Patent Owner NTT's Demonstratives

Mediatek Inc. and Mediatek USA, Inc. (Petitioner)

v.

Nippon Telegraph and Telephone Corp. (Patent Owner)

Case IPR2020-01404

Patent 7,280,551

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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Issues Before the Board

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    - Ground 1 – Shpak does **NOT** disclose a "mandatory channel" (DI at 24)
    - Ground 3 – Bugeja does **NOT** disclose a "mandatory channel" (DI at 38); Bugeja does not disclose claims 2 and 6 (DI at 40-41)
    - Ground 4 – Relies on Shpak and Bugeja for "mandatory channel"
  - Ground 2 – Shpak-Lundby → institution granted on this Ground. Other Grounds instituted based on *SAS Inst., Inc. v Iancu* (2018).

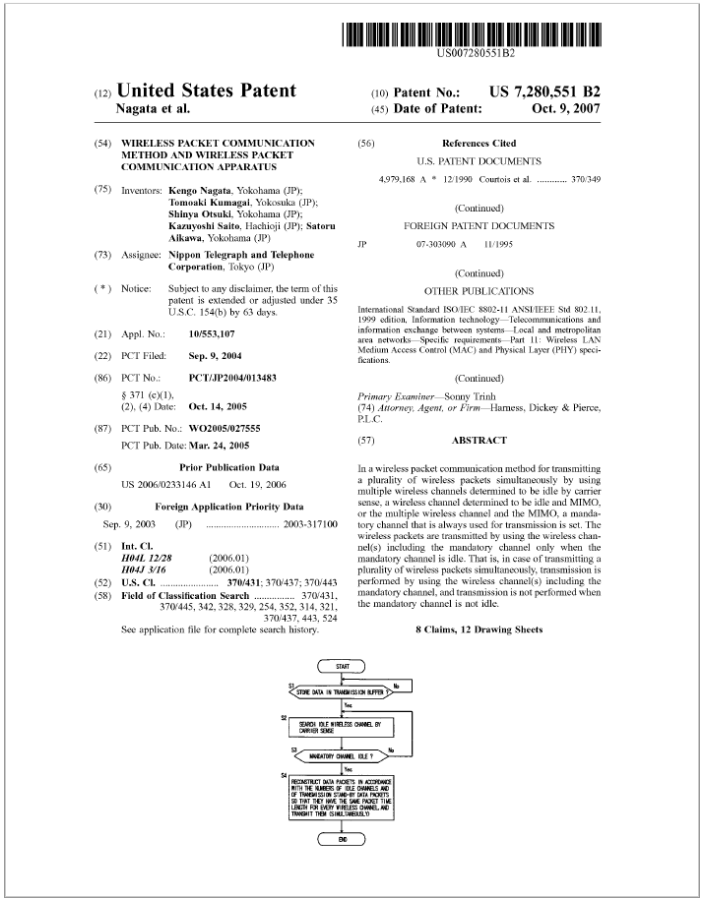
Issues Before the Board

- Issues Currently Presented:
  - "Mandatory channel" --"one channel in a wireless multichannel communication system over which transmission must occur before transmission over the other wireless channels" (DI at 21)
    - **Proposed modification:** "one channel in a wireless multichannel communication system whose idle state determines whether there can be a transmission over the other channels" (POR at 11-19)
  - Grounds impacted by construction:
    - Ground 1 – Shpak does **NOT** disclose a "mandatory channel"
    - Ground 3 – Bugeja does **NOT** disclose a "mandatory channel" or claims 2 and 6
    - Ground 4 – Relies on Shpak and Bugeja for "mandatory channel"
    - The Board should reject Grounds 1, 3, and 4 based at least on the preliminary construction or NTT's proposed modification.
    - Further, Bugeja does not disclose claims 2, 6. Ground 4 should be rejected to the extent dependent on Bugeja.
  - Ground 2 – Shpak-Lundby fails because NEITHER teaches preventing transmission in a multichannel system

II. U.S. Patent No. 7,280,551

II. U.S. Patent No. 7,280,551

- "Wireless packet communication method and wireless packet communication apparatus"
- Relates to:
  - Transmitting wireless packets "using multiple wireless channels determined to be idle by carrier sense, a wireless channel determined to be idle and MIMO, or the multiple wireless channel and the MIMO"
  - Addresses problems of leakage that might impact throughput of multichannel systems, by setting a "mandatory channel," such that "packets are transmitted by using the wireless channel(s) including the mandatory channel ***only when*** the mandatory channel is idle"



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(12) **United States Patent**
Nagata et al.

(10) **Patent No.: US 7,280,551 B2**
(45) **Date of Patent: Oct. 9, 2007**

(54) **WIRELESS PACKET COMMUNICATION METHOD AND WIRELESS PACKET COMMUNICATION APPARATUS**

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(73) Assignee: **Nippon Telegraph and Telephone Corporation**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 63 days.

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§ 371 (c)(1),
(2), (4) Date: **Oct. 14, 2005**

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PCT Pub. Date: **Mar. 24, 2005**

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(51) **Int. Cl.**
H04L 12/28 (2006.01)
H04J 3/16 (2006.01)

(52) **U.S. Cl.** **370/431**; 370/437; 370/443

(58) **Field of Classification Search** 370/431, 370/445, 342, 328, 329, 254, 352, 314, 321, 370/437, 443, 524
See application file for complete search history.

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(Continued)

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(57) **ABSTRACT**

In a wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a wireless channel determined to be idle and MIMO, or the multiple wireless channel and the MIMO, a mandatory channel that is always used for transmission is set. The wireless packets are transmitted by using the wireless channel(s) including the mandatory channel only when the mandatory channel is idle. That is, in case of transmitting a plurality of wireless packets simultaneously, transmission is performed by using the wireless channel(s) including the mandatory channel, and transmission is not performed when the mandatory channel is not idle.

8 Claims, 12 Drawing Sheets

II. U.S. Patent No. 7,280,551

- Simultaneous transmission can enhance communications **throughput**. *E.g.*, multiple channels used at once > single channel.
- The Problem Relates to ***Multichannel*** Systems (POR at 4-6):
  - "In the case where center frequencies of **multiple wireless channels used at the same time** are close to each other, an effect of power leakage **from one wireless channel to a frequency region used by another wireless channel** becomes large." *Id.* at 2:26-30.
  - Note the language used: **NOT** addressing "power leakage" in general, but ***specifically*** its effect when "center frequencies of multiple wireless channels used at the same time" → i.e., a ***multichannel problem*** (Surreply at 20-21)

FIG. 15

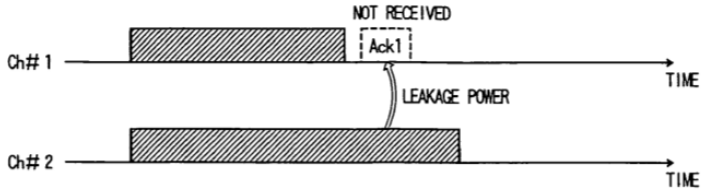
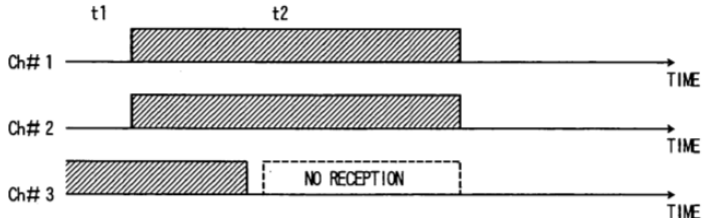


FIG. 16



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- Fig. 15:
  - Different packet lengths, transmitted from "***a*** transmit-side STA" to "***a*** receive-side STA" on Ch1, Ch2
  - Leakage from Ch2 to Ch1 → Ack for the packet on Ch 1 not received
  - As a result, "***throughput*** cannot be improved even if simultaneous transmission is performed using ***multiple wireless channels*** at the same time." *Id.* at 2:48-51.
- Fig. 16:
  - Similar to 15, but same packet lengths
  - Leakage from Ch2 to Ch3 prevents receipt of packet even after Ch3 becomes idle
  - "However, ***the transmit-side STA is transmitting*** the wireless packets by ***using the wireless channels #1 and #2*** and therefore ***cannot receive*** the wireless packet ***on the wireless channel #3…"*** → Same STA that is using Chs 1 and 2, multichannel system

FIG. 15

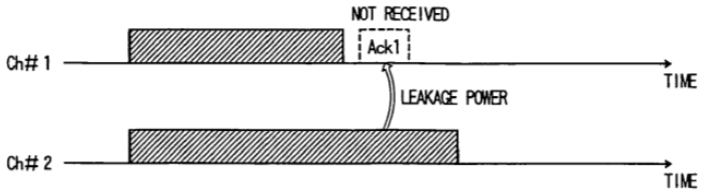
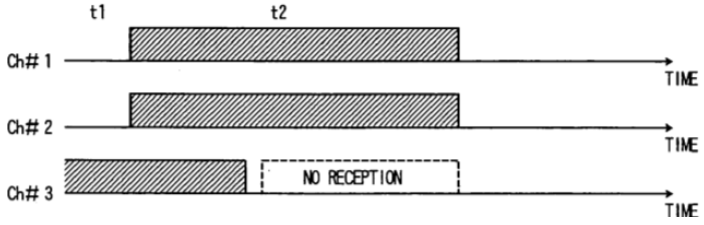


FIG. 16



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- The Solution: setting a "mandatory channel" that ***prevents transmission*** on otherwise idle channels in circumstances where leakage could happen
- Figs. 1 and 2: Ch1 is "mandatory."
- Fig. 1: Two items to check → S2: search for idle channels, ***and*** S3: check state of ***mandatory channel*** before deciding to transmit
- Fig. 2: when Ch1 busy, ***no transmission*** on Ch3 ***even when idle***

FIG. 2

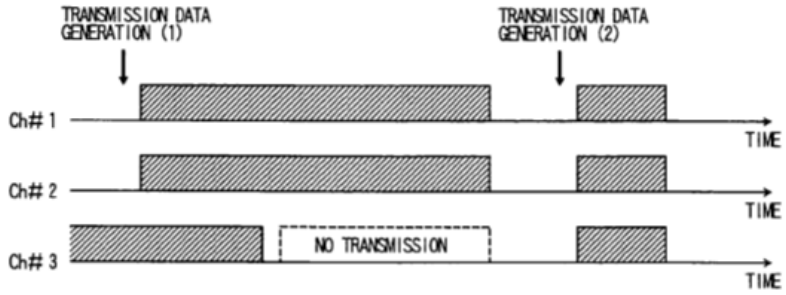
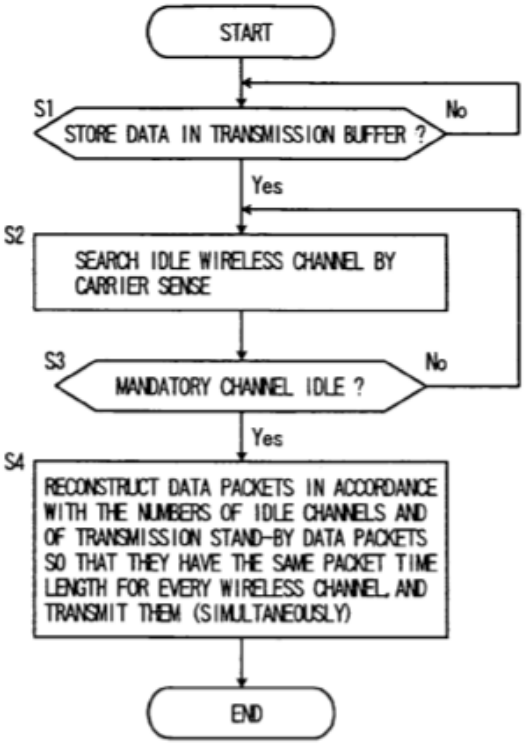


FIG. 1



II. U.S. Patent No. 7,280,551

- "Even when [Ch3] becomes idle, another STA does not perform transmission because the [Ch1] set as the mandatory channel is busy." *Id.* at 6:33-35
- "Thus, it is possible to ***avoid a situation*** that the transmit-side STA cannot receive a wireless packet addressed ***to an own*** STA…Thus, ***throughput*** can be improved." *Id.* at 11:67-12:6.

FIG. 2

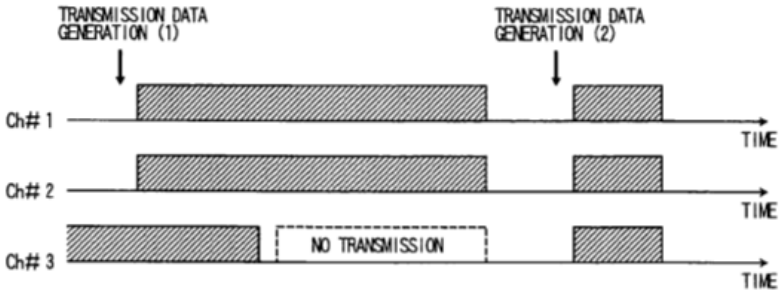
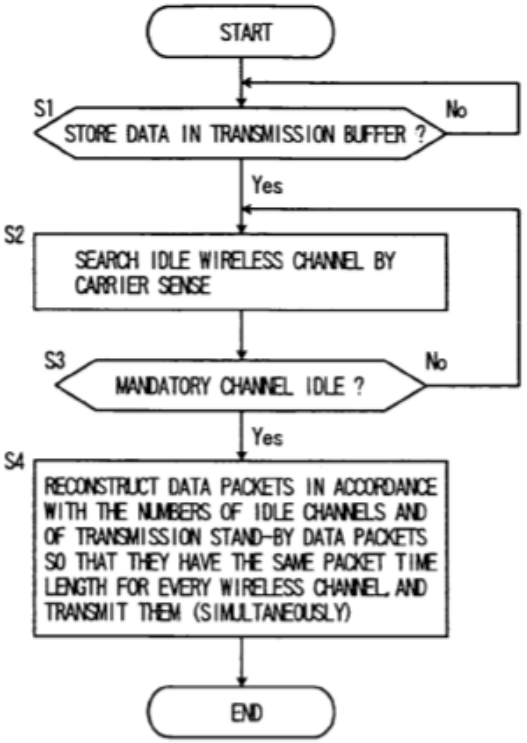


FIG. 1



II. U.S. Patent No. 7,280,551

- There is **NO DISPUTE** that the '551 Patent ***prevents transmission*** on channels other than the mandatory channel. *E.g.*,:
  - NTT: POR at 6-11, Geier Decl. at ¶59,61-62, 74-75
  - Mediatek:
    - "When Ch#3 subsequently becomes idle, it **cannot be used for packet transmission**—'no transmission'—**because the mandatory channel—i.e., Ch#1—is not also idle**." Pet. at 14
    - Q: "Is it fair to say that the method shown in Figs. 1 and 2 of the patent results **in preventing transmission** to otherwise idle channels when the mandatory channel…is not idle?" **A: "From the same transmitter that's true**." → POR at 10, citing Williams2 at 7:12-18.
    - "[A] test is to be made of the idle nature of the mandatory channel, and **then a decision to transmit is made based on that mandatory channel** being idle…[I]f the mandatory channel is occupied, **then there will be no transmissions**.." POR at 18, citing Williams1 at 28:25-29:11
  - Board's DI: "Bugeja's 'primary channel' is not the recited 'mandatory channel' because there is no showing that **there is no transmission on the secondary channels when the primary channel…is not idle**." DI at 38.

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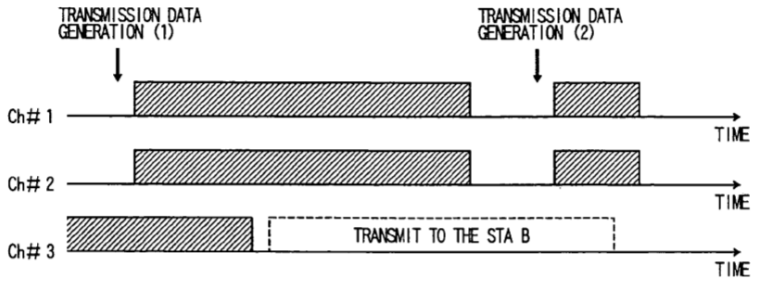
- The ’551 ***changes the decision to transmit*** for multichannel systems (POR at 7-8, Surreply at 11, 15)
  - Transmitting to an STA A with a mandatory channel: transmission is ***limited*** based on status of “mandatory channel” “even if another wireless channel is idle”
  - Transmitting to an STA B without a mandatory channel: ***not limited*** in this way, based only on channel’s ***own*** idle state

FIG. **4** is a flowchart of a wireless packet communication method according to the second embodiment of the present invention. FIG. **5** is a time chart of that wireless packet communication method. In this embodiment, there are an STA A for which a mandatory channel is set and an STA B for which no mandatory channel is set. There is no specific limitation to transmission to the STA B, while transmission to the STA A is allowed only when the mandatory channel is idle, and is not performed when the mandatory channel is busy even if another wireless channel is idle. Please note that in the first embodiment a mandatory channel is set for every STA so that packet transmission is always performed via wireless channels including the mandatory channel without an address of a wireless packet being considered.

FIG. 5



II. U.S. Patent No. 7,280,551

- Exemplary claims:

1. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

setting a mandatory channel that is always used for transmission; and

transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.

2. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

distinguishing an STA A from an STA B, the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission; and

when wireless packets are addressed to said STA A, transmitting the wireless packets to said STA A by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle; and

when wireless packets are addressed to said STA B, transmitting the wireless packets to said STA B by using idle wireless channel(s).

III. Ground 2 – Shpak-Lundby

III. Ground 2 – Shpak-Lundby

- Challenged claims: 1, 3, 5, 7
  - Claim 3 – depends from 1 or 2, same packet length
  - Claims 5, 7 are apparatus analogs of 1, 3
- Mediatek fails to meet its burden for Ground 2:
  1. Shpak does not disclose a "mandatory channel," and does not address the decision to transmit in multichannel systems
  2. Lundby, as Dr. Williams ***repeatedly admits***, does not address the decision to transmit in multichannel systems
  3. Thus, Shpak-Lundby cannot change the decision to transmit in multichannel systems, by disclosing the claimed "mandatory channel" or the step of "transmitting…only when the mandatory channel is idle"

III. Ground 2 – Shpak-Lundby

- Mediatek's Proposed Combination:
  - Shpak's "common frequency channel" used as a "primary channel," and adds another available 802.11b channel as a "secondary channel" "such that wireless packets are transmitted on both channels simultaneously" (Pet. at 41-42)
  - Per Dr. Williams:
    - "Shpak-Lundby access point would have **applied Lundby's decision tree** to select which channel(s) to use" (Williams Decl. at ¶140)
    - The decision to transmit is governed by Shpak (POR at 29-30): *E.g.*, Williams2 at 47:12-23 ("So modifying Lundby figure 2 to include a decision to transmit or not **would include a block before block 242 in figure 2 of Lundby, which would decide whether to transmit or not. And the teachings of Shpak with regards to 802.11 systems would teach the determination** of the…state of busy or idle is a process to determine whether—the channel is busy…")

Shpak – decision to transmit based on idle state

Lundby – decide to use 1 or 2 channels

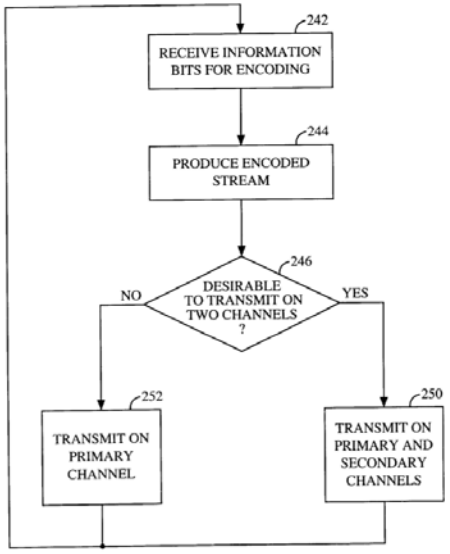


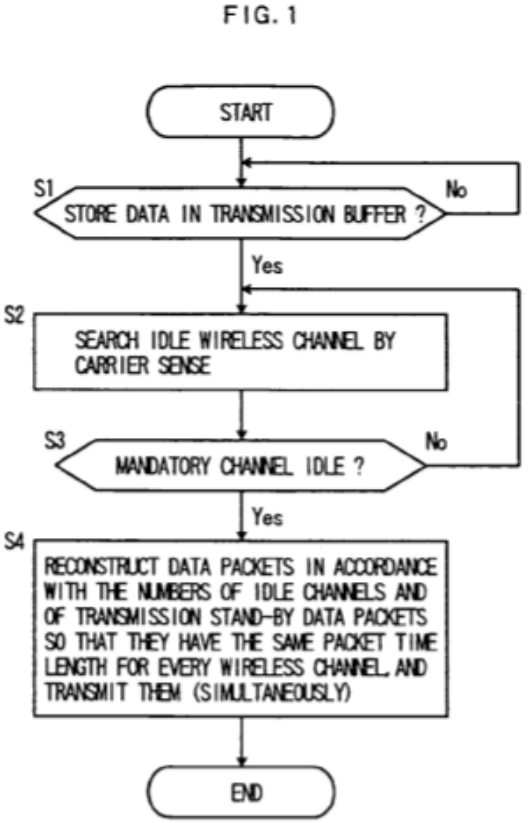
FIG. 2

III. Ground 2 – Shpak-Lundby

- **Shpak,** as the Board correctly found, only teaches a conventional single-channel system. (POR at 20-21; DI at 24).
  - See also POR at 30, Williams2 at 53:1-3 ("Through the 802.11 standard, as I discussed before, **Shpak, by itself, doesn't disclose the mandatory channel**.").
- Shpak ***does not*** preclude checking of another channel in a multichannel system for deciding to transmit. (POR at 30-31; 33-34)
  - Williams2 at 56:16-18 ("Q: Would the idle state of the secondary channel still be checked? A: I believe **Shpak is silent on that**.")
  - Williams2 at 75:16-20 ("In paragraph 5, the author's pointing to 802.11 process of CCA to determine whether to transmit or not and **doesn't restrict that determination to the common [frequency] channel**.")
- Shpak ***does not*** address any scenario where the "common frequency channel" is busy but another available channel is idle, doesn't address impact of another channel in the system at all. (POR at 31)

III. Ground 2 – Shpak-Lundby

- Because Shpak is a single-channel system, it need only do one thing—check if this one channel is idle. There is no separate consideration of whether this channel is "mandatory" (POR at 30)
- Contrast with '551, which teaches that two distinct considerations enter into decision to transmit: e.g., S2 ***and*** S3 in Fig. 1 (at right). (POR at 30)



III. Ground 2 – Shpak-Lundby

- Shpak's ***sole*** teaching re how the decision to transmit is made: sense idle before transmission is permitted
  - This is just the general idea of CSMA—using carrier sensing to determine channel state before transmitting
  - There is ***nothing*** in Shpak addressing multichannel systems (POR at 20-21)
  - There is nothing in legacy 802.11 that addresses multichannel systems
    - A "multichannel system" is one in which multiple channels are provided between a pair of STAs. (*E.g.*, POR at 12-13).
    - NOT the same as a single channel system, constructed by "determining in advance" a single channel. (See POR at 12-13, Surreply at 18).

III. Ground 2 – Shpak-Lundby

- **Lundby** addresses using one or two "channels" to transmit packets in CDMA systems (e.g., cell phones). Lundby's channels are ***code channels***, transmissions on the same frequency range distinguished by Walsh codes. (POR at 22-23).
- Lundby's methods only provide two options—transmit using one channel, or transmit using two channels (POR at 26)
- It is ***presumed*** that a transmission ***will occur*** (POR at 25-28)

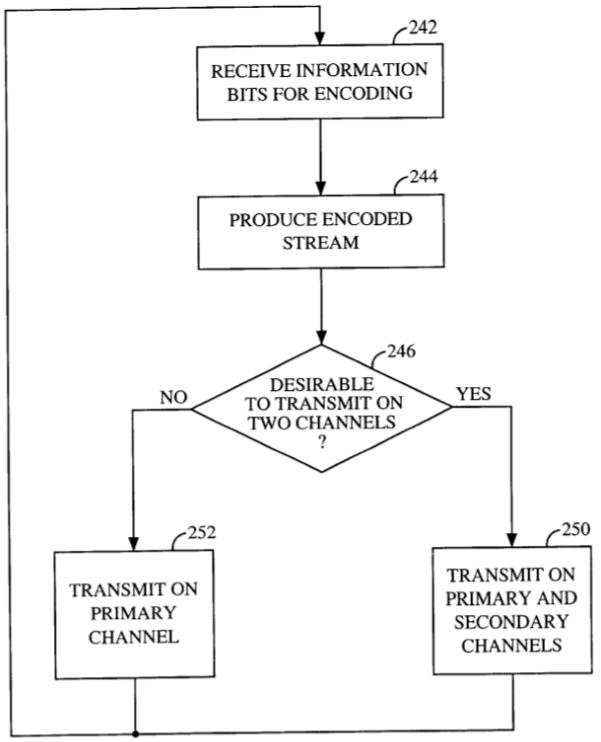


FIG. 2

III. Ground 2 – Shpak-Lundby

- Lundby ***does not*** teach how the decision is to be made. Mediatek's expert ***repeatedly*** agreed with this (POR at 26-27, 29-31). E.g.:
  - Williams2 at 47:12-15 ("And the use of the decision tree from Lundby, figure 2, **does not include the decision to transmit or not**. The **decision's already been made—been made to transmit** in Lundby figure 2."); *also id.* at 47:12-23 (Shpak supplies "determination" of idle state for decision to transmit for modified figure 2)
  - *Id.* at 61:22-62:4 ("The disclosures in Lundby, again, **don't check whether the primary channel is idle or busy**…The decision at [block] 246, figure 2, is whether there will be a transmission on the primary channel or on the primary channel and the secondary channels. And so **there's already been a decision to transmit** before entering figure 2, as we've discussed before.")

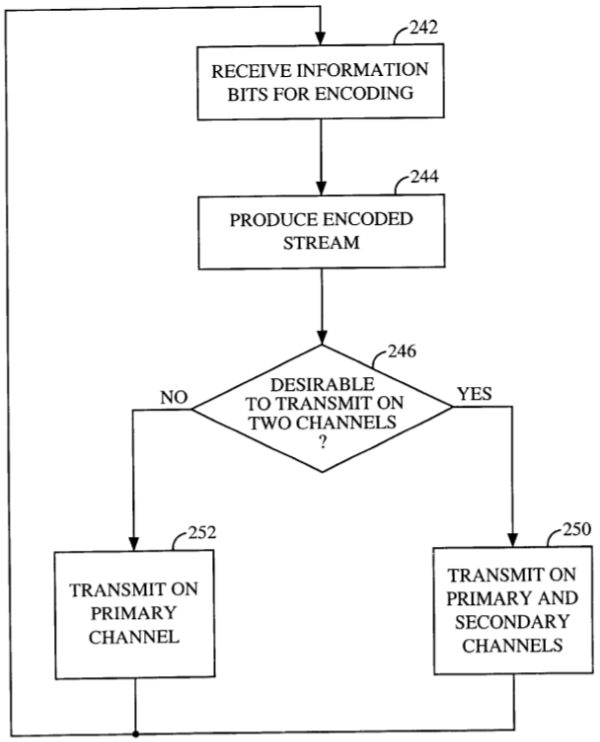


FIG. 2

III. Ground 2 – Shpak-Lundby

- What, *if any*, implications are there in Lundby re the decision to transmit? → Decision to transmit is made based on a channel's ***own*** availability

1. Re "primary channel," Lundby ***does not*** teach that "primary" status is permanent, or depends on the status of any other code.
   - *E.g.*, Geier Decl. at ¶101
   - Williams2 at 18:4-13 (Q: "…If at the beginning of a transmission, one of these codes must be assigned to Lundby's primary channel, does Lundby teach or suggest any reason for – **to prefer one of these example codes over another**?" A: "**Not that I recall**…")

- Thus, Lundby does not alter how conventional CDMA systems decide to transmit—*i.e.*, keep trying codes until an available one is found. (POR at 28; Geier Decl. at ¶101)
  - Use of one available code channel does not depend on status of any other

III. Ground 2 – Shpak-Lundby

- What, *if any*, implications are there in Lundby re the decision to transmit? → Decision to transmit is made based on a channel's ***own*** availability

2. Re "secondary channel," code selection is *dynamic*, based on availability:
   - At block 246, "This **check** is done because…**a code needs to be available** to allocate to the secondary channel." Lundby at 4:64-67.
   - Use of any given code for a "secondary channel" ***does not*** depend on the state of any other particular code. (Surreply at 2, 4).
   - Per Dr. Williams, at block 246, "[t]he disclosures in Lundby, again, **don't check whether the primary channel is idle or busy**…." *Id.* at 61:22-24.

- Thus, Lundby's methods do not provide any means for ***preventing transmission*** so long as any code channel is "idle" (available)
   - ***Any*** code can be chosen to be the "primary" channel, ***any*** code can be chosen to be the "secondary" channel (POR at 28, 34; Surreply at 2-3)

III. Ground 2 – Shpak-Lundby

- Putting Shpak-Lundby together, based on Mediatek's descriptions:
  - Decision to transmit is addressed by Shpak → sense that a channel is idle before transmitting
  - ***Once the decision to transmit is already made***, Lundby teaches using an additional channel if also idle
  - **Result**: If there is one idle channel, transmit on that channel. If there are two idle channels, can transmit on both. → ***No reason to restrict transmission decision based on status of only one of these two channels***. Either channel in Shpak-Lundby could be assigned "primary" status for Lundby's decision tree. (POR at 32-37, 41-44; Surreply at 2-3)
- What's missing: ***Any*** teaching or suggestion that ***the decision to transmit*** depends on the special status of one channel.
  - Shpak only says idle state is important, ***not*** the idle state of any ***particular*** one channel in a multichannel system. (POR at 33-34; 42)
  - Lundby, as Dr. Williams repeatedly admitted, does not fill this gap, because Lundby presumes there will be a transmission. (POR at 34-36; 43)

III. Ground 2 – Shpak-Lundby

- Mediatek fails to allege any teaching of preventing transmission (POR at 38-41; Surreply at 4-5)
  - Advantages of using two channels over using one for throughput ("bandwidth augmentation") → emphasizes throughput, suggests transmission should occur when possible
  - Adding second channel is one of finite number of solutions? Irrelevant, only options addressed are transmitting using one channel vs two → Not a reason to prevent transmission altogether
  - Is "reserving" a secondary channel code more efficient for "bandwidth augmentation"? No: ***With*** reservation, has ability to transmit on 2 channels when available; ***without*** reservation, has ability to transmit on 2 channels when available
  - Nothing resembling the problem described in the '551 – impact of power leakage across different channels on multichannel throughput. Lundby only addresses co-channel interference (same channel), and deals with this using Walsh codes.

III. Ground 2 – Shpak-Lundby

- Comparing Shpak-Lundby with the claim language:

1. Lacks a "mandatory channel"
   - **Prelim. Constr.:** No disclosure suggesting that transmission must occur over "common frequency channel" "before" the other channel → Shpak suggests both would be checked; Lundby doesn't change this (POR at 44-45)
   - **NTT's modified constr.: "**Idle" state of "common frequency channel" does not dictate whether other channel can be used → Shpak suggests both would be checked; Lundby doesn't change this (POR at 41-44)

- No construction? (MT's proposal)
  - No disclosure requiring that "common frequency channel" is "always used," because no teaching addressing situation where "common" channel is busy but other channel is idle, so presumption is an idle channel will be used (POR at 45)

1. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

setting a mandatory channel that is always used for transmission; and

transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.

III. Ground 2 – Shpak-Lundby

- Comparing Shpak-Lundby with the claim language:

2. Lacks limiting transmission "only when the mandatory channel is idle"
   - Shpak does not teach anything re limiting transmission based on the status of one of two channels (POR at 46; Surreply at 5-6)
   - Lundby does not limit transmission based on the idle status of any one channel, or teach any method of preventing transmission at all→ transmission is ***presumed*** (POR at 45-46).
     - Per Dr. Williams, the idle state of the "primary" channel is not checked ***at all*** (POR at 43): Williams2 at 61:22-24 ("The disclosures in Lundby, again, **don't check whether the primary channel is idle or busy**.").

1. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

setting a mandatory channel that is always used for transmission; and

transmitting the wireless packets by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle.

III. Ground 2 – Shpak-Lundby

- Mediatek argues that NTT did not address its proposed combination. Not so – Dr. Williams admitted the decision to transmit is not addressed by Lundby, and that this is a block that has to be added based on Shpak.
- However, Shpak-Lundby cannot change the decision to transmit in multichannel systems, when neither Shpak nor Lundby individually do so. → ***Not*** a different combination, but ***a gap*** in Mediatek's Shpak-Lundby. (Surreply at 5-6)
  - The '551 changes the way the decision to transmit is made in multichannel systems – i.e., not just whether there are idle channels, but also status of a "mandatory channel"
  - Shpak does not address the decision to transmit in multichannel systems
  - Lundby does not address the decision to transmit ***at all***
- **Begs the questions:** (1) Where can the altered decision to transmit come from in Shpak-Lundby, if not Shpak or Lundby? (2) What motivation to add this?

III. Ground 2 – Shpak-Lundby

- Mediatek argues that Lundby "reserves" the "secondary channel" for augmentation only.
  - ***BUT*** there is ***no support*** for channel reservation in Lundby.
  - Lundby ***teaches against*** channel reservation – e.g., no single code is permanently reserved for "secondary" use, because code availability must be checked each time (Surreply at 1-5)
- Does Shpak disclose enough for the decision to transmit?
  - No, Shpak doesn't address multichannel systems at all. (Surreply at 7-8).
  - Theoretical existence of 14 channels in the 2.5 GHz band is irrelevant—until a channel has been "determined in advance" through negotiation of two STAs, ***it's not part of any system***. (Surreply at 7).
  - Dr. Williams admitted Shpak's teachings would not preclude checking another channel in a multichannel system.

IV. Claim Construction

IV. Claim Construction– Mandatory channel

- **Preliminary Construction:** One channel in a wireless multichannel communication system over which transmission must occur before transmission over the other wireless channels
  - **NTT's Proposal:** modify underlined language to "whose idle state determines whether there can be a transmission"
  - **Mediatek's Proposal:** "plain meaning" (or "that is always used")
- **One area of agreement:** The language of the preliminary construction suggests a difference in *timing*, but the specification supports simultaneous use. (POR at 16-19).
- **The Dispute:** Whether the "mandatory channel" is one channel in a ***multichannel*** system
  - **NTT's position:** The Board is correct. The intrinsic record supports "multichannel" reading. Mediatek is ignoring the claim language and specification.

IV. Claim Construction– Mandatory channel

- Intrinsic record supports the Board's "multichannel" construction
- Claim language (POR at 12-13, Surreply at 15):
  - "Mandatory" qualifier – indicates this channel is ***not the same*** in comparison to other channels that are not "mandatory". See also DI at 20 ("There is nothing 'mandatory' about a channel if it is the only channel provided")
  - "Always used" for transmission, indicates that ***but for this language***, might not always be used
  - Transmitting "only when" mandatory channel is idle → ***but for this language***, transmission might not be limited in this way
  - Transmitting on channel(s) that "include/includes" the mandatory channel
  - Compare language of claims 2, 6:
    - Transmission to STA A with a mandatory channel: "only when the mandatory channel is idle"
    - Transmission to STA B without a mandatory channel: "using idle wireless channel(s)"
    - → ***This distinction disappears for single-channel systems***

IV. Claim Construction– Mandatory channel

- Specification (POR at 14-15, Surreply at 19-21):
  - ***Every*** embodiment is a multichannel system.
    - *E.g.*, First, Second embodiments are multichannel systems. Other embodiments add additional features to these embodiments, but are otherwise explicitly stated to be the same.
  - Description of the problem indicates multichannel (see slides 7-8 supra)
  - Description of the solution indicates that decision to transmit is changed for multichannel systems, e.g.:
    - "When the mandatory channel is busy, each STA does not perform transmission ***even if there is another idle wireless channel***." *Id.* at 5:55-57.
    - The "mandatory channel" may be regarded as "a wireless channel having the highest priority ***among wireless channels.***" *Id.* at 3:57-60.

IV. Claim Construction– Mandatory channel

- Prosecution history (POR at 15-16)
  - Every cited reference relates to a multichannel system
  - Describing the mandatory channel as “indispensable” is similar to qualifying it as “mandatory” → ***but for*** this qualifier, it’s possible to be “dispensable”

IV. Claim Construction– Mandatory channel

- Mediatek points to ***no support*** for its "single channel" system reading:
  - No evidence that "mandatory channel" is a known term of art—it was coined for the '551. Qualifier "mandatory" does not inform what a "mandatory channel" is, unlike "*boot selection* flag" in *Altiris*. (Surreply at 16-17).
  - Citations to specification only suggests that a single channel—the "mandatory channel" could be ***used*** at a given moment, **NOT** that only a single channel was ever ***provided*** (i.e., a single-channel system). (E.g., Surreply at 17, 19-20).
  - Mediatek tries to alter Fig. 15 to show that "power leakage" is not limited to multichannel systems. **But**, Fig. 15 is described as showing the problem where "**throughput** cannot be improved even if simultaneous transmission is performed **using multiple wireless channels at the same time**" – i.e., a multichannel problem. (Surreply at 20-21).

IV. Claim Construction– Mandatory channel

- Mediatek argues that channel negotiation in conventional single-channel systems can be "setting a mandatory channel," but the ***specification contradicts this***. (Surreply at 18-19).
- "Conventional" systems "determine in advance" a single wireless channel to be used. → It was known that this is 1 of 14 channels, but the '551 ***does not*** call this "setting a mandatory channel." (POR at 12-13, Surreply at 18).
  - The 14 channels could be identified ***in theory***, but until "determined in advance," ***none*** of these actually exist in ***any*** system.
- Mediatek admits its interpretation would render "setting a mandatory channel" language "unnecessarily redundant" with "determin[ing]" a channel "in advance." (Surreply at 18)..

In a conventional wireless packet communication apparatus, a wireless channel to be used is determined in advance. Prior to transmission of a data packet, the wireless packet communication apparatus performs carrier sense to detect whether or not that wireless channel is idle. Only when that wireless channel is idle, the wireless packet communication apparatus transmits one data packet. This management allows a plurality of stations (hereinafter, STA) to share one wireless channel in a staggered manner ((1) International Standard ISO/IEC 8802-11 ANSI/IEEE Std. 802.11, 1999 edition, Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific reguirements—part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: (2) "Low-powered Data Communication System/Broadband Mobile Access Communication System (CSMA) Standard", ARIB STD-T71 version 1.0, Association of Radio Industries and Businesses, settled in 2000).

IV. Claim Construction– Mandatory channel

- District Court's construction in parallel litigation ***does not*** conflict with Board's (Surreply at 13-15). The Board correctly determined that this language is similar to the preliminary construction (DI at 21).
  - "Mandatory channel" may be the only channel and **wherein its busy/idle state determines whether there is transmission regardless of idle state of other channels** (if any)
  - Includes ability to control transmission more so than other channels → invites comparison with other channels
  - Dist. Ct. did not provide ***any reasoning*** explaining the effect of its construction → Mediatek is asking the Board to read tea leaves
    - Dist. Ct. will not address the same issues as the Board – MT stated it will not cite the single-channel references Shpak, Bugeja (Pet. at 77)
  - Surrounding claim language, other than the term "mandatory channel" itself, also indicates multichannel system (see slide 32). Thus, the "mandatory channel" could itself be "the only channel" used at any moment, but surrounding language indicates others are present.

IV. Claim Construction– Mandatory channel

- Mediatek fails to demonstrate relevance of EP prosecution:
  - Fails to point out that the cited history relates to EPC Art. 84, which relates to ***clarity*** standards, ***not*** arguments about claim scope over prior art. (Surreply at 22).
  - Fails to demonstrate that the specific clarity standards of Art. 84 are not unique to EP law. (Surreply at 21-22).
    - "[T]he varying legal and procedural requirements for obtaining patent protection in foreign countries might render consideration of certain types of representations inappropriate" – *Caterpillar v. Berco* (FedCir 1983). *Caterpillar* aff'd decision ***not*** to rely on foreign prosecution statements.
    - Statements in foreign prosecution are only relevant if "not related to unique aspects of foreign patent law." *Apple v. Motorola* (FedCir 2014); *also Pfizer v. Ranbaxy*.
- EP statements demonstrate applicant believes the claims to relate to multichannel systems—only disagreement with EPO related to clarity of phrasing under Art. 84 (Surreply at 23-24)

V. Ground 1

V. Ground 1 – Shpak-Ho

- Challenged claims: 1, 3, 5, 7
- Mediatek fails to meet its burden for Ground 1:
  - Ground 1 depends on construing "mandatory channel" to include a single-channel system. This is incorrect.
  - The Board correctly determined that a "mandatory channel" is "one channel in a **multichannel** communication system"
  - The Board correctly determined that Shpak does not disclose a "mandatory channel" (DI at 35)

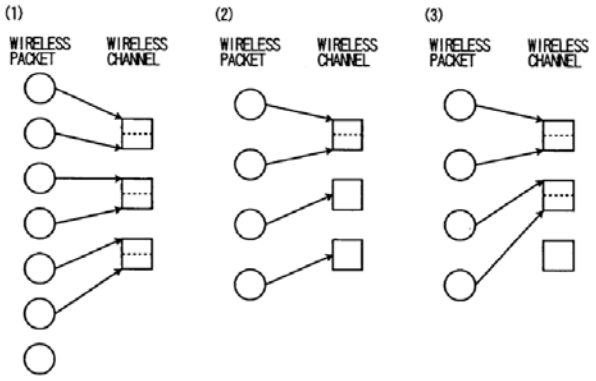
V. Ground 1 – Shpak-Ho

- **Shpak** is addressed with respect to Shpak-Lundby. Shpak does not disclose a multichannel system, only a single-channel system
- **Ho** does not alter this. Ho provides general teachings relating to MIMO, but makes clear that MIMO is a ***single-channel*** technology (Surreply at 17)
  - Mediatek agrees that MIMO, standing alone, is a single-channel technology that creates multiple ***spatial streams*** within ***the same frequency range***. (Reply at 21).
  - But, parties have agreed that "wireless channels" in the context of the '551 patent refers to ***distinct frequency ranges*** (DI at 22)
- **Result**: Shpak-Ho does not disclose a multichannel system, so there can be no "mandatory channel"

V. Ground 1 – Shpak-Ho

- Mediatek's counterarguments fail:
  - The "multichannel" aspect of the Board's construction is correct. The claims ***do not*** include single-channel systems.
  - That MIMO, standing alone, is a single-channel technology does not change this. The specification teaches that MIMO could also be implemented in a multichannel system (e.g., Fig. 14), and at any given moment a single channel could be ***used***. → ***Not*** the same thing as saying a single channel was ***provided*** at the outset. (Surreply at 17)

FIG. 14



V. Ground 1 – Shpak-Ho

- Mediatek's counterarguments fail:
  - Compare claim 4:
  - Dependent claim 4 – includes features of claim 1, further adds "selectively" using multiple channels or MIMO (single channel)
  - There can be no "selection" without both options being available (Surreply at 19)
  - Similar argument for apparatus claims of 5, 8

4. The wireless packet communication method according to claim **1** or **2**, further comprising

simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.

V. Ground 1 – Shpak-Ho

- Compare claim 2 → language draws a distinction between transmission to an STA with a "mandatory channel" from an STA without:
  - "only when the mandatory channel is idle" for STA A
  - "using idle wireless channel(s)" for STA B
- This distinction vanishes if single-channel systems could satisfy claim 1 (Surreply at 11, 15)

2. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

distinguishing an STA A from an STA B, the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission; and

when wireless packets are addressed to said STA A, transmitting the wireless packets to said STA A by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle; and

when wireless packets are addressed to said STA B, transmitting the wireless packets to said STA B by using idle wireless channel(s).

V. Ground 1 – Shpak-Ho

- Mediatek's counterarguments fail:
  - Shpak does not describe "setting a mandatory channel" under the Board's, or any other construction. The specification teaches that "determining in advance" a single channel for a single-channel system is ***not*** the same thing as "setting a mandatory channel" – deliberately uses different language. (Surreply at 18).
  - Embodiments contradict the idea that "setting a mandatory channel" can result in a single-channel system. (Surreply at 18). After a mandatory channel is set, it can still be used ***simultaneously with other channels***.
    - Mediatek's expert agrees with this (POR at 17): *E.g.*, Williams1 at 29:24-30:7 ("[I]f you look back at the ['551] patent on figure 2, you see that [the Board's] construction is at odds with figure 2 of the patent where there are two channels that are **transmitting simultaneously** after the mandatory channel has been tested to be idle and found to be idle. **So there's no…temporal difference between transmissions on channel 1 [the mandatory channel of Fig. 1] and channel 2.**").

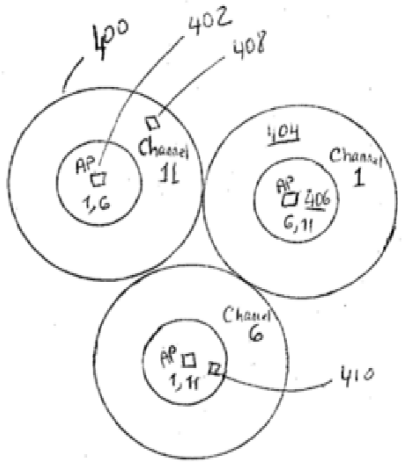
VI. Ground 3

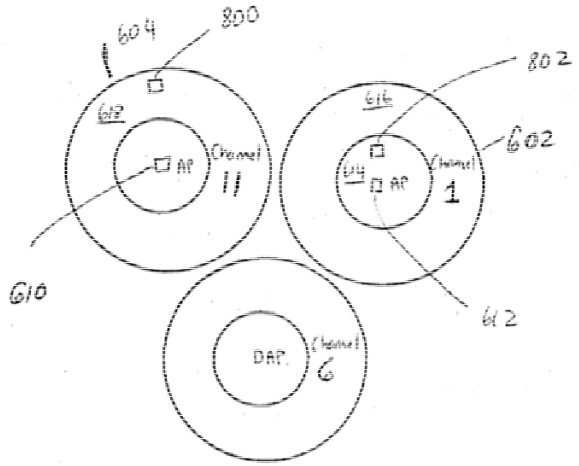
VI. Ground 3 – Bugeja-Ho

- Challenged claims: 1-3, 5-7 (***only*** ground challenging claims 2, 6)
- Mediatek fails to meet its burden for Ground 3:
  - Ground 3 also relies on "single channel system" reading of the claims (Pet. at 58-59) → So, Ground 3 fails for at least the same reasons as Ground 1 (POR at 54)
  - There are additional reasons why Ground 3 fails:
    - Bugeja teaches against treating one channel differently from others ***with respect to the decision to transmit*** (POR at 55-56). Instead, Bugeja teaches that channel use is governed only by its own idle state—not the idle state of another channel.
    - The Board correctly concluded that Bugeja does not disclose the "mandatory channel" because its "primary channel" does not "control system transmissions" (DI at 38-39)
    - Bugeja does not distinguish between STAs with a mandatory channel from those without, ***with respect to how transmissions occur***

VI. Ground 3 – Bugeja-Ho

- Bugeja's "primary" and "secondary" channels differ in only one respect – "primary" is preferred for assignment in outer region, "secondary" typically only assigned in inner region
- Otherwise, ***once assigned***, channel use is the same—transmit when idle
- Bugeja discusses **both** single-channel clients (e.g., Fig. 4, left) and multichannel clients (e.g., Fig. 7, right)



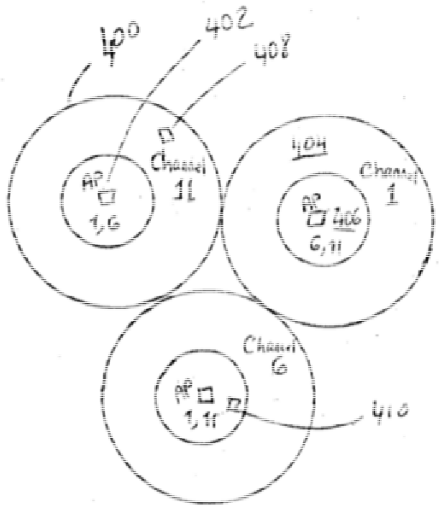


VI. Ground 3 – Bugeja-Ho

- What is the "system"? → Bugeja describes two different kinds: (1) single channel, and (2) multichannel
- What is the "multichannel AP"? → By itself, ***not*** a complete system.
  - When communicating with a single-channel client, this is a single-channel system. (Pet. at 55) ("Although Bugeja's Figure 4 embodiment utilizes a multichannel [AP] that can transmit simultaneously on three channels, POSAs would have understood each to be a SISO channel.").
  - When communicating with a multichannel client, this is a multichannel system. (Surreply at 9; 11-12)
  - These two types of systems should be considered separately
  - Regardless of which type of client/system is considered, Bugeja lacks a "mandatory channel"

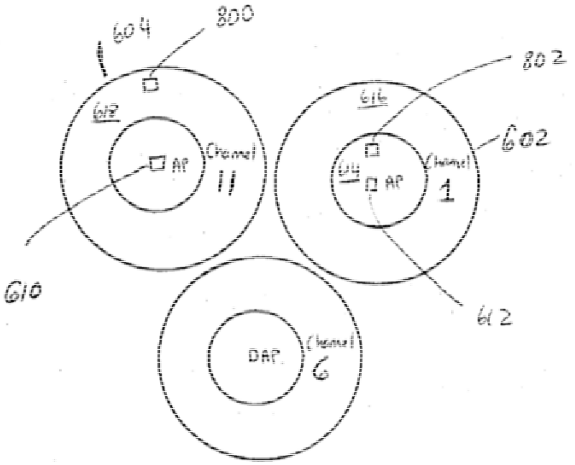
VI. Ground 3 – Bugeja-Ho

- Single-channel systems (e.g., Fig. 4):
  - Outer region client assigned a "primary channel"
  - Inner region client assigned a "secondary channel"
- How is decision to transmit made? (POR at 55-57; Surreply at 10)
  - For outer region client, transmit when "primary" is idle
  - For inner region client, transmit when "secondary" is idle
  - → ***No teaching that transmission on "secondary" depends on status of "primary"***
- Two absurd outcomes under Mediatek's reading (POR at 56-57; Surreply at 12-13):
  - Both the "primary" and "secondary" are "mandatory channels" because they are "always used" for that client
  - Neither "primary" or "secondary" are "mandatory" because neither can control transmission on the other



VI. Ground 3 – Bugeja-Ho

- Multichannel systems (e.g., Fig. 7):
  - A client in inner region can be assigned ***all three channels*** ("primary" + two "secondary" channels) (POR at 57-58; Surreply at 9-10)
  - Bugeja teaches that "[a] client 410 located within the inner region 406 can communicate **on all three channels**" (id. at ¶33)
  - So, for multichannel client 800, "t**he three channels can be used simultaneously** to upload or download when the client is located in the inner region 614 of the cell" (id. at ¶46).
- How is a decision to transmit made?
  - Transmit on one, or all three, channels depending on idle state
  - ***NO teaching*** that idle secondary channels are left unused if the primary channel is busy
- Thus, no "mandatory channel" under NTT or Board's constructions, no "mandatory channel" that is "always used" per Mediatek's arguments



VI. Ground 3 – Bugeja-Ho

- Claims 2 and 6 require ***distinguishing*** between an STA A with a "mandatory channel" set, and an STA B without
- ***But there's more*** → claim also requires ***transmitting in a different manner*** depending on the STA (Surreply at 10-11):
  - "only when the mandatory channel is idle" for STA A
  - "using idle wireless channel(s)" for STA B
- The claims require ***more*** than merely being able to identify different STAs (Surreply at 13)
- Bugeja teaches only one way of deciding to transmit—idle state of channel being used, not idle state of any other channel

2. A wireless packet communication method for transmitting a plurality of wireless packets simultaneously by using multiple wireless channels determined to be idle by carrier sense, a single wireless channel determined to be idle and MIMO, or the multiple wireless channels and the MIMO, the method comprising:

distinguishing an STA A from an STA B, the STA A for which a mandatory channel is set, the STA B for which no mandatory channel is set, the mandatory channel being always used for transmission; and

when wireless packets are addressed to said STA A, transmitting the wireless packets to said STA A by using a wireless channel/wireless channels that includes/include the mandatory channel, only when the mandatory channel is idle; and

when wireless packets are addressed to said STA B, transmitting the wireless packets to said STA B by using idle wireless channel(s).

VII. Ground 4

VII. Ground 4 – Shpak-Ho or Bugeja-Ho with Thielecke

- Challenged claims: 4, 8
- Mediatek fails to meet its burden for Ground 4:
  - Ground 4 relies on Shpak-Ho or Bugeja-Ho for features of claims 1, 2. So, Ground 4 fails for at least the same reasons as Grounds 1 and 3, including lack of a "mandatory chanel."
  - There are additional reasons why Ground 4 fails:
    - Claims 4 and 8 further require "selectively" using "multiple wireless channels" or "MIMO"
    - But, per Mediatek's Petition, Shpak-Ho and Bugeja-Ho are both single-channel systems
    - Thielecke does not convert these into multichannel systems, because Thielecke only discusses changing the number of MIMO streams

VII. Ground 4 – Shpak-Ho or Bugeja-Ho with Thielecke

- Claims 4 and 8, like claims 1 and 5, relate to multichannel systems
- "Selectively" using "multiple wireless channels" or "MIMO" means ***both*** are available options
- But: Thielecke only discloses changing the number of MIMO streams (POR at 63-64; Surreply at 24-25)
  - → Mediatek admits that MIMO is a single-channel technology (Pet. at 24, 55-56; Reply at 21)
  - Thielecke cannot turn Shpak-Ho or Bugeja-Ho into multichannel systems, and does not disclose how to select between using "multiple wireless channels" or "MIMO"

4. The wireless packet communication method according to claim **1** or **2**, further comprising

simultaneously transmitting wireless packets selectively using the multiple wireless channels or the MIMO in accordance with a number of pieces of data or a number of MIMOs that depends on a channel condition.

END