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**Nelson et al.**

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(54) **MODEM WITH FIRMWARE UPGRADE FEATURE**

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 patent is extended or adjusted under 35  
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#### Related U.S. Application Data

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(51) **Int. Cl.**<sup>7</sup> ..... **H04B 1/38; H04M 11/00**

(52) **U.S. Cl.** ..... **375/222; 379/93.05**

(58) **Field of Search** ..... 375/222, 219;  
 395/200, 200.01, 200.02, 200.09, 200.18,  
 200.64, 200.51, 750.05; 379/93.01, 93.05,  
 100.01

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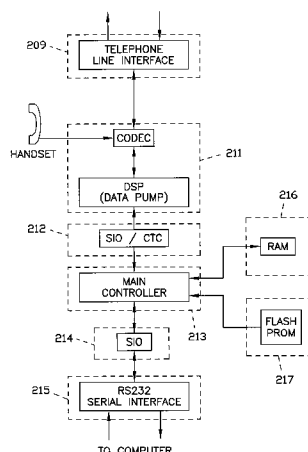
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 Woessner & Kluth, P.A.

(57) **ABSTRACT**

Updated operating code and parameters can be repro-  
 grammed into a modem system with no disassembly of the  
 modem hardware. The modem system includes a memory  
 chip in which operating code and parameters are stored. Two  
 control programs control the reprogramming of updated  
 operating code. One of the control programs is designed for  
 manufacturing and testing purposes. The other control pro-  
 gram allows remote reprogramming of updated operating  
 code or parameters from a remote location such as a cus-  
 tomer site. A user can thus remotely upgrade system firm-  
 ware with updates, bug fixes, enhancements or other new  
 releases of system operating code by downloading the  
 update over a phone line to a host PC and reprogramming  
 the memory chip of the modem over the serial port from the  
 host PC. The user can also remotely upgrade the modem  
 system firmware by directly programming the memory chip  
 of the modem without the assistance of the host PC. The  
 modem system is portable, obtaining power from a standard  
 9 volt battery. Therefore, various power saving features are  
 also incorporated into the modem system

**8 Claims, 28 Drawing Sheets**



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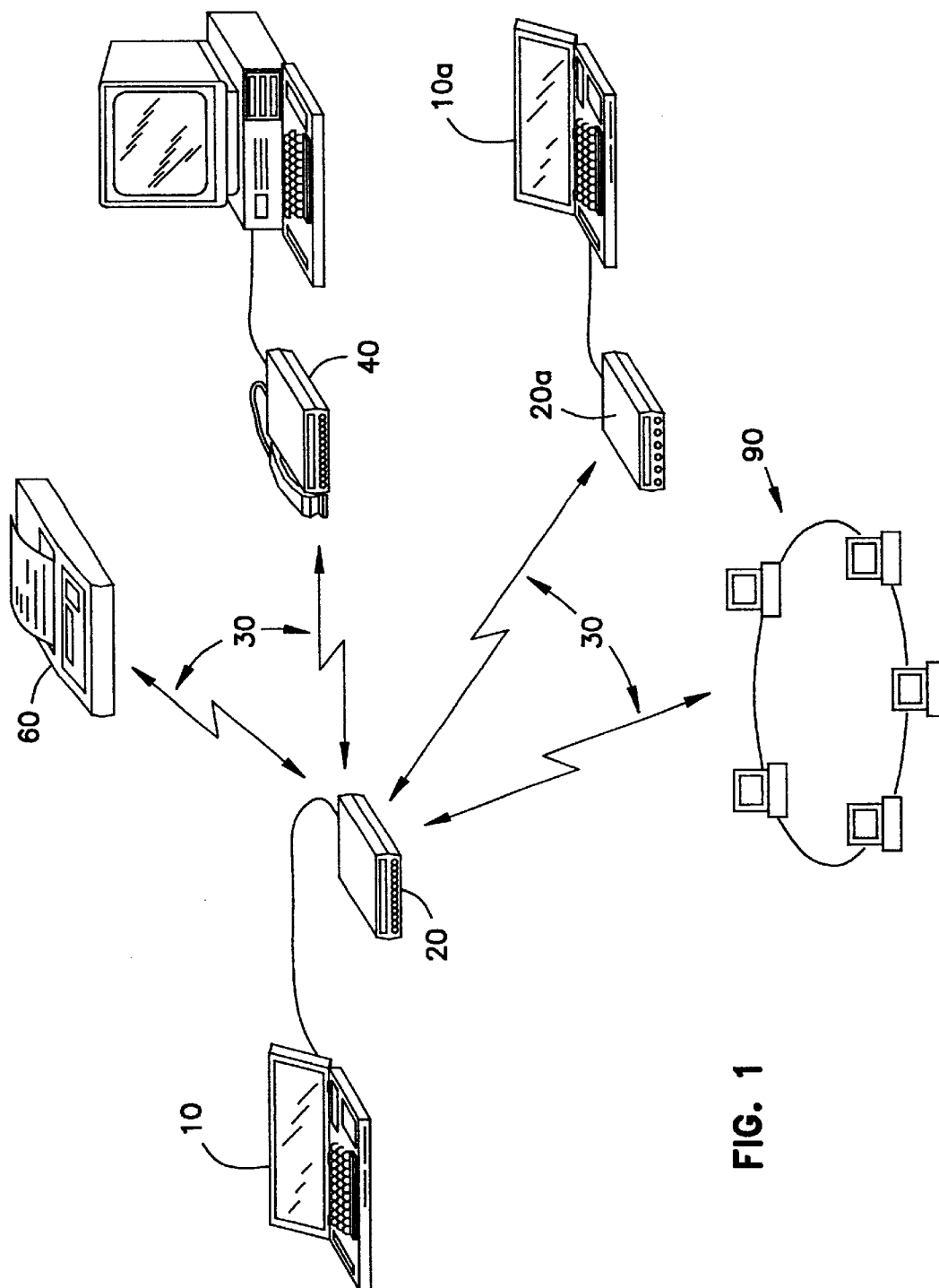


FIG. 1

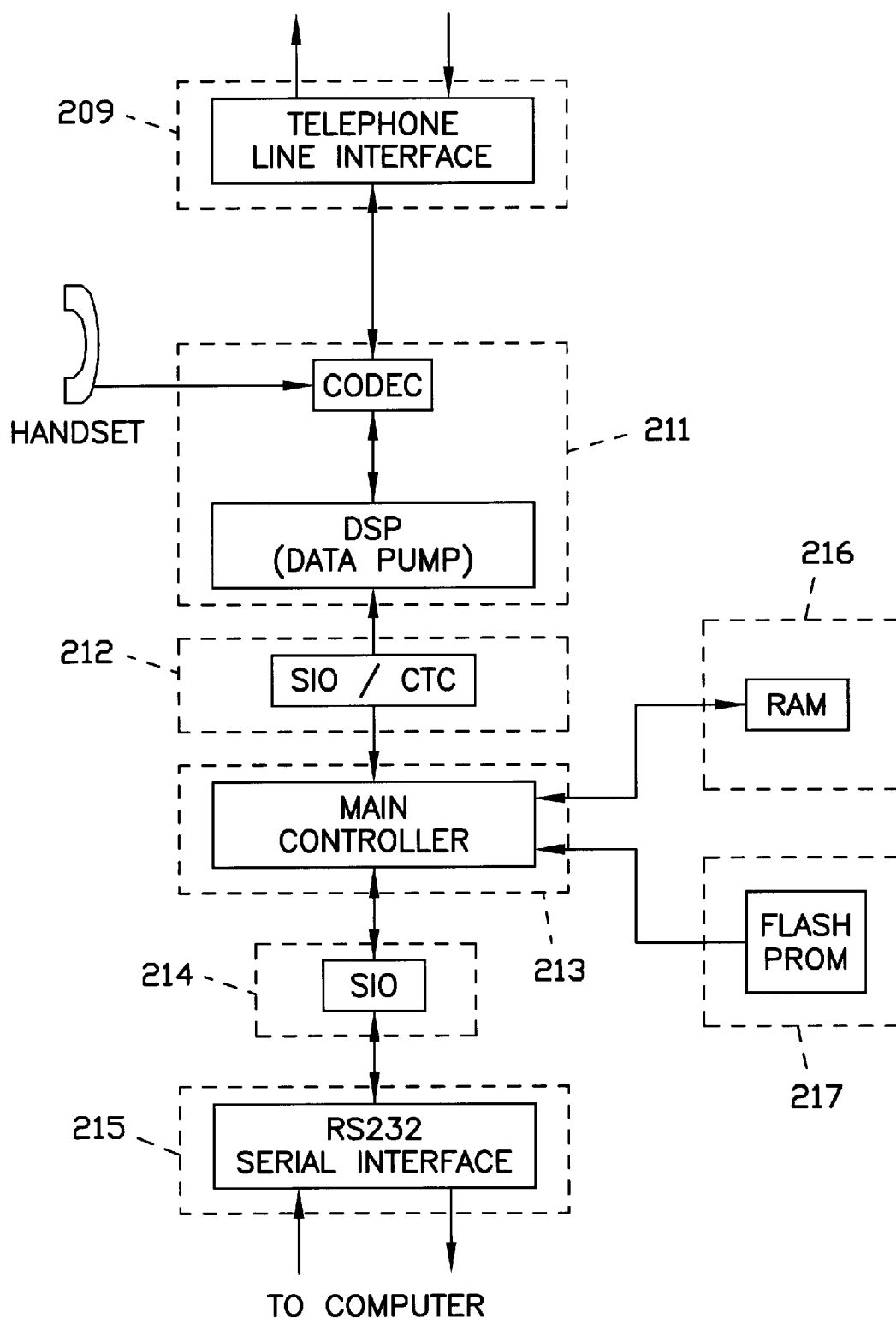


FIG. 2

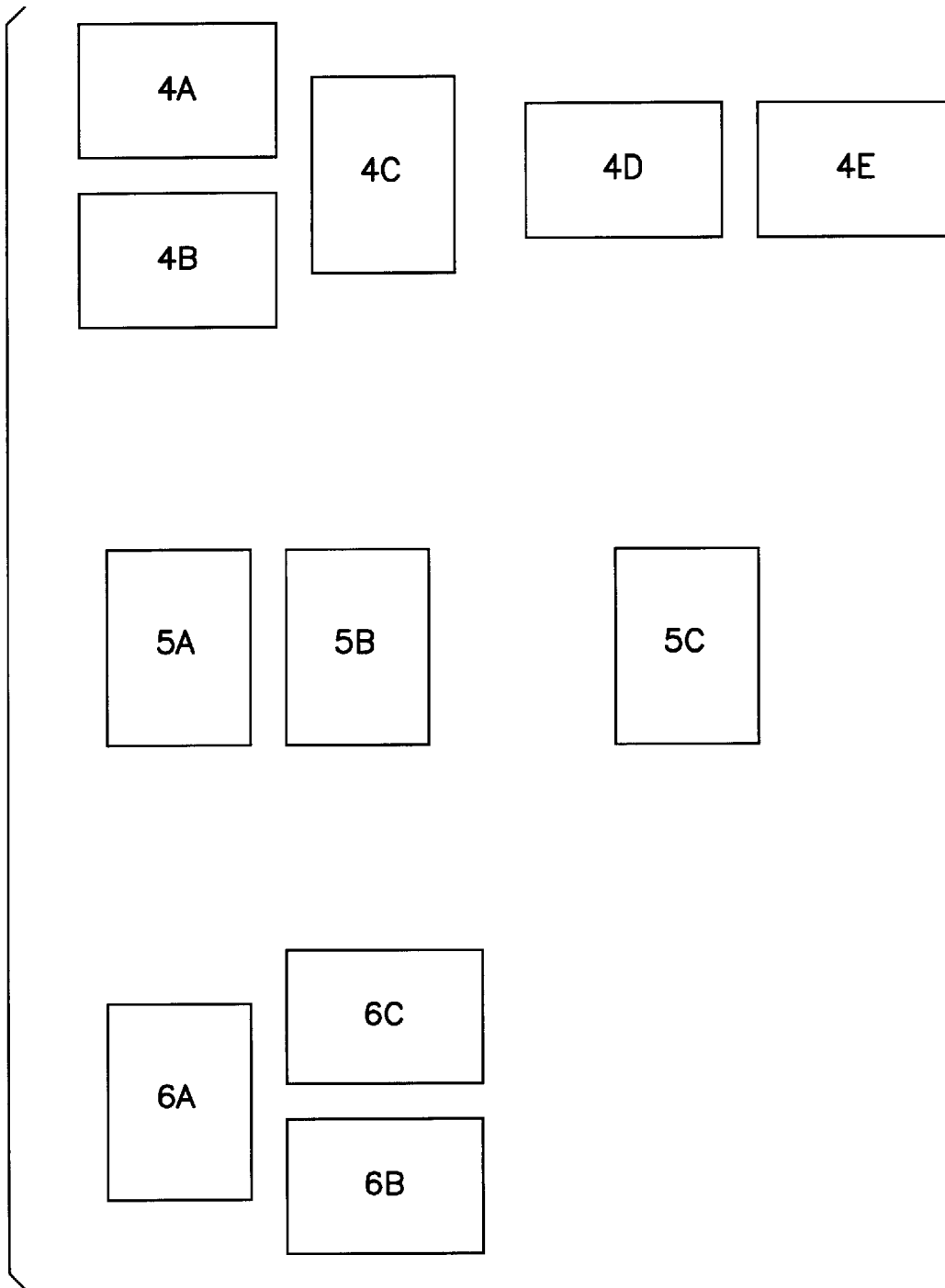


FIG. 3

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