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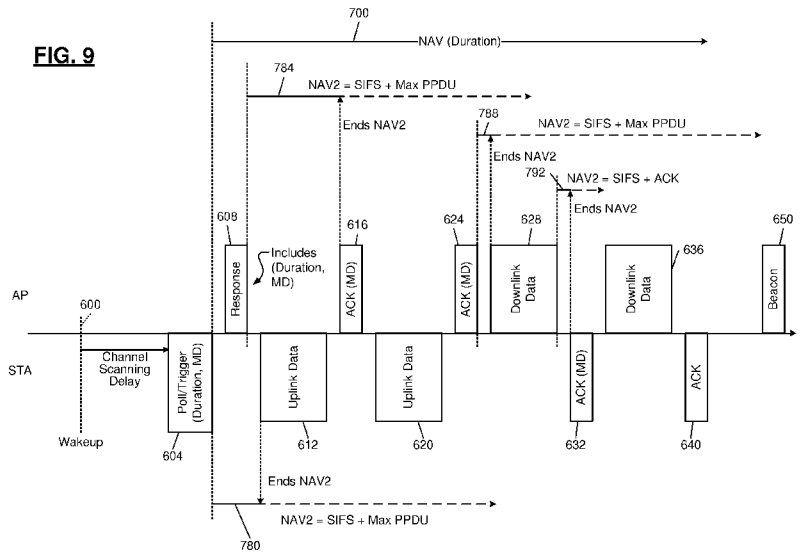
(54) **Title**: METHOD AND APPARATUS FOR RESTRICTING CHANNEL ACCESS TO A WIRELESS STATION OPERATING IN ACCORDANCE WITH A POWER SAVING SCHEME

FIG. 9



(57) **Abstract**: A wireless station includes a transceiver configured to wirelessly receive networking frames over a wireless medium, and a channel access counter configured to track a time period and signal that the time period has expired. The time period begins in response to a first networking frame of the networking frames. The first networking frame is addressed to a receiver other than the wireless station. A length of the time period is based on a first length in response to a type of the first networking frame being an acknowledgment frame type. The length of the time period is based on a second length in response to the type of the first networking frame being a data frame type. The transceiver is configured to wait to access the wireless medium until after the channel access counter signals that the time period has expired.

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AMENDED CLAIMS
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What is claimed is:

1. A wireless station comprising:

a transceiver configured to wirelessly receive networking frames over a wireless medium; and

a channel access counter configured to track a time period and signal that the time period has expired, wherein

the time period begins in response to a first networking frame of the networking frames,

the first networking frame is addressed to a receiver other than the wireless station,

a length of the time period is based on a first length in response to a type of the first networking frame being an acknowledgment frame type,

the length of the time period is based on a second length in response to the type of the first networking frame being a data frame type,

the length of the time period is independent of any duration value specified in the first networking frame,

the transceiver is configured to wait to access the wireless medium until after the channel access counter signals that the time period has expired, and

the channel access counter is configured to selectively signal that the time period has expired in response to the transceiver receiving, during the time period, a second networking frame of the networking frames.

2. The wireless station of claim 1, wherein the first length is longer than the second length.

3. The wireless station of claim 2, wherein the first length is based on a transmission time of a maximum length data frame.

4. The wireless station of claim 3, wherein:

the first length is based on a sum of a short interframe space (SIFS) and the transmission time, and

the maximum length data frame is a maximum length physical layer convergence procedure (PLCP) protocol data unit (PPDU) frame.

5. The wireless station of claim 2, wherein the second length is based on a predetermined transmission time for an acknowledgement frame.

6. The wireless station of claim 5, wherein the second length is based on a sum of a short interframe space (SIFS) and the predetermined transmission time for the acknowledgement frame.

7. The wireless station of claim 1, wherein the channel access counter comprises a counter configured to count down to zero.

8. The wireless station of claim 7, wherein the channel access counter is configured to signal that the time period has expired when the counter reaches zero.

9 The wireless station of claim 1, wherein the channel access counter is configured to signal that the time period has expired in response to (i) the type of the first networking frame being the data frame type and (ii) a type of the second networking frame being the acknowledgement frame type.

10. The wireless station of claim 1, wherein the channel access counter is configured to signal that the time period has expired in response to (i) the type of the first networking frame being the acknowledgement frame type and (ii) a type of the second networking frame being the data frame type.

11. The wireless station of claim 1, wherein the channel access counter is configured to omit tracking the time period in response to the type of the first networking frame being the acknowledgement frame type and a more data indication within the first networking frame indicating that more data is not expected.

12. The wireless station of claim 1, further comprising a network allocation vector counter configured to count down to zero, wherein the network allocation vector counter is set to a value based on a duration field in the first networking frame, and wherein the transceiver is configured to wait to access the wireless medium until after the network allocation vector counter reaches zero.

13. The wireless station of claim 12, wherein the network allocation vector counter is configured to change directly to zero in response to the transceiver receiving a contention-free end (CF-END) frame.

14. A method of operating a wireless station, the method comprising:

wirelessly receiving networking frames over a wireless medium;

tracking a time period, wherein

the time period begins in response to a first networking frame of the networking frames,

the first networking frame is addressed to a receiver other than the wireless station,

a length of the time period is based on a first length in response to a type of the first networking frame being an acknowledgment frame type,

the length of the time period is based on a second length in response to the type of the first networking frame being a data frame type, and

the length of the time period is independent of any duration value specified in the first networking frame;

generating an expiration signal in response to the time period expiring;

selectively generating the expiration signal in response to receiving, during the time period, a second networking frame; and

waiting to access the wireless medium until the expiration signal has been generated.

15. The method of claim 14, wherein the first length is longer than the second length.

16. The method of claim 15, wherein the first length is based on a transmission time of a maximum length data frame.

17. The method of claim 16, wherein:

the first length is based on a sum of a short interframe space (SIFS) and the transmission time, and

the maximum length data frame is a maximum length physical layer convergence procedure (PLCP) protocol data unit (PPDU) frame.

18. The method of claim 15, wherein the second length is based on a predetermined transmission time for an acknowledgement frame.

19. The method of claim 18, wherein the second length is based on a sum of a short interframe space (SIFS) and the predetermined transmission time for the acknowledgement frame.

20. The method of claim 14, wherein the tracking the time period includes decrementing a counter to zero starting from a value based on the time period.

21. The method of claim 20, wherein the generating the expiration signal is performed in response to the counter reaching zero.

22. The method of claim 14, wherein the selectively generating the expiration signal comprises generating the expiration signal in response to (i) the type of the first networking frame being the data frame type and (ii) a type of the second networking frame being the acknowledgement frame type.

23. The method of claim 14, wherein the selectively generating the expiration signal comprises generating the expiration signal in response to (i) the type of the first networking frame being the acknowledgement frame type and (ii) a type of the second networking frame being the data frame type.

24. The method of claim 14, further comprising, in response to the type of the first networking frame being the acknowledgement frame type and a more data indication within the first networking frame indicating that more data is not expected, omitting tracking the time period.

25. The method of claim 14, further comprising:

decrementing a network allocation vector counter to zero from a value based on a duration field in the first networking frame; and

waiting to access the wireless medium until after the network allocation vector counter reaches zero.

26. The method of claim 25, further comprising decreasing the network allocation vector counter directly to zero in response to receiving a contention-free end (CF-END) frame.