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(54) **POWER SAVING VIA PHYSICAL LAYER ADDRESS FILTERING IN WLANS**

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(57) **ABSTRACT**

A system and method is described for saving power in a wireless network, using a physical layer address filtering protocol based on a partial address subset of the complete destination MAC address. The system comprises a PHY layer filtering protocol for generating the partial address and writing the partial address into a PHY layer header portion (e.g., PLCP header) of a sending station, or reading the partial address from the PHY layer header portion upon transmission of each frame. A receiving station receives and decodes these PHY layer header portion bits, in accordance with the protocol, and compares whether the subset of bits match that of the stations' own partial address. If a station finds a match, the station then continues further decoding the frame at PHY layer and send the complete frame to the MAC layer for further processing. The stations that do not have a match will not activate their MAC layer components. Thus, the stations of the network will avoid wasting power decoding a significant portion of the complete frame of other stations of the wireless local area networks and unnecessary MAC layer processing. When group addressed, control/management frames or other such frames are detected at the sending station, the address filtering protocol may be "disabled" using a partial address containing a predetermined value (e.g., all zeros).
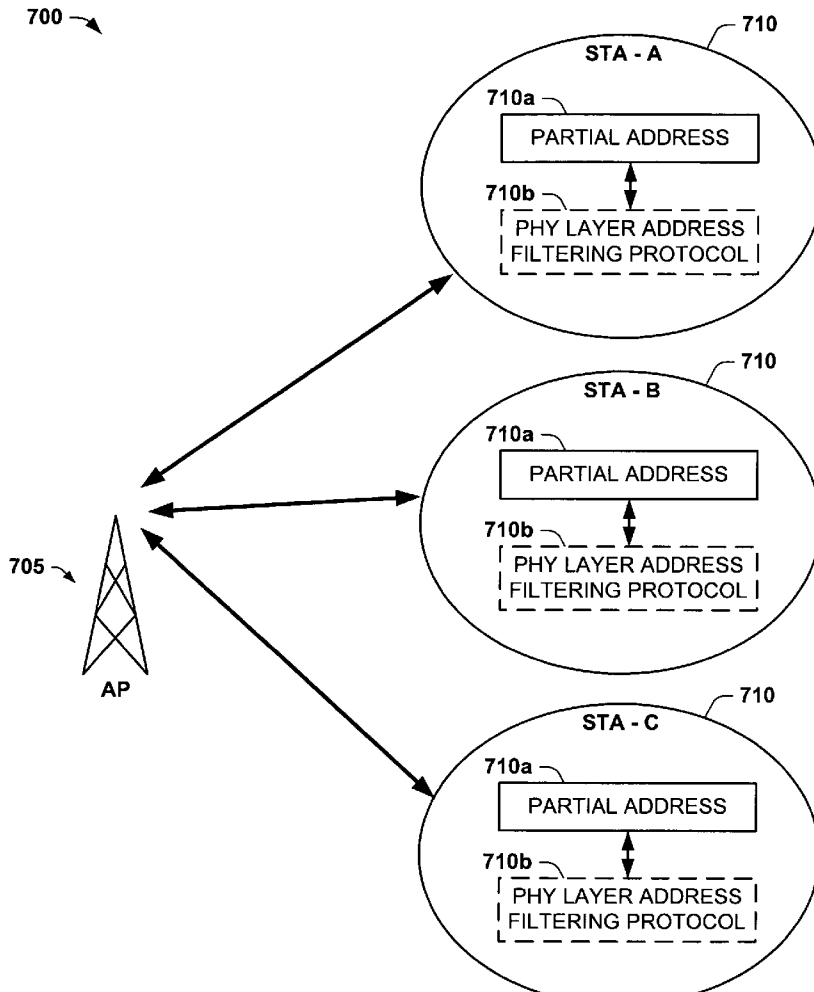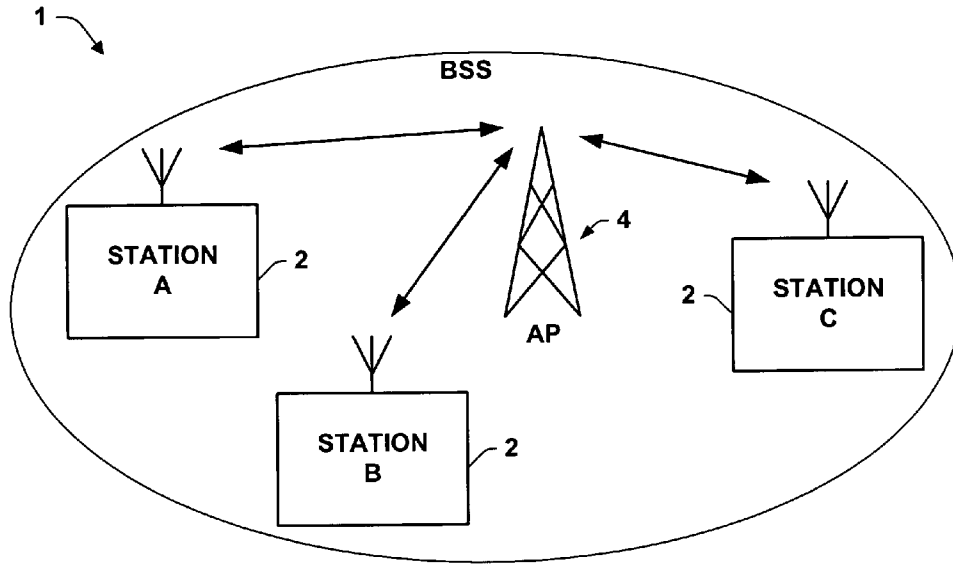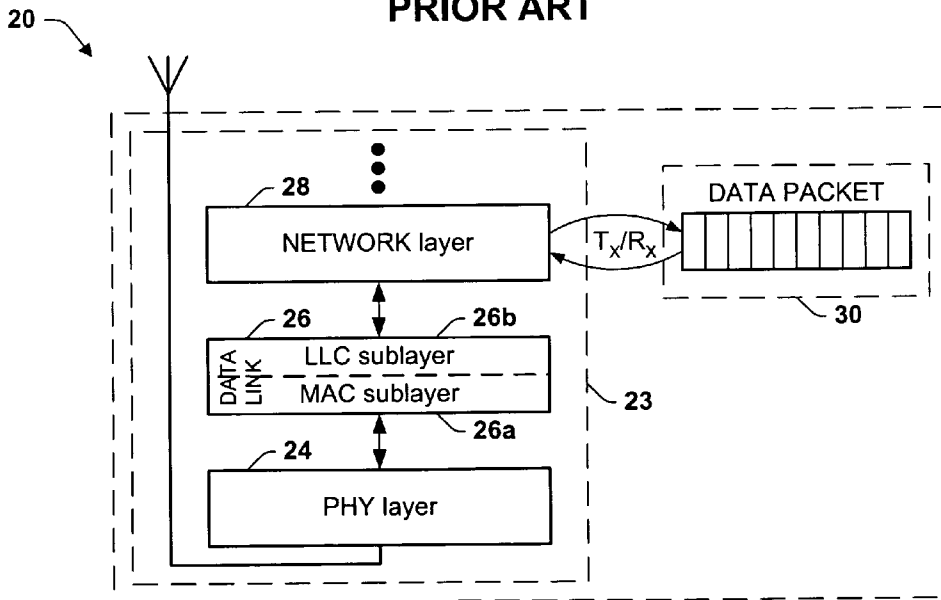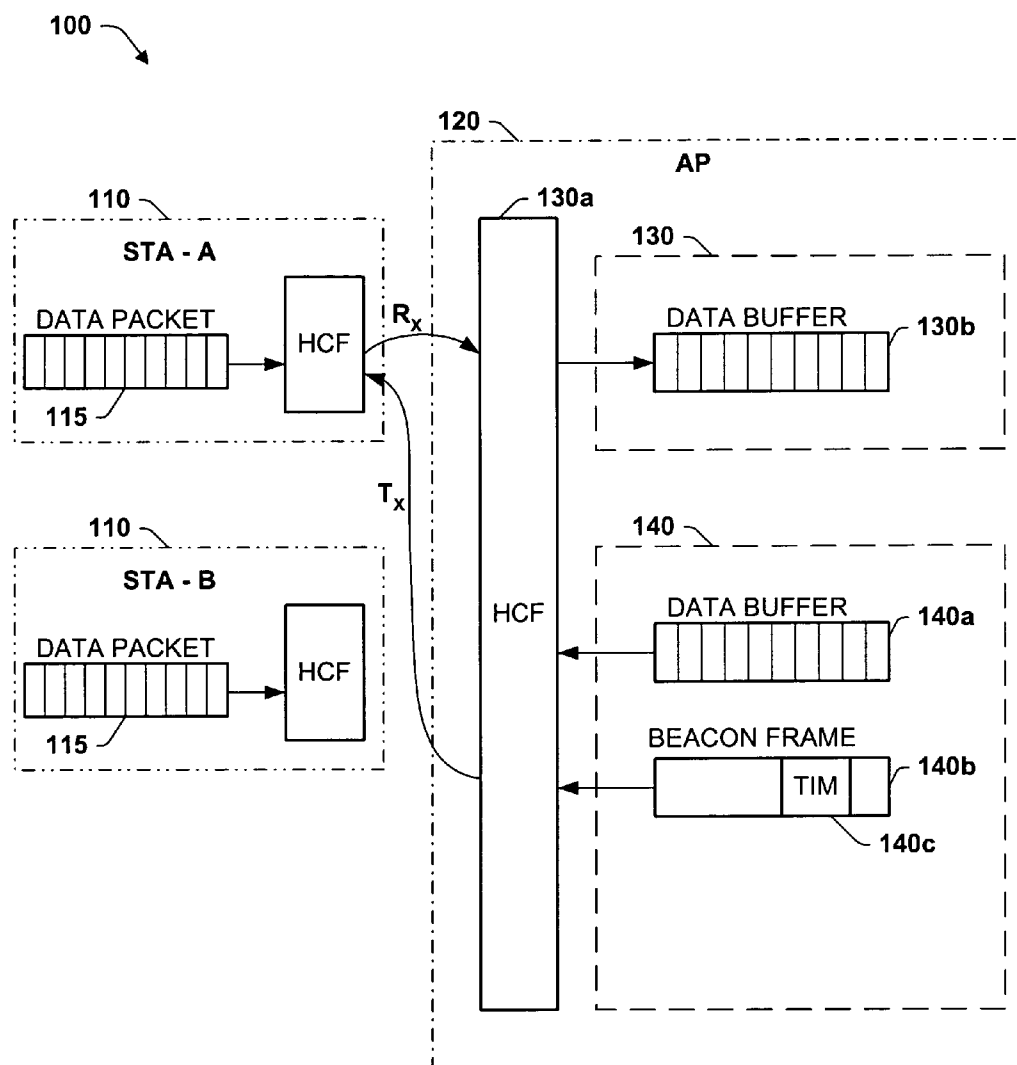
**FIG. 1**
**PRIOR ART**



**FIG. 2**
**PRIOR ART**

**FIG. 3**

400

## Basic Frame Format

| 405 | 410 | 415 | 420 | 425 |
|-----|-----|-----|-----|-----|
| PREAMBLE | PHY HEADER | MAC HEADER | DATA | FSC (CRC) |

430

| MAC Frame (PHY Payload) |
|---|

## FIG. 4

430

## MAC Frame Format

| 431 | 435 | 440 | 445 | 450 | 460 | 455 | 420 | 425 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Frame Control | Duration/ ID | Addr 1 | Addr 2 | Addr 3 | Sequence Control | Addr 4 | Frame Body | FCS |
| Octets: 2 | 2 | 6 | 6 | 6 | 2 | 6 | 0-2312 | 4 |

415

| MAC Header |
|---|
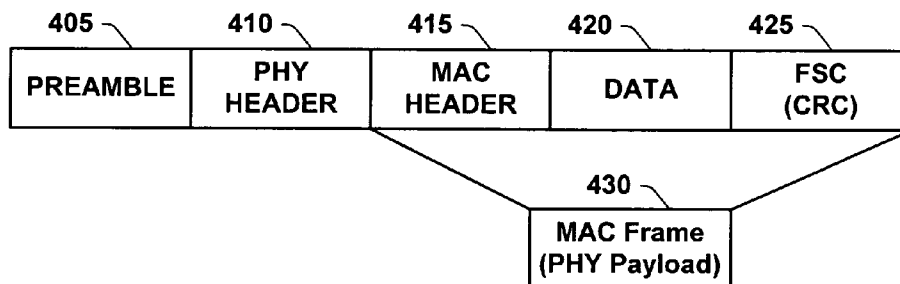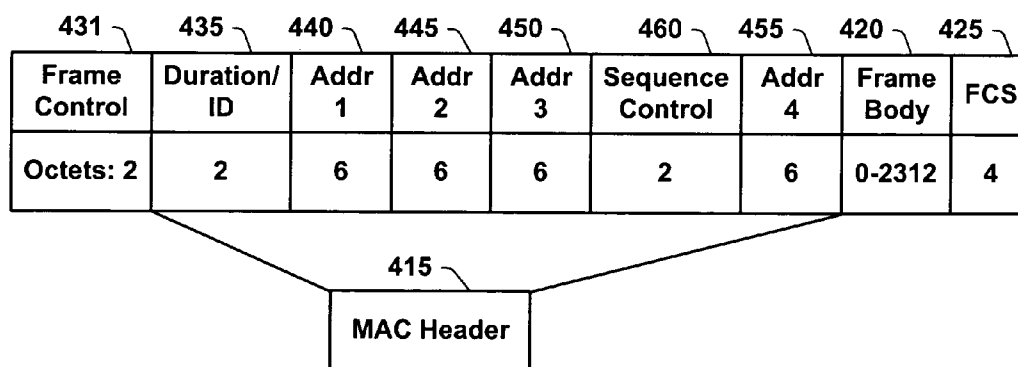
## FIG. 5

## IEEE 802.11b PHY Frame Format

624

630

| b0 | b1 | b2 | b3 | b4 | b5 | b6 | b7 |
|---|---|---|---|---|---|---|---|
| Reserved | Reserved | locked clocks bit 0 = not 1 = locked | Mod. selection bit 0 = CCK 1 = PBCC | Reserved | Reserved | Reserved | Length extension bit |

| 621 | 622 | 623 | 624 | 625 | 626 |
|---|---|---|---|---|---|
| SYNC 128 bits | SFD 16 bits | SIGNAL 8 bits | SERVICE 8 bits | LENGTH 16 bits | CRC 16 bits |

| 611 | 612 | 613 |
|---|---|---|
| PLCP PREAMBLE 144 bits | PLCP HEADER 48 bits | PSDU |

610

# FIG. 6

# DOCKET ALARM
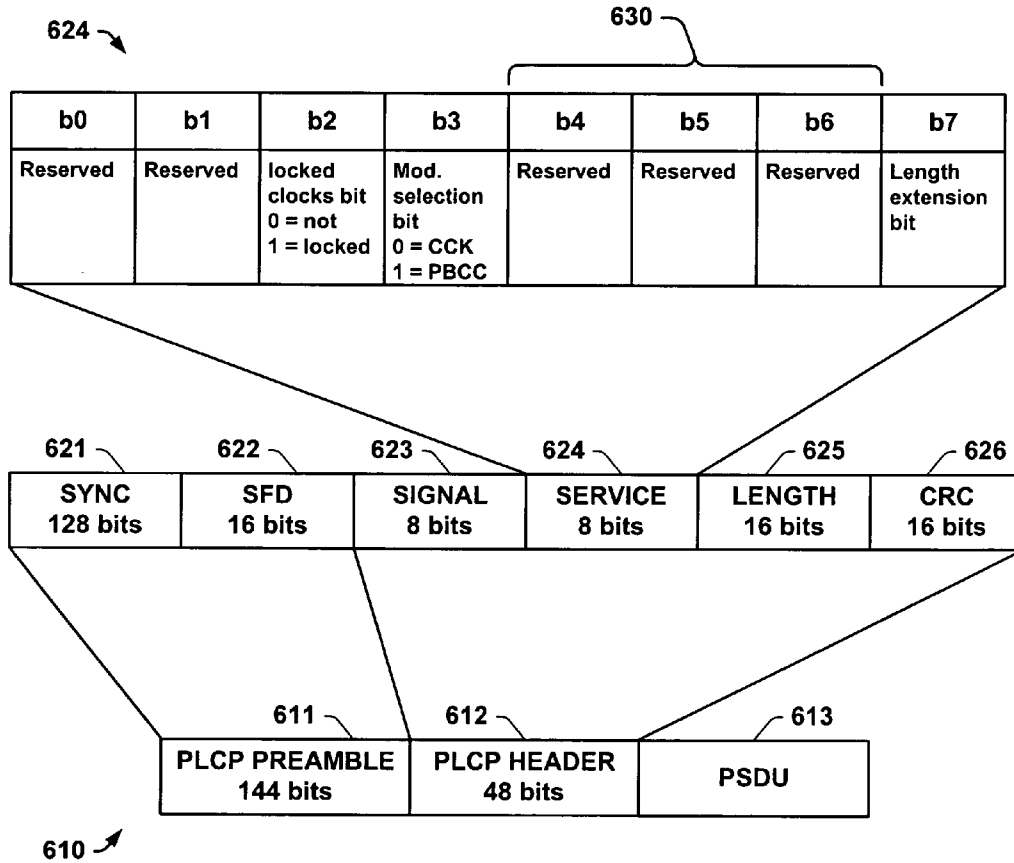
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