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**Bork et al.**

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(54) **METHOD AND APPARATUS FOR USING A UNIVERSAL SERIAL BUS TO PROVIDE POWER TO A PORTABLE ELECTRONIC DEVICE**

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(73) Assignee: **Texas Instruments Incorporated, Dallas, TX (US)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(51) **Int. Cl.**<sup>7</sup> ..... **G06F 13/00; G06F 15/177; G06F 1/26; H02J 7/00; H02M 7/00**

(52) **U.S. Cl.** ..... **710/72; 710/8; 710/10; 710/15; 710/18; 710/19; 710/62; 710/63; 710/64; 710/101; 710/103; 710/104; 710/129; 713/1; 713/300; 713/340; 363/13; 320/107; 320/110; 320/112; 320/113; 320/114; 320/115**

(58) **Field of Search** ..... **710/1, 2, 7, 8, 710/10, 11, 15, 18-20, 29, 62-64, 71-74, 100-105, 126, 129; 713/1, 100, 300, 320, 340; 363/13; 320/107, 110, 112-115**

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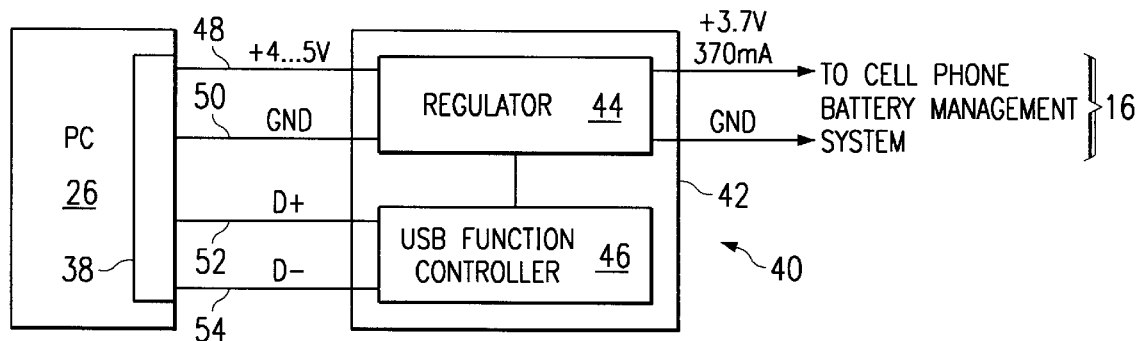
*Primary Examiner*—Jeffrey Gaffin

*Assistant Examiner*—Tanh Q Nguyen

(57) **ABSTRACT**

A method and apparatus for using a universal serial bus "USB" in a computer as a power source for a portable electronic device. In one embodiment of the invention, a computer (26) having an external USB connector (38) is coupled to the external power input connector on a portable electronic device, such as a cellular telephone (14). The computer (26) is coupled to the cellular telephone (14) via a cable having one end connected to a first connector and another end connected to a second connector, the first connector being connected to the USB connector (38) on said computer (26), and the second connector being connected to external power input connector on the portable electronic device. The cable includes electronic circuitry (42, 62) for converting the voltage level supplied by the USB to a voltage level usable by the portable electronic device.

**35 Claims, 9 Drawing Sheets**



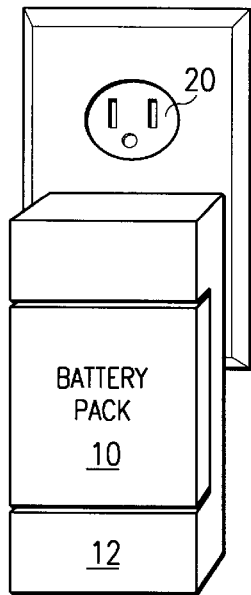


FIG. 1  
(PRIOR ART)

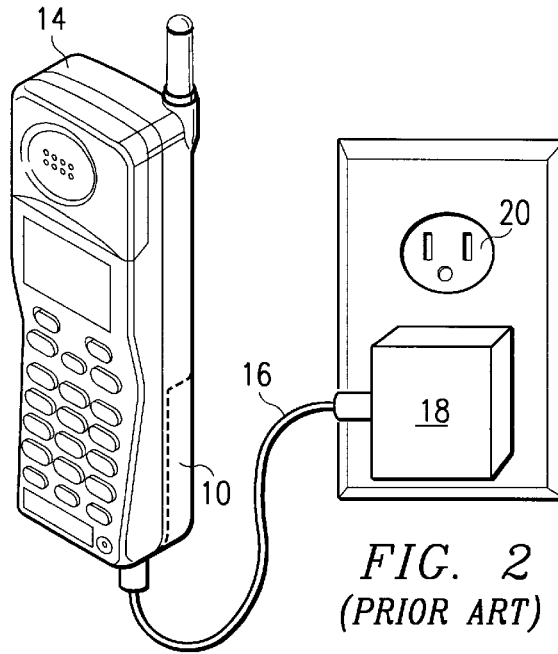


FIG. 2  
(PRIOR ART)

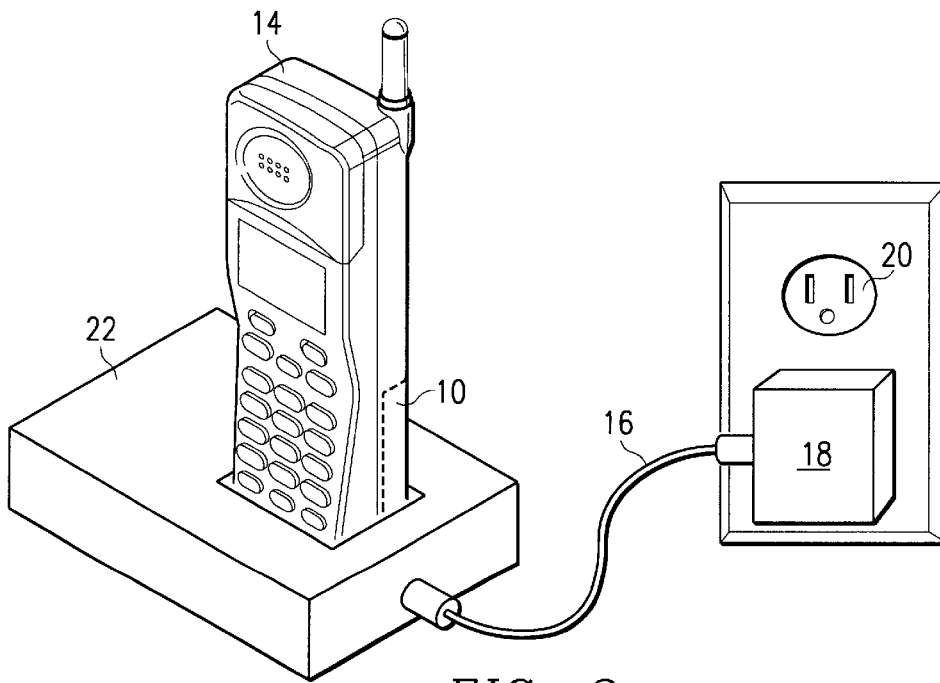


FIG. 3  
(PRIOR ART)

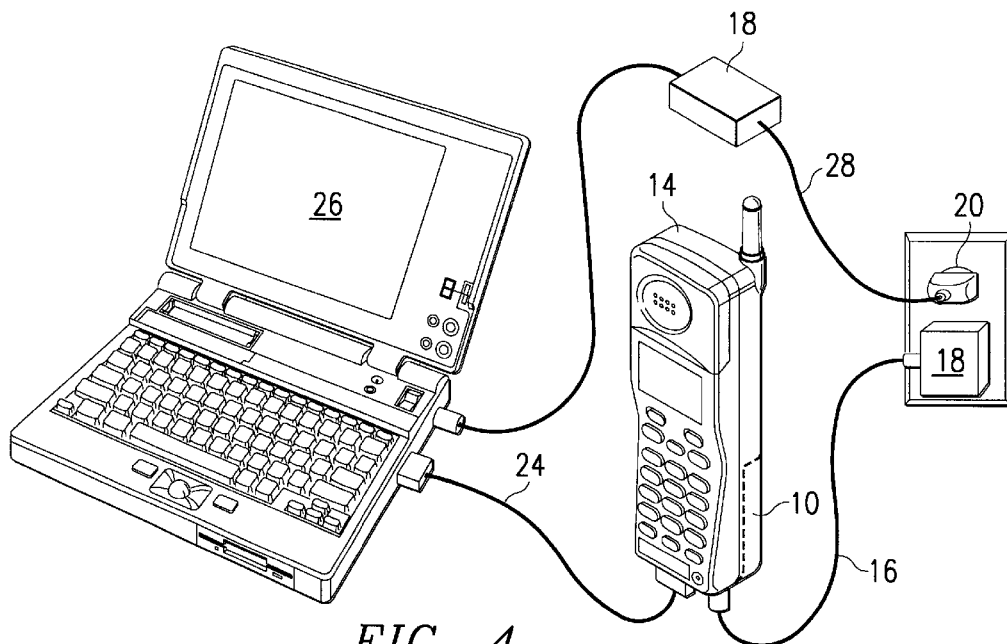


FIG. 4  
(PRIOR ART)

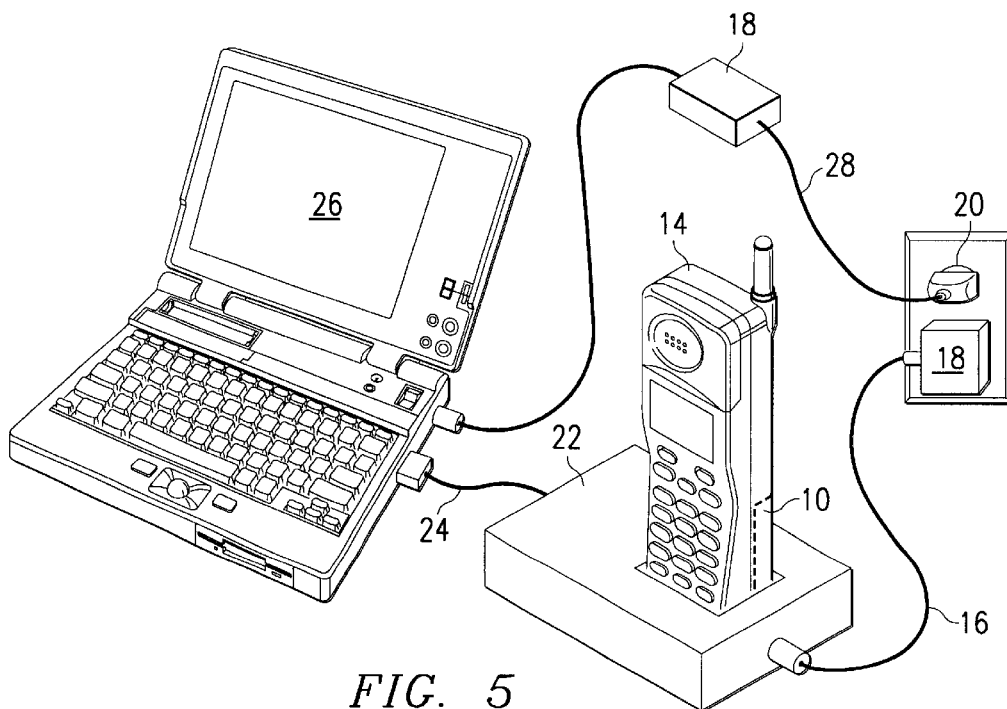


FIG. 5  
(PRIOR ART)

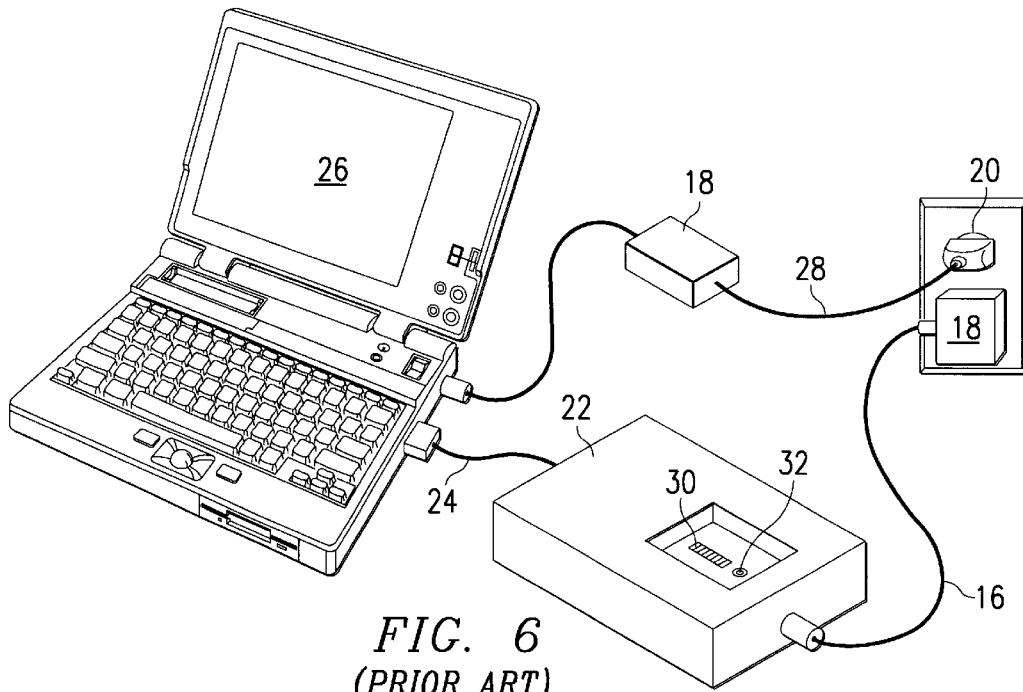


FIG. 6  
(PRIOR ART)

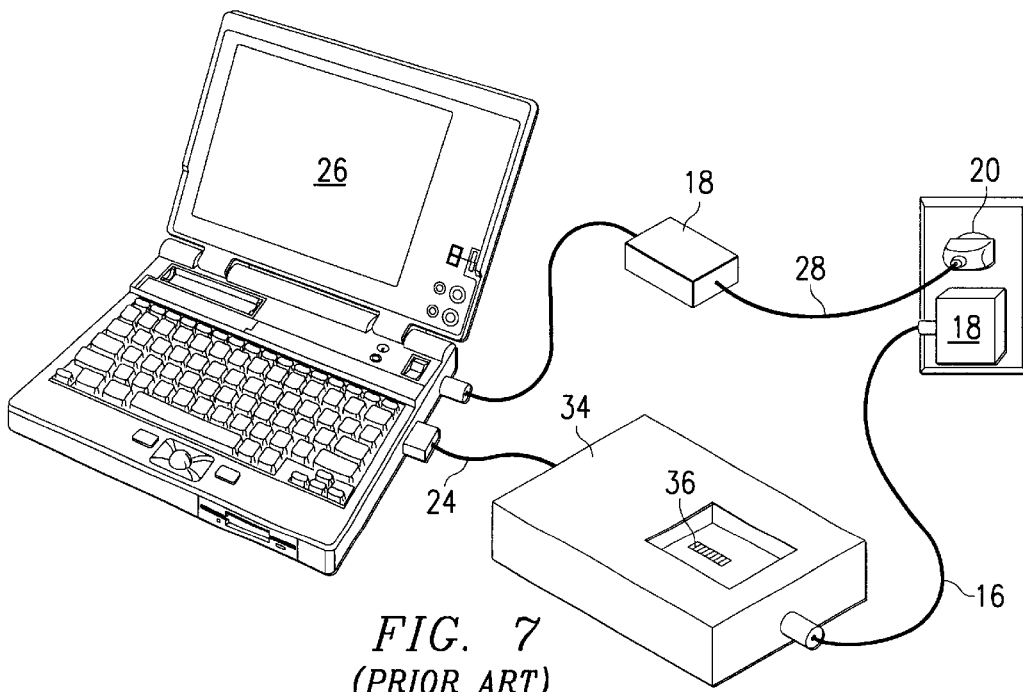
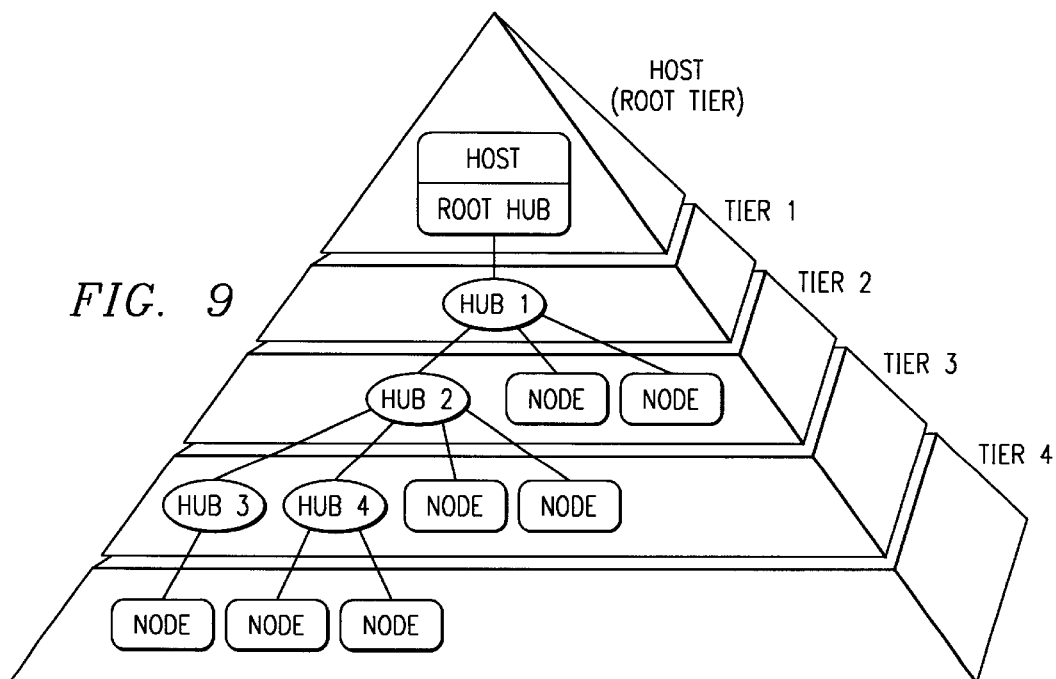
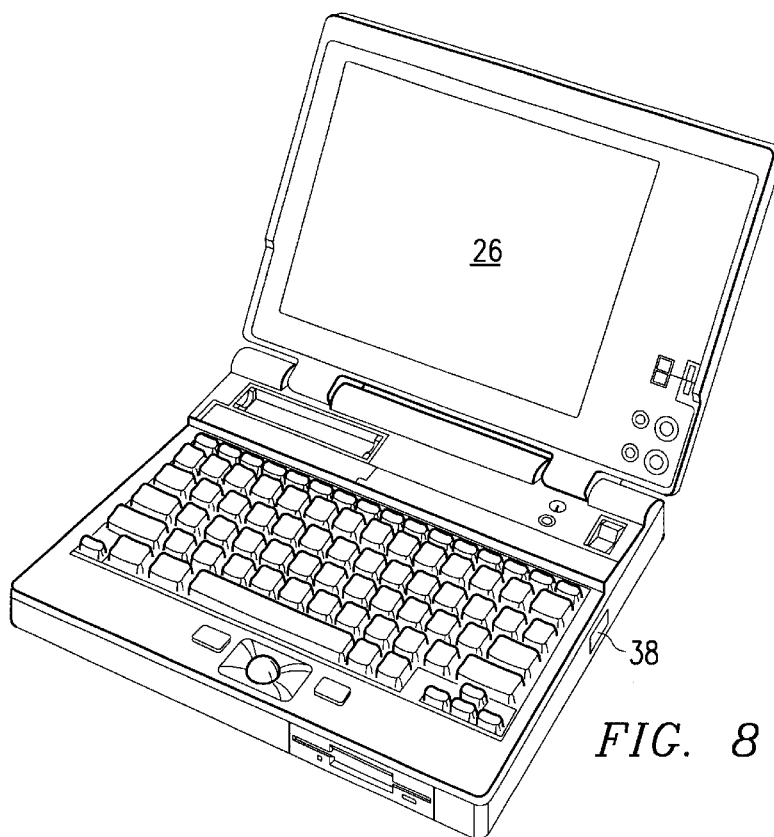


FIG. 7  
(PRIOR ART)



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