

B. Claim 1

1. 1[pre]: “A wireless device, comprising”

~~To~~64. It is my opinion that, to the extent the preamble is limiting, Wen
~~discloses a wireless device.~~

~~EX1003, ¶64. For example, Wen discloses “a mobile wireless communications~~
discloses the preamble. In particular, Wen teaches “a mobile wireless
communications device.” EX1004, [0027].~~See also id.~~, [0030], [0041], [0043]
~~(same).~~

2. 1[a]: “one or more antennas”

65. It is my opinion that Wen discloses ~~one or more antennas. EX1003,~~
~~¶65. For example~~ this limitation. In particular, Wen

~~discloses~~ describes “a mobile wireless communications device ... which may include a

housing and *a common antenna.*” EX1004, [0027]. “The antenna 33 is ‘common’”

because “it is shared by a plurality of wireless radio frequency (RF) transceivers 35a-

35n.” *Id.*, [0031]; ~~see also id., Fig. 1 (annotated, showing antenna as element 33 in,~~

~~yellow):~~

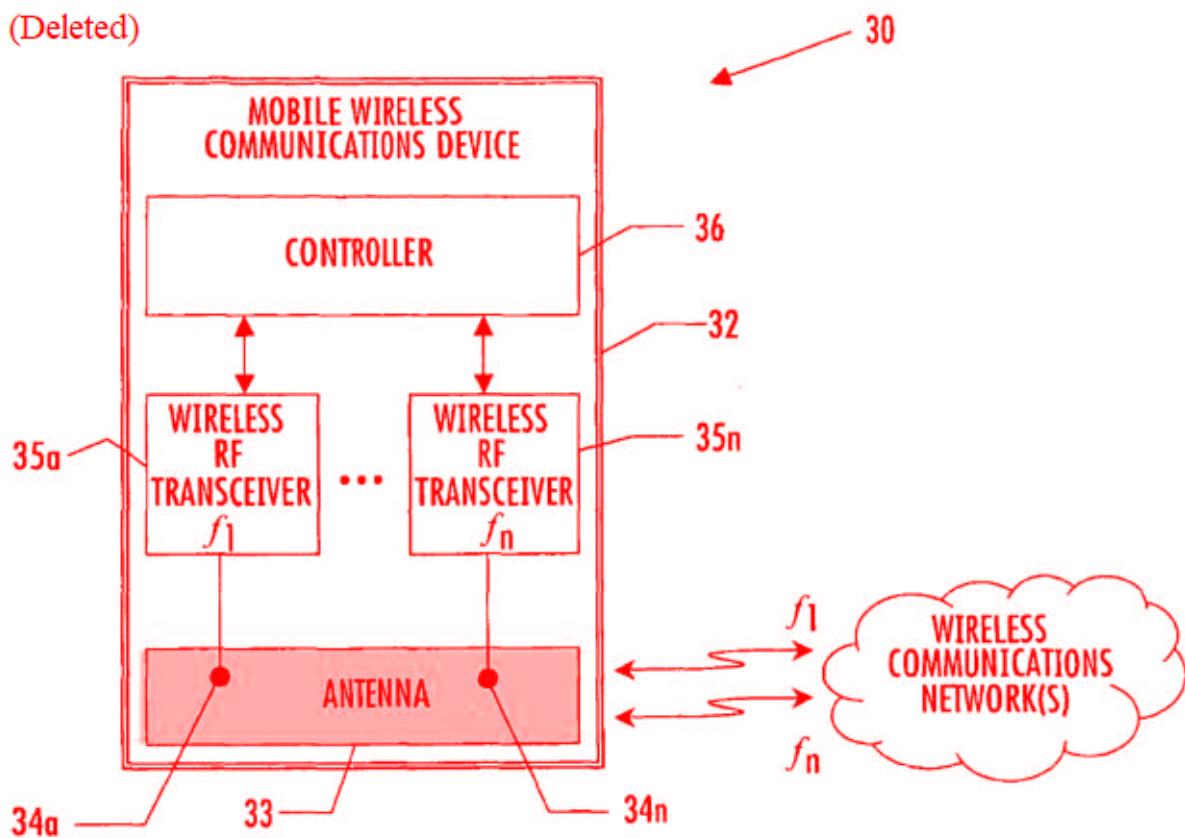
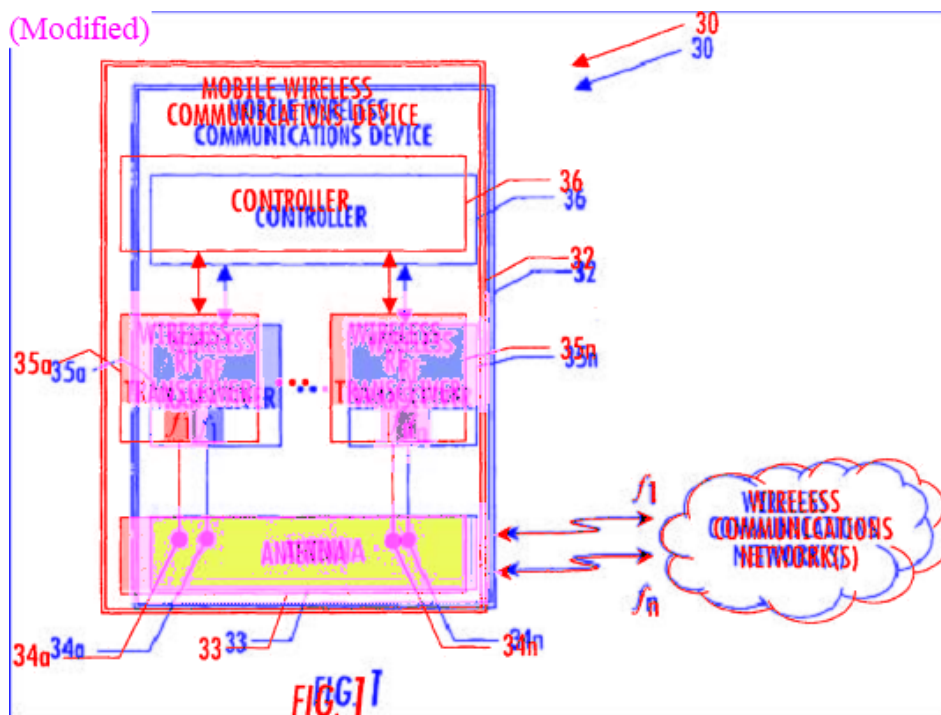


FIG. 1

3. 1[b]: “a plurality of transmitters, receivers or transceivers that operate in one or more frequency bands”

66. It is my opinion that Wen discloses this limitation. In particular, Wen
~~Wen discloses “teaches that the mobile device may “include a plurality of wireless~~
~~radio frequency (RF) transceivers~~
~~carried by the housing and coupled to respective ones of the signal feed points of the~~
~~common antenna.” EX1004, [0027]. “Each wireless RF transceiver preferably has~~
~~(RF) transceivers” where each has “a respective different operating frequency~~
~~associated therewith.” Id., [0031]; see~~
~~associated therewith.” EX1004, [0027], [0029] (“Also by way of example, the~~
~~different operating frequencies may be within a range of about 900 MHz to 6 GHz.~~
~~Further, the different operating frequencies have different user functions associated~~
~~also id., [0039] (example with antenna “tuned to provide operation at 900 MHz,~~
~~1800 MHz, and 5 GHz via a selective connection of appropriate wireless RF~~
~~transceivers”). Thus, each transceiver operates in at least one frequency band, and~~
~~the plurality of transceivers operate in multiple frequency bands (at least one per~~
~~transceiver) (i.e., operate in one or more frequency bands). EX1003, ¶66. Wen’s~~
~~transceivers are illustrated in Figure 1, annotated below, where the plurality of~~
~~therewith”), [0031]. The transceivers are elements (light purple below, 35a - 35n~~
~~(annotated in blue) and their corresponding) operate in more~~
~~frequencies of operation are f_1 - f_n (annotated in purple):~~

than one frequency band (dark purple below, $f_1 - f_n$), enabling the multiband antenna (yellow, below).



EX1004, Fig. 1.

4. 1[c]: “wherein at least one antenna of said one or more antennas is used by said plurality of transmitters, receivers or transceivers in a plurality of different bands”

67. As I described above for Ground I, Claim 1[b], Wen discloses a
~~As described above, Wen discloses a~~ **plurality of transceivers** that operate in
a plurality of different bands. See Limitation 1[b]; see also EX1004,
 [0029] (example with “different operating frequencies ... within a range of about
 900 MHz to 6 GHz”).

~~to 6 GHz~~”). EX1003, ¶67.

Further 68. Furthermore, Wen discloses *at least one antenna* (e.g.,
 antenna 33) that
is used by the plurality of transceivers in a plurality of different bands (e.g.,
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transceivers 35a-35n operating in bands f_1 to f_n). EX1004, [0031], Fig. 1. As shown in Figure 1 (~~reproduced and annotated~~ above), a single antenna is connected to and used by the plurality of ~~plurality of~~ transceivers. Wen expressly discloses that “[t]he antenna 33 ... is *shared by a* ~~by a~~ *plurality of wireless radio frequency (RF) transceivers 35a-35n* (e.g., cellular and/or wireless LAN transceivers)” and that “[e]ach wireless RF transceiver preferably has a respective *different operating frequency associated therewith.*” EX1004, [0031]; *see also id.*, [0039] (example where the antenna “provide[s] operation at 900 MHz, 1800 MHz, and 5 GHz via a selective connection of appropriate wireless RF transceivers 35”); [0036] (“[A] single multi-feed antenna [] may be used instead of a plurality of different antennas ... to provide multi-frequency band operation.”). Accordingly, in my opinion, the shared antenna is used in *a plurality of different bands, i.e.*, at least one band for each of the plurality of transceivers.

~~EX1003, ¶68.~~

5. 1[d]: “wherein said at least one antenna is one or more of a) an actively tuned antenna, and b) is tuned by one or more passive elements which are selected or interconnected using electronic control”

69. It is my opinion that Wen discloses or renders obvious this limitation.

Wen ~~discloses~~ at least ~~prong~~ teaches part (b) of ~~Limitation 1[d]~~ the limitation because ~~Wen's~~ it describes an antenna that is

tuned by one or more passive elements which are selected or interconnected using electronic control.

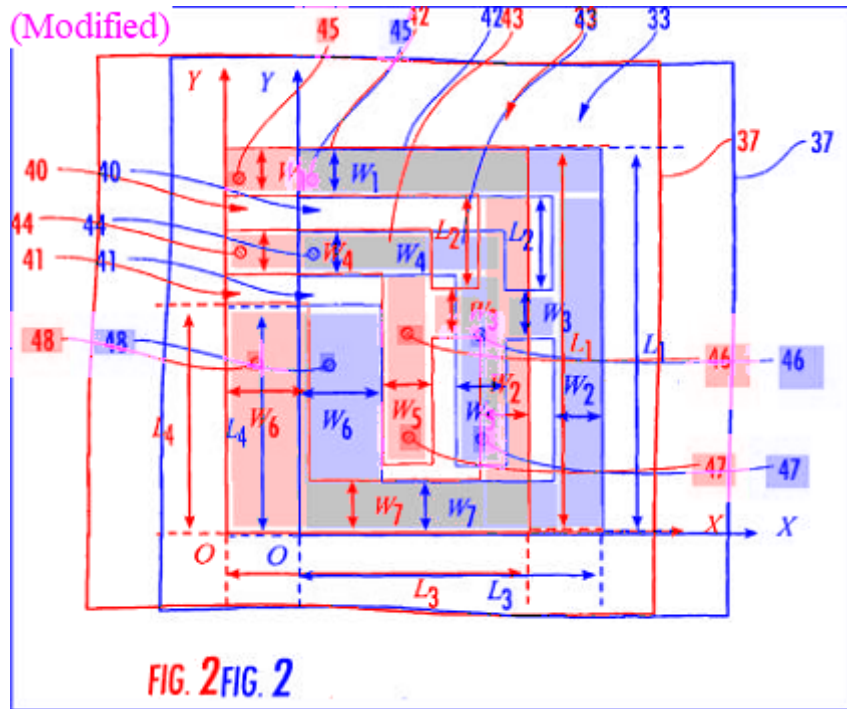
~~electronic control.~~³ EX1003, ¶69. Wen discloses *passive elements* in the form of

~~³ Because Limitation 1[d] is stated in the disjunctive (i.e., *one or more of*), it is satisfied by a reference that discloses either prong (a) or prong (b) of the~~

70. In particular, Wen discloses *passive elements* in the form of “leg
~~“leg~~ portions” that make up the antenna and “may advantageously *be selected to tune*
the desired operating frequencies of the antenna 33.” EX1004, [0035]. ~~Each~~ Wen
discloses that each leg portion “may be substantially related to a given operating
frequency band” or “may influence multiple operating frequency bands.” *Id.* Figure 2,
reproduced and annotated below, illustrates an embodiment with “a plurality of leg
portions” ~~(annotated in grey)~~ “defined by widths W_1 - W_7 and lengths L_2 and L_4 .” *Id.*,
[0035], Fig. 2. ~~A~~

71. In my opinion, a POSITA would have understood that the “leg portions”
of Wen’s antenna are passive elements because they have fixed electrical
characteristics—specifically, because they are implemented as “conductive trace[s]
on the dielectric substrate,” and do not include any additional circuitry that changes
their electrical characteristics during operation. See ~~EX1003, ¶¶70-71; see also~~
EX1004, [0032] (“[T]he common antenna 33 may include at least one conductive trace
on the dielectric substrate.”).

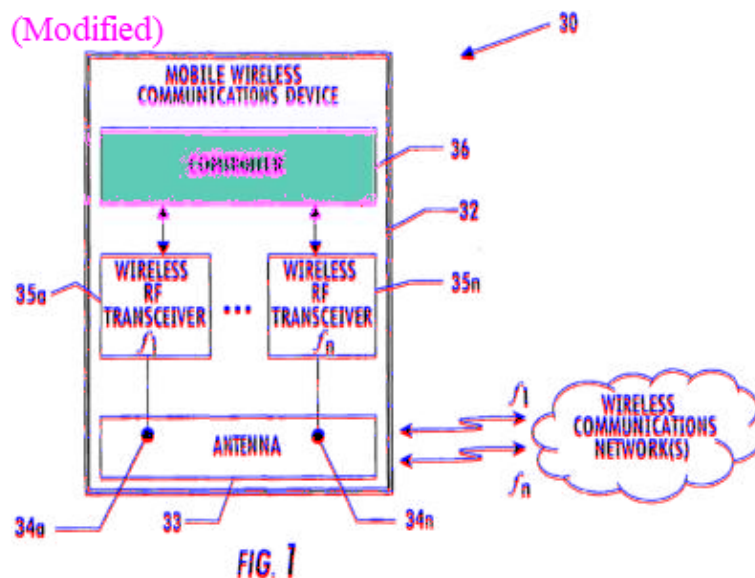
~~limitation. PO has adopted a consistent interpretation of the limitation in its infringement
contentions in the corresponding district court case. See EX1011, 14 (alleging
infringement based on “part (b) of this claim element”).~~



Id., Fig. 2.

72. Wen ~~further~~also discloses that the “leg portions” (*passive elements*) are used

to *tune the antenna* by *selecting them using electronic control*, namely by the operation of a controller (36, ~~annotated in green~~), illustrated in Figure 1 (annotated below).



EX1004, Fig. 1. Wen's controller "selectively operat[es] at least some of the wireless RF transceivers to ... use the common antenna at a same time." *Id.*, [0027]. The antenna is then "tuned to provide operation at" specific frequency bands "via a selective connection of appropriate wireless RF transceivers" to different "feed point[s]" on different leg portions of the antenna (annotated in red in Figure 2, above). EX1004, [0039]-[0040]; *see also id.*, [0034] (describing the structure of the feed points). For example, Wen discloses an embodiment where "the antenna 33 is tuned to provide operation at 900 MHz, 1800 MHz, and 5 GHz via a selective connection of appropriate wireless RF transceivers 35 to the first feed point 45." *Id.*, [0039]. Other frequencies may be obtained by selective connection of appropriate transceivers to the other three feed points. *Id.*, [0040] (examples using the second, third, and fourth feed points to tune the antenna to operating frequencies of 2.45 GHz; 2.1 GHz, 5.2 GHz, and 5.8 GHz; and 1.54 GHz, respectively).

~~In light of the above disclosures~~73.~~Therefore it is my opinion that~~, a POSITA would have understood that Wen uses controller 36 (*i.e.*, ***electronic control***) to tune the antenna by ***selecting*** different leg portions (***passive elements***). ~~EX1003, ¶73.~~ Specifically, by selectively operating individual transceivers, the controller causes the selected transceiver to provide a signal to one of the feed points on a particular leg portion of the antenna, thereby selecting the corresponding leg portion and tuning the antenna to the operating frequency or frequencies associated with that leg portion. Thus, the selective

connection of a transceiver to a feed point on a leg portion is performed via electronic control by the controller. *Id.*; *see also* EX1004, Abstract, [0027], [0031-32], [003940].

74. To the extent PO argues that Wen does not disclose using electronic control to select passive elements for tuning, it is my opinion that Wen also discloses, or at least renders obvious, an ***actively tuned antenna*** because Wen's selective operation of transceivers operates to actively tune the antenna. ~~EX1003, ¶74.~~ Specifically, as ~~described~~I discussed above, Wen discloses a controller that ***actively*** selects different leg portions ("passive elements") by operating transceivers connected to different spaced-apart signal feed points "***to tune the desired operating frequencies*** of the antenna 33." EX1004, [0035]. The controller actively selects to "operate[]" at least some (i.e., two or more) of the wireless RF transceivers 35a-35n to advantageously use the common antenna 33 at a same time." *Id.*, [0031]. ~~A~~In my opinion, a POSITA would have understood, or it would have been obvious, that the selective operation of particular transceivers is accomplished using active circuit elements, such as switches. ~~EX1003, ¶74.~~ In addition, a POSITA would also have reasonably expected to be successful ~~in~~ using active circuit elements, such as switches, to selectively operate Wen's transceivers. ~~Active~~Switches and other active circuit elements, ~~and switches in particular, are basic~~ are standard circuit components that ~~have been~~are routinely used in circuits, and have been for decades, ~~and a~~. A POSITA would have been more than capable ~~to use them~~of using these basic components in Wen's system ~~for their conventional purpose. Id.~~to select individual transceivers.

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