/F *26*

NAVIGATION SYSTEM I/F *74*

INTERNET WIRELESS LINK *76*

JOYSTICK, KEYBOARD, MOUSE *82*

TV TUNER I/F *80*

CD-ROM CHANGER I/F *78*

Fig 2

COMPUTER MODULE — 64

- 138 — PC CARD I/F
- 140 — SMART CARD I/F
- 130 — µP
- 134 — DRAM
- 136 — FLASH
- 132 — DISK

SUPPORT MODULE — 62

- 100 — GPS CHIPSET
- 102 — CODEC
- 96 — AUDIO SIGNAL PROCESSOR
- 98 — AM/FM TUNER MODULE
- 92 — USB I/F
- 94 — VGA CONTROLLER
- 90 — LOGIC UNIT
- 110 — FAST DATA MEMORY

FACEPLATE MODULE — 60

- 52 — KEYPAD
- 54 — DISPLAY
- 56 — IRDA
- 122 — CODEC
- 120 — LOGIC UNIT
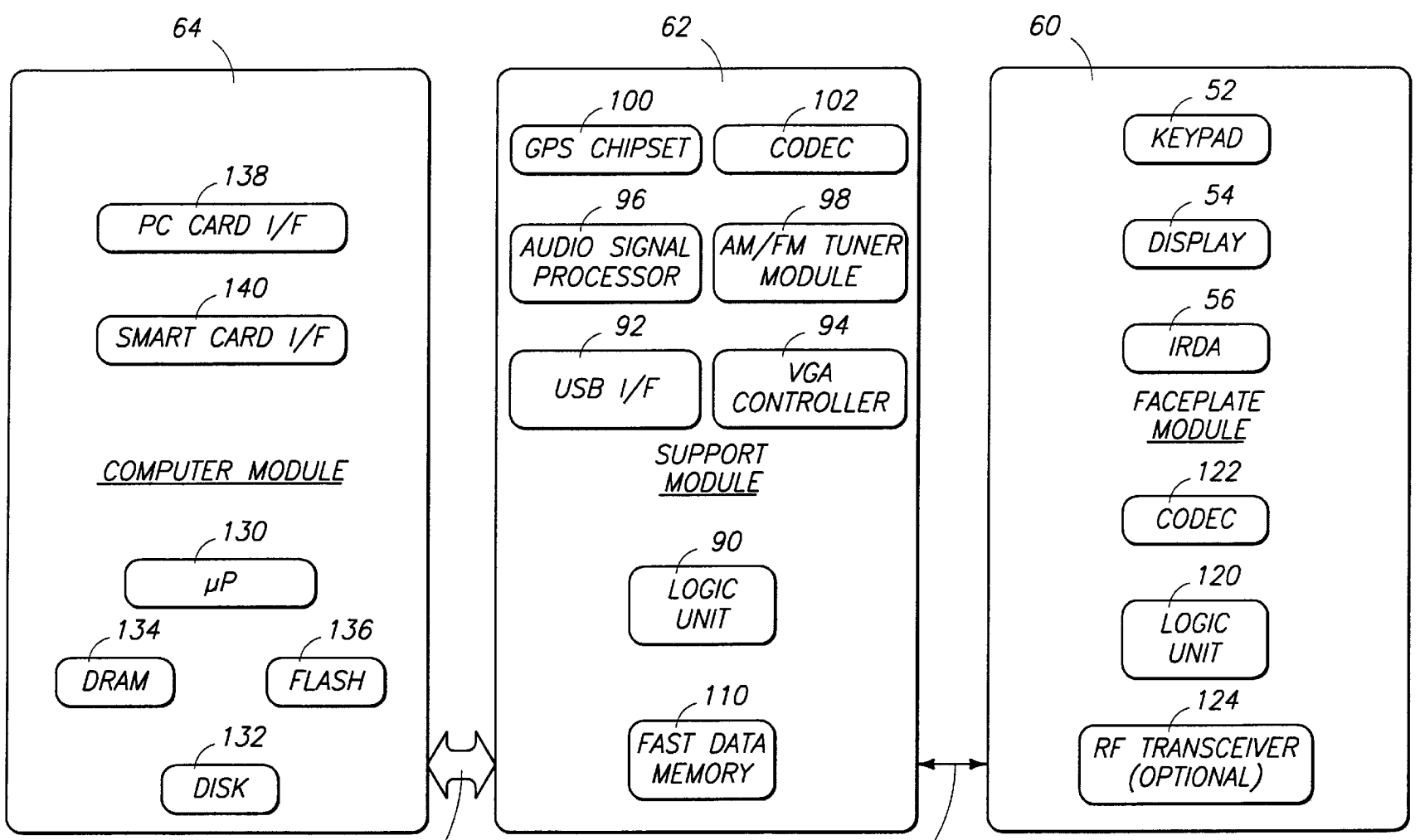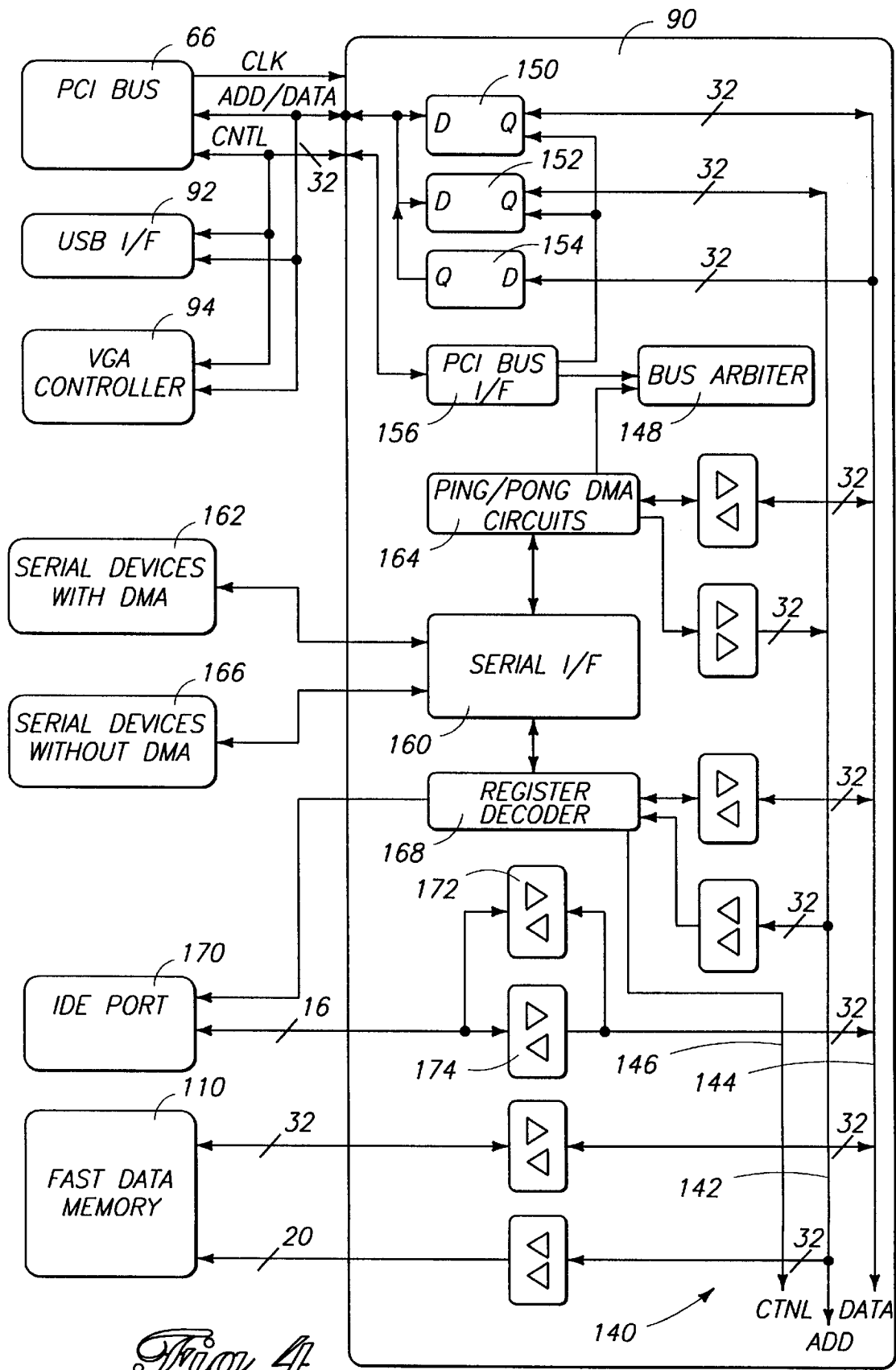- 124 — RF TRANSCEIVER (OPTIONAL)

66   68

Fig 3

Fig 4

DOCKET ALARM

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