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United States Patent [19]

Natarajan et al.

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Aug. 31, 1993

FOREIGN PATENT DOCUMENTS

2232326 12/1990 United Kingdom 370/29

OTHER PUBLICATIONS

William Stallings, "Data and Computer Communications", Macmillan Publishing Company, 1985, pp. 312-315.

Primary Examiner—Douglas W. Olms Assistant Examiner—Hassan Kizou Attorney, Agent, or Firm—Jack M. Arnold

57] ABSTRACT

A method and apparatus for conserving battery power in a wireless link adapter of a battery operated computer such as a portable laptop computer, as controlled by a scheduled multiaccess protocol. The portable computer is operable as a mobile unit in a multi-cell wireless network. The scheduled access multiaccess protocol is implemented to effectively conserve battery power by suitable control of the state of the controller, the transmitter and receiver units at the wireless link adapter by scheduling when the adapter is in a normal running mode, or a standby mode in which power is conserved.

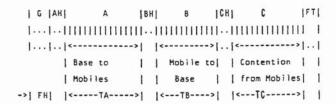
7 Claims, 9 Drawing Sheets

[54] BATTERY EFFICIENT OPERATION OF SCHEDULED ACCESS PROTOCOL [75] Inventors: Kadathur S. Natarajan, Millwood; Chia-Chi Huang, Yorktown Heights, both of N.Y. International Business Machines [73] Assignee: Corporation, Armonk, N.Y. [21] Appl. No.: 749,234 [22] Filed: Aug. 23, 1991 [51] Int. Cl.5 H04B 7/212; H04B 7/26 [52] U.S. Cl. 370/95.3; 370/85.2; 455/38.3; 455/54.1; 455/343 Field of Search 370/95.1, 95.3, 104.1, 370/29, 85.2, 85.7, 94.1; 455/53.1, 54.1, 343, 38.3; 340/825.44, 311.1; 379/58 [56] References Cited U.S. PATENT DOCUMENTS 4,794,649 12/1988 Fujiwara 455/343 4,897,835 1/1990 Gaskill et al. 370/94.1 4,995,099 2/1991 Davis 340/825.44 5,144,296 9/1992 DeLuca et al. 455/343

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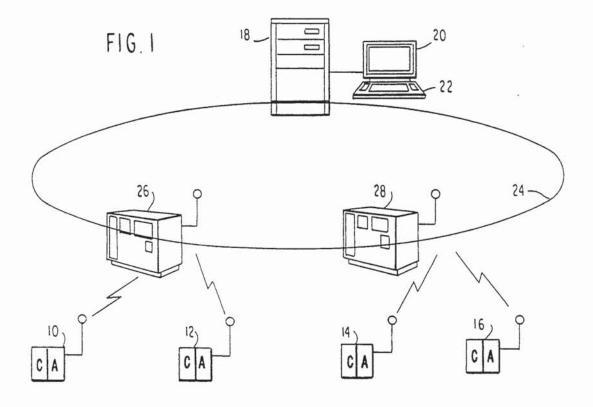
MOBILE STATION

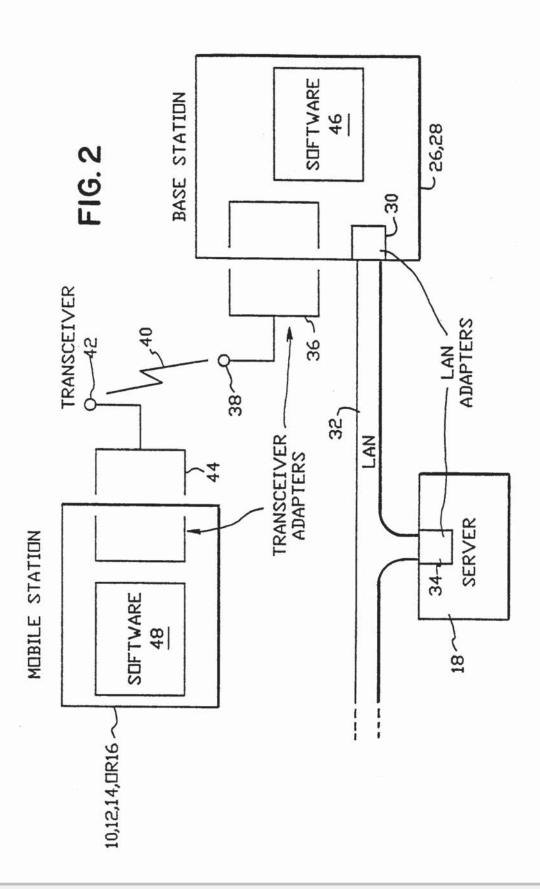
TRANSCEIVER 42 10,12,14, OR16 -SOFTWARE 48 BASE STATION 44 38 TRANSCEIVER **ADAPTERS** 36 SOFTWARE 32 46 LAN 30 C 26,28 34 LAN **ADAPTERS** SERVER





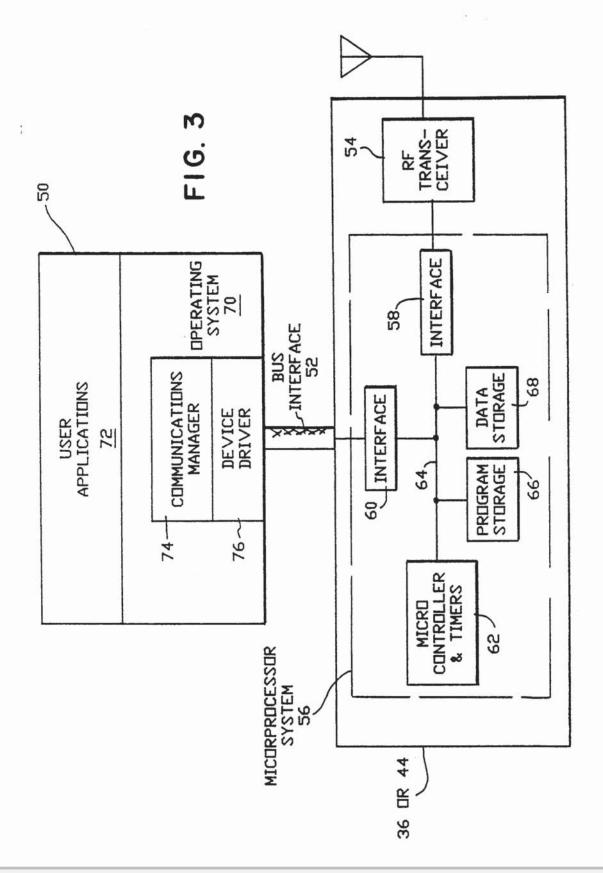
Aug. 31, 1993



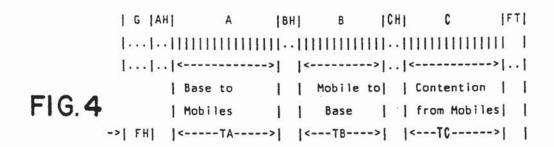




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FIG. 5

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1 00010001100000 ************ 1000000 1
| <-----> |
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|...|..|<----->| |<----->|..|<----->|..|
            | Base to | | Mobile to | | Contention | |
            | Mobiles | | Base | | from Mobiles | |
FIG. 6
        | G | AH | A | BH |
                        В
                               ICHI C
        RECEIVER ALLOCATIONS 51=3, 52=5, 53=3, 54=4
       ->| FH| | <-- TA = 15 ->| | <--TB = 14-->| | <---TC ----->| |
```

```
G AH A BH B CH
       FIG. 7
                  | |R1 |R2 | R3 | |
                  | | NO | NO | NO | |
       TRANSMITTER ALLOCATIONS R1=4, R2=3, R3=7
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