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Casebolt et al.

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(54) **METHOD AND APPARATUS FOR DETECTING THE TYPE OF INTERFACE TO WHICH A PERIPHERAL DEVICE IS CONNECTED**

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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 0 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **Oct. 1, 1999**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/112,171, filed on Jul. 8, 1998, now Pat. No. 6,460,094.

(51) **Int. Cl.**⁷ **G06F 9/45**

(52) **U.S. Cl.** **716/8; 716/9; 716/10; 716/11**

(58) **Field of Search** **716/4, 8; 712/1, 712/230; 710/8, 26, 63, 108, 262, 269, 305, 306; 379/142.15**

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|-------------|---------|---------------------|---------|
| 4,500,933 A | 2/1985 | Chan | 360/69 |
| 4,785,469 A | 11/1988 | Joshi et al. | 375/110 |
| 5,043,938 A | 8/1991 | Ebersole | 364/900 |
| 5,473,264 A | 12/1995 | Mader et al. | 326/30 |
| 5,481,696 A | 1/1996 | Lomp et al. | 395/500 |
| 5,548,782 A | 8/1996 | Michael et al. | 395/835 |
| 5,577,213 A | 11/1996 | Avery et al. | 395/280 |
| 5,612,634 A | 3/1997 | MacKenna | 326/62 |

| | | | |
|--------------|-----------|-----------------------|---------|
| 5,644,790 A | 7/1997 | Li et al. | 395/883 |
| 5,754,890 A | 5/1998 | Holmdahl et al. | 395/883 |
| 5,793,999 A | 8/1998 | Mori | 395/309 |
| 5,828,905 A | 10/1998 | Rao | 395/883 |
| 5,832,244 A | 11/1998 | Jolley et al. | 395/309 |
| 5,857,112 A | 1/1999 | Hashemi et al. | 395/828 |
| 5,928,347 A | 7/1999 | Jones | 710/129 |
| 5,935,224 A | 8/1999 | Svancarek et al. | 710/63 |
| 6,006,295 A | 12/1999 | Jones et al. | 710/62 |
| 6,460,094 B1 | * 10/2002 | Hanson et al. | 710/8 |

FOREIGN PATENT DOCUMENTS

| | | |
|----|--------------|--------|
| EP | 0 860 781 A2 | 2/1998 |
| WO | WO 97/31386 | 8/1997 |
| WO | WO 97/17214 | 4/1999 |

OTHER PUBLICATIONS

Universal Serial Bus Specification, Rev. 1.1, Section 7.1.5: Device speed identification, pp. 113 and 114, Sep. 23, 1998.

* cited by examiner

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(57) **ABSTRACT**

A peripheral device is connectable to a computer having one of a first interface and a second interface. The first interface communicates with the peripheral device over a differential data connection having a first data conductor and a second data conductor. The second interface communicates with the peripheral device over a clock conductor and a single ended data connection which includes a data conductor. The peripheral device includes an interface detection component coupled to at least one of first and second communication conductors used to communicate between the peripheral device and the computer. The interface detection component is configured to detect which of the first and second interfaces the peripheral device is connected to.

33 Claims, 7 Drawing Sheets

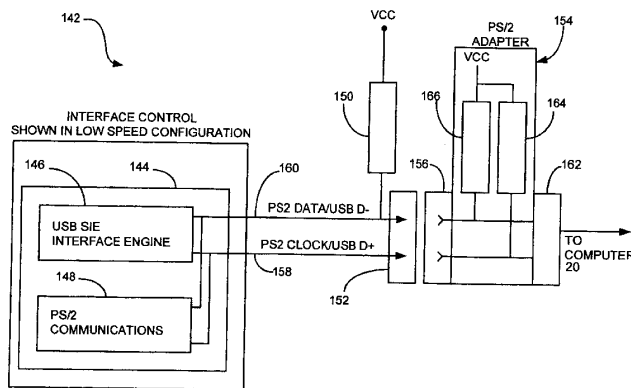
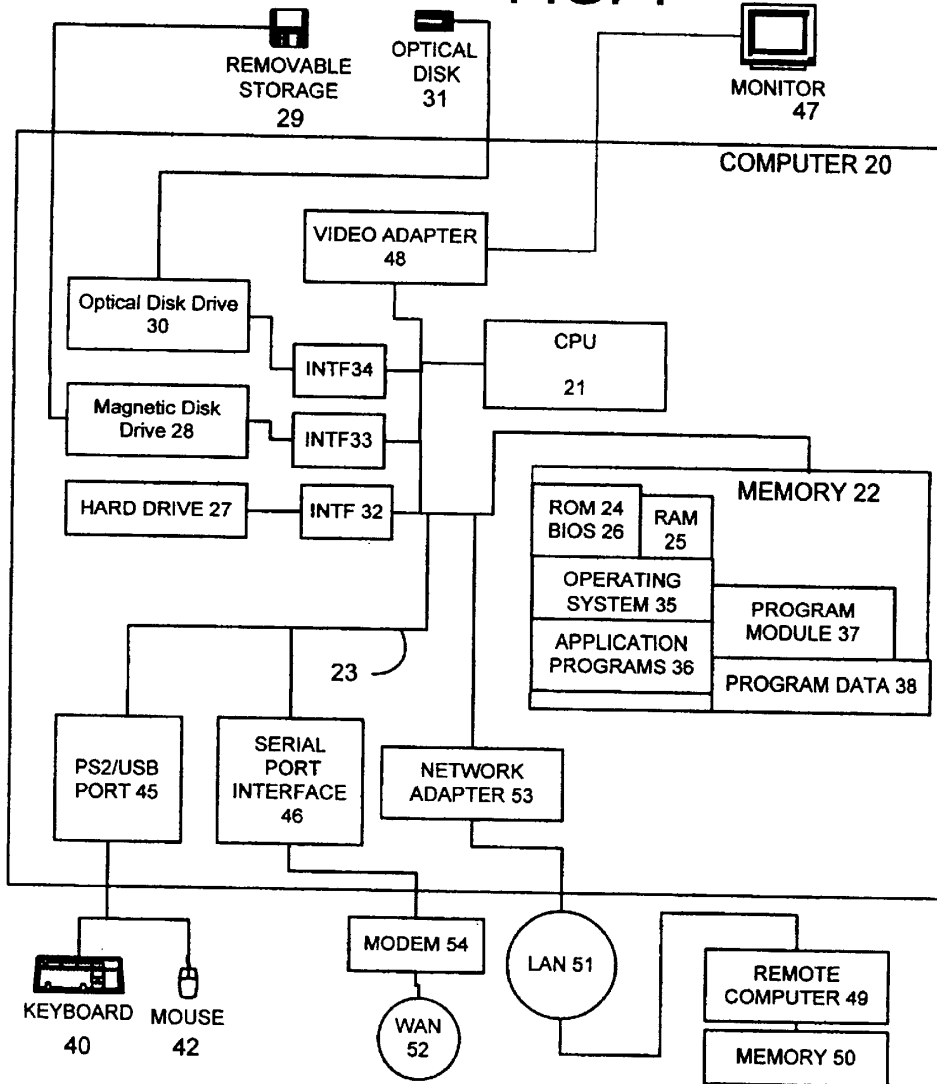


FIG. 1



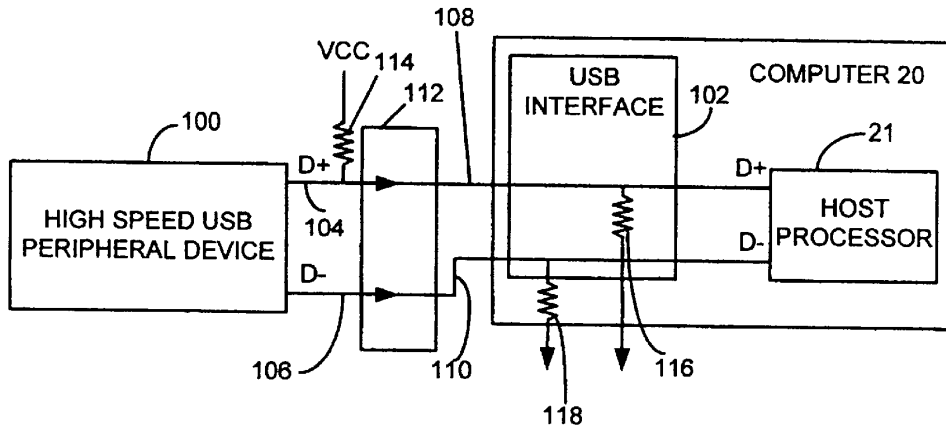


FIG. 2A

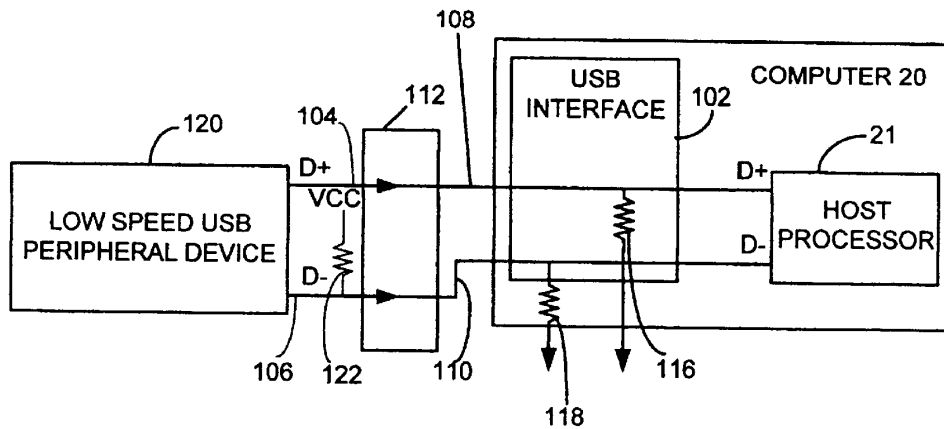


FIG. 2B

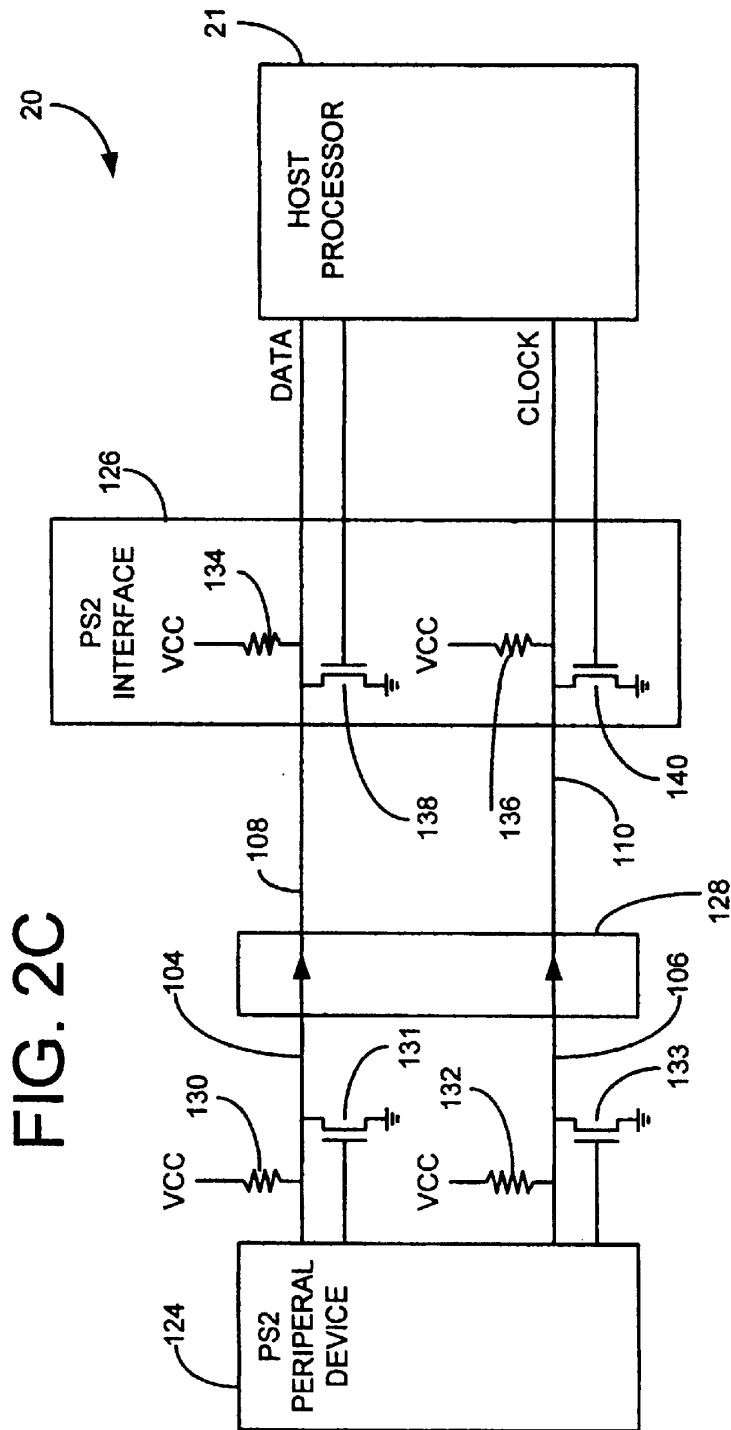


FIG. 2C

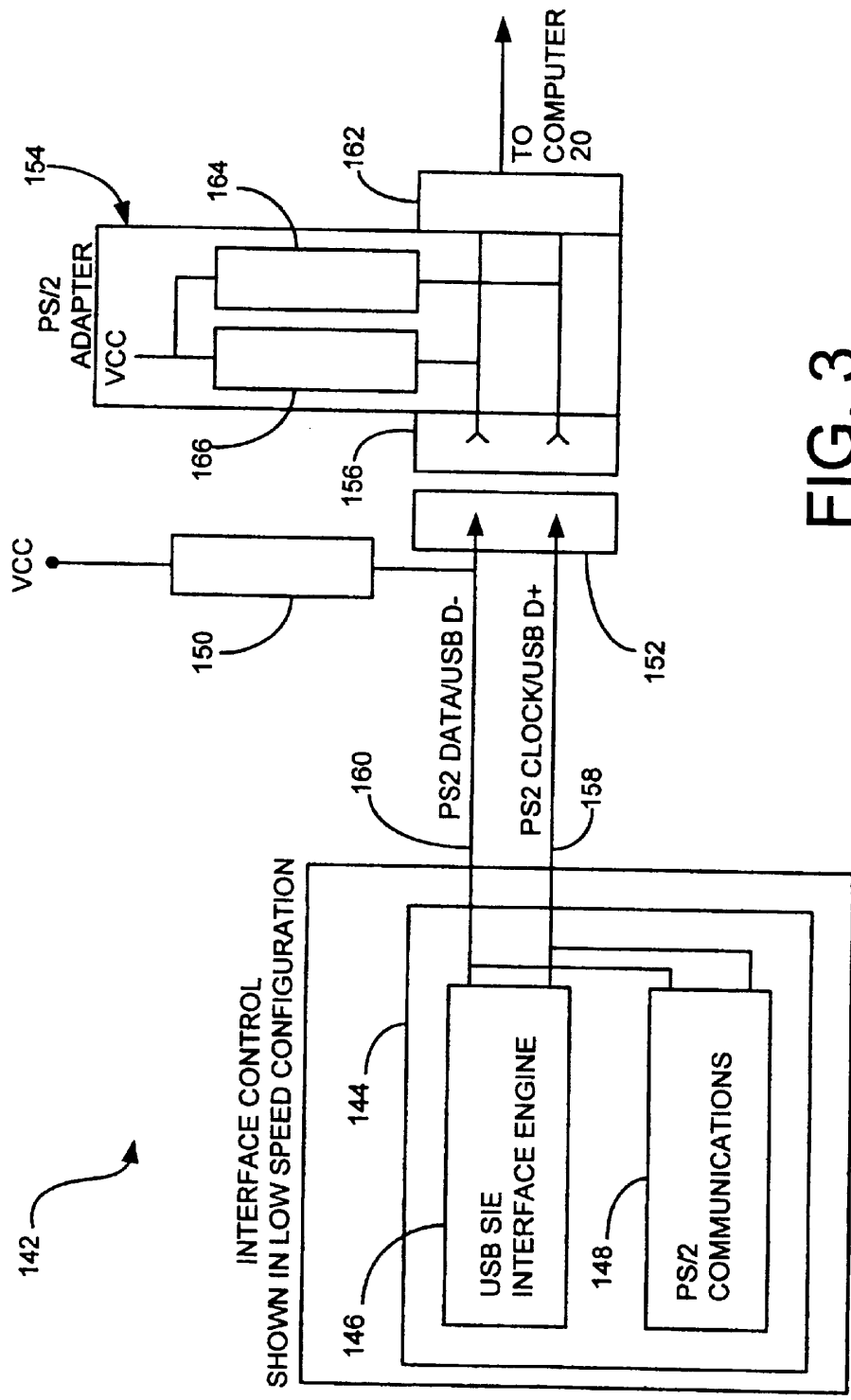


FIG. 3

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