IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

INTELLECTUAL VENTURES I, LLC Plaintiffs, v. RICOH AMERICAS CORPORATION RICOH ELECTRONICS INC., Defendants.	))))))))))	Civ. No. 13-474-SLR-SRF

MEMORANDUM ORDER

At Wilmington this 7th day of January, 2016, having heard argument on, and having reviewed the papers submitted in connection with, the parties' proposed claim construction;

IT IS ORDERED that the disputed claim language of U.S. Patent Nos. 5,444,728, (the '728 patent), 6,130,761 (the '761 patent), 5,712,870 (the '870 patent), and 6,754,195 (the '195 patent) shall be construed consistent with the tenets of claim construction set forth by the United States Court of Appeals for the Federal Circuit in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), as follows:

The '728 Patent

1. **"Selectively switching a main current from a source of the main current alternatively between said laser and said bypass to provide pulses of the main current of said laser:"**[1] "Selectively redirecting a flow of current from a main

[1] Found in claim 17.

current source alternately between the laser and the bypass to provide pulses of the main current to turn the laser on and off." This construction is consistent with the claim language, where the "main current" for energizing the laser is switched, flowing either through the laser to emit light or via a bypass to terminate emission of light by the laser. (2:37-42) This main current, provided by a separate source, "is able to flow continuously at a steady value even though the laser is being pulsed." (2:51-55) "Current from the main source 28 is applied to the laser 12 via the switch 30 ... to direct the main current alternately through the laser 12 and via a bypass path around the laser 12." (4:63-68)

2. **"A current sensor having a terminal connecting to the second terminal of said [laser/device] and to the second terminal of said bypass to provide a signal indicating the amplitude of current flowing through said [laser/device] and [through] said bypass:"**[2] "A component connected to the second terminal of said [laser/device] and to the second terminal of said bypass capable of providing a signal (e.g., current or voltage) indicating the amount of current flowing through the [laser/device] and through said bypass." The specification does not require that the current sensor be a resistor. Instead, the specification uses the language "such as a current-sensing resistor" (4:61-62), indicating that other sensors were known in the prior art. Thus, there is no reason to limit the "signal indicating the amplitude of the current" to be only the voltage across a resistor.

[2] Found in claim 1, 4, and 15.

3. **"Said regulator:"**[3] Not indefinite under 35 U.S.C. § 112, ¶ 2. In pertinent part, claim 1 recites "a bypass switch connecting an output terminal of said regulator to the first terminal of said laser and to the first terminal of said bypass." (15:34-36) While the word "regulator" does not otherwise appear in claim 1, the specification and several other claims refer to a "current-switching regulator" that produces the main current to the laser. (1:13-14, 15:52-53, 16:10, 17:21-35) The court is persuaded by plaintiffs' expert's[4] explanation that a person of skill in the art would know that the "said regulator" of claim 1 refers to the main source of current discussed throughout the specification and claims. The term "said regulator," therefore, is not indefinite under 35 U.S.C. § 112, ¶ 2, as it informs those skilled in the art about the scope of the invention with reasonable certainty.

4. **"Wherein the bypass has an electrical resistance approximating an electrical resistance of said laser to maintain a substantially constant power dissipation of said main current independent of a position of said bypass switch:"**[5] Not indefinite under 35 U.S.C. § 112, ¶ 2. The court is persuaded by plaintiffs' expert's[6] explanation that a person of skill in the art would know that "a resistor can be used to model or approximate the behavior of a laser diode at a known operating point" and that "at a given point of operation, the ratio between the laser's voltage and its current will have the units of resistance," known as the "'equivalent resistance' of the laser at its operating point." (D.I. 79 at ¶¶ 62-63) With this

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[3] Found in claim 1.

[4] Defendant did not provide expert analysis, solely relying on attorney argument.

[5] Found in claim 14.

[6] Defendant did not provide expert analysis, solely relying on attorney argument.

explanation, the phrase "electrical resistance approximating an electrical resistance of said laser" is not indefinite under 35 U.S.C. § 112, ¶ 2, as it informs those skilled in the art about the scope of the invention with reasonable certainty.

The '870 Patent

5. **"Single device:"**[7] "A single packaged device or module that contains one or more integrated circuit chips."[8] Relying on the doctrine of claim differentiation, the court previously construed this term as "[a] single packaged device or module that may contain one or more integrated circuit chips." (Civ. No. 13-473, D.I. 264 at 10-11) On reconsideration, the court maintains the construction as indicated above, but also finds "single device" is limiting as it appears after the word "comprising" in each of the independent claims. *Genentech, Inc. v. Chiron Corp.*, 112 F.2d 495, 501 (Fed. Cir. 1997) (words after "comprising" are limitations).

6. **"Means for receiving an analog signal having modulated thereon in a spread spectrum format a message having a header portion and a data portion:"**[9] The parties do not dispute that the corresponding function is: "Receiving an analog signal having modulated thereon in a spread spectrum format a message having a header portion and a data portion." The corresponding structure is: "Antennae 20 and/or 22 in Fig. 2 and description of same in the specification." The court previously determined the corresponding structure for this term as: "Antennae 20 and/or 22 in

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[7] Found in claim 1.

[8] As to Ricoh's assertion that recent Federal Circuit precedent invokes § 112, ¶ 6, the court notes that this term does not use functional language. Further, "single device" is not a nonce word, so § 112, ¶ 6 does not apply. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc).

[9] Found in claim 1.

Fig. 2 and description of same in the specification, eg. 4:59-64, 5:44-54." (Civ. No. 13-473, D.I. 264 at 13) However, the court finds that merely referencing the specification generally is sufficient, and that pointing to specific examples in the specification is unnecessary.

7. **"Means for demodulating the header of the digital signal using digital binary phase shift keyed (BPSK) demodulation and for demodulating the data portion of the same message using quarterary phase shift keyed demodulation (QPSK) :"**[10] The parties do not dispute that the corresponding function is: "demodulating the header of the digital signal using digital binary phrase shift keyed (BPSK) demodulation and for demodulating the data portion of the same message using quarternary phrase shift keyed modulation (QPSK)." The corresponding structure is: "PSK demodulator 100 in figure 3 and description of same in the specification, and/or element 60 of figure 2 and description of same in the specification." The court previously determined the corresponding structure for this term as: "PSK demodulator 100 in figure 3 and description of same in the specification, e.g., 8:3-13; and/or element 60 of figure 2 and description of same in the specification, e.g., 5:28-30." (Civ. No. 13-473, D.I. 264 at 13-14) However, the court finds that merely referencing the specification generally is sufficient, and that pointing to specific examples in the specification is unnecessary.

8. **"Means for converting said analog signal into a digital signal:"**[11] The parties do not dispute that the corresponding function is: "converting said analog

[10] Found in claim 1.

[11] Found in claim 1.

signal into a digital signal." The corresponding structure is: "A/D converter 54 and/or 56 and description of same in the specification." As the court previously found, while the specification states that "the baseband processor receives the I and Q signals from the modulator/demodulator 42 via the A/D **converters**" (6:63-67) (emphasis added), there is no indication in the claims or the specification that both converters are necessary to perform the function. *See Wegner Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("Under § 112, ¶ 6, a court may not import functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function.").

9. **"Means contained on said single device for timing a transition from BPSK mo[d]ulation to QPSK modulation:"**[12] Not indefinite under 35 U.S.C. § 112, ¶ 2. The parties do not dispute that the corresponding function is: "timing a transition from BPSK modulation to QPSK modulation." The corresponding structure is: "processor interface 114 in Fig. 3 and description of same in the specification." The court previously rejected defendants' indefiniteness argument because the specification sufficiently describes processor interface 114 of Figure 3 as the corresponding structure. (Civ. No. 13-473, D.I. 264 at 15-16; 9:60-63 ("the signaling field, when detected, is used to switch the receiver modulator/demodulator between BPSK and QPSK at the correct time with respect to the data portion of the packet.")) Additionally, plaintiffs' expert offers unrebutted testimony that the means for timing is not merely a "general-purpose computer" or "a generic structure;" it is the processor interface 114, connoting sufficient structure. (D.I. 80 at ¶¶ 29, 35)

[12] Found in claim 1.

10. **"A timer for transitioning between the BPSK demodulation and the QPSK demodulation:"**[13] "A timer hardware and/or software for transitioning between BPSK demodulation and QPSK demodulation." Not indefinite under 35 U.S.C. § 112, ¶ 2. Not subject to 35 U.S.C. § 112, ¶ 6. This construction is consistent with the specification and the court's previous construction, as the specification discloses that the timer operates in concert with "the signaling field," which "is used to switch the receiver modulator/demodulator between BPSK and QPSK at the correct time." (9:59-64) Plaintiffs' expert offers unrebutted testimony that "timer" connotes sufficient structure and is not merely a nonce word. *Williamson*, 792 F.3d at 1350. Specifically, "[a]s one of ordinary skill would understand, a timer in a digital system may be implemented in a number of ways, through timing hardware (typically by counting clock cycles) and/or software (typically through access to a system clock, which itself counts clock cycles)." (D.I. 80 at ¶ 35)

11. **"Means for providing the demodulated data signal to a media access control (MAC) layer:"**[14] The parties do not dispute that the corresponding function is: "providing the demodulated data signal to a media access control (MAC) layer." The corresponding structure is: "Element 62 of Fig. 2 and col. 5:28-34 and/or Element 114 of Fig. 3 and col. 8:62-65." The specification provides that "Figure 3 is a functional block diagram of the baseband processor of Figure 2. (4:36-37; D.I. 80 at ¶ 32) The corresponding description, however, does not describe the recited function of providing the demodulated data to a MAC layer. (8:53-61) Rather, processor interface element

[13] Found in claims 10 and 17.

[14] Found in claim 1.

114 and its description are clearly linked to the recited function of providing the demodulated data to a MAC layer: "Descrambled data may be provided to a processor interface 114 which may control the passage of the data to another device such as a media access control ('MAC') circuit." (8:62-65) Because it is linked to the recited function of providing the demodulated data to a MAC layer, element 114 and col. 8:62-65 can also be corresponding structure.

12. **"Means for adjusting said means for timing to account for headers of variable length:"**[15] Not indefinite under 35 U.S.C. § 112, ¶ 2. The corresponding function is "timing a transition from BPSK modulation to QPSK modulation." The corresponding structure is "processor interface 114 in Figure 3 and description of same in the specification." As the court previously held, the specification, in describing the operation of the processor, states "the timing of switching the receiver from one signaling format to another is time critical . . . the number of fields in the header may be user selectable." (9:18-24; *see also* 9:45-63)

13. **"An interface for providing the demodulated data signal to a media access control (MAC) layer [said MAC layer]:"**[16] The corresponding function is: "providing the demodulated data signal to a media access control (MAC) layer." The corresponding structure is: "Element 62 of Fig. 2 and col. 5:28-34 and/or Element 114 of Fig. 3 and col. 8:62-65." As discussed in paragraph 12, element 114 and col. 8:62-65 can also be corresponding structure because it is linked to the recited function processor interface.

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[15] Found in claim 2.

[16] Found in claims 10 and 17.

14. **"BPSK:"**[17] "Binary phase shift keying, a modulation technique where data is conveyed by modulating the phase of a signal 180 degrees." Inclusion of the phrase "compared by a receiver to the phase of a known reference signal" would limit the term to non-differential demodulation, an improper limitation because the specification includes differential phase shift keyed signals ("DPSK"). (6:53-54) Moreover, element 60 of Figure 2 is labeled "Dpsk Demod.," which is defined as "differential phase shift keyed" demodulation in the context of Figure 3 (6:53-54), showing that the term "BPSK" is not limited to non-differential demodulation.

15. **"QPSK:"**[18] "Quadrature phase shift keying, a modulation technique where data is conveyed by modulating, the phase of a signal 90 degrees." For the reasons discussed in paragraph 14 supra, QPSK is not limited to non-differential demodulation.

16. **"Header:"**[19] "The entire portion of the frame preceding the data portion." Figure 1 shows that "header" labels the entire portion of the frame preceding the data portion. Additionally, the specification uses the term "preamble" interchangeably with "header" to refer to the entire portion of the frame preceding the data portion. (4:44-48 ("As shown in FIG. 1, a typical message may consist of a fixed length preamble having the fields for power ramping, synchronization, a signal field, a descrambling seed, and a unique word. Immediately upon the end of the preamble, the data starts . . . ."); 2:8-11 ("Typical spread spectrum messages generally include a data portion containing the

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[17] Found in claims 1, 10 and 17.

[18] Found in claims 1, 10 and 17.

[19] Found in claims 1-3, 7, 9-13, 15, and 17.

data to be transmitted preceded by a preamble or header portion used for synchronization of the receiver to the signal being transmitted . . . ."). As such, this construction encompasses "header" as it would be understood by one of ordinary skill.

The '761 Patent

17. **"Is obtained by checking a table referring to the predetermined resolution:"** "Is obtained from a table referring to the predetermined resolution." **"Obtaining . . . by checking a table and referring to a predetermined resolution:"**[20] "Obtaining . . . from a table referring to a predetermined resolution." Claims 2, 3, 4, 6, 10 and 12 specify "checking a table referring to the predetermined resolution." As to this step, the specification recites "the required resolutions and the corresponding numbers of rotation steps of the driving motor are listed in a table such as Table 2 for checking the needed number of rotation steps of the driving motor before a scanning process." (6:49-53) The phrase "as an index" is not found anywhere in the patent, nor is a similar step disclosed. This construction is consistent with the claims and specification in that it already requires obtaining values by "referring to a predetermined resolution."

18. **"Obtaining a period of a triggering signal by means of the period of the driving signal and the number of rotation steps for the motor, wherein the period T_G of the triggering signal equals the period of the driving signal T_M multiplied by the number of rotation steps for the motor N within the period T_G:"**[21] "Calculating the period of the triggering signal TG from the equation $T_G=T_M*N$."

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[20] Found in claims 2, 3, 4, 6, 8, 10, and 12.

[21] Found in claims 6 and 10.

Claims 6 and 10 recite "obtaining a period of a triggering signal **by means of** the period of the driving signal and the number of rotation steps," delineating that calculating T_M*N is a necessary step for obtaining the period of a triggering signal. Additionally, this step is described in the summary of the invention as follows: "[T]he period of the triggering signal is determined by the product of the period of the driving signal and the number of rotation steps of the driving motor." (3:67-4:2; 5:1-6) Moreover, "[t]he frequency of the triggering signal T_G, the frequency of the driving signal T_M, and the number of rotation steps of the motor within one triggering period N have a following relationship[:] $T_G=T_M$* N, or $T_M=T_G/N$." (4:14-20)

19. **"Obtaining a period of a driving signal by means of the period of the triggering signal and the number of rotation steps for the motor, wherein the period of the driving signal T_M equals the period T_G of the triggering signal divided by the number of rotation steps for the motor N within the period T_G:"**[22] "Calculating the period of the driving signal T_M from the equation $T_M=T_G/N$." Claims 8 and 12 recite "obtaining a period of a driving signal **by means of** the period of the triggering signal and the number of rotation steps for the motor," delineating that calculating T_G/N is necessary to obtaining the period of a driving signal.

20. **"Number of rotation steps [for the motor] N:"**[23] "Number of rotation steps [for the motor] N, where N is greater than 1 for at least one mode of operation." The purpose of the invention was to "release the driving signal from the limitation of the triggering signal to improve the rotation rate of the driving motor." (3:50-53) The patent

[22] Found in claims 8 and 12.

[23] Found in claims 1, 6, 8, 10, and 12.

disclaims scanners that have no mode of operation in which N is greater than 1 when stating "since the period of the triggering signal is larger than or equal to the product of the period of the driving signal and the number of the rotation steps of the driving motor within one period of the triggering signal, the period of the driving signal is always smaller than or equal to the period of the triggering signal." (5:28-33) It is only in these circumstances that the "the rotation rate of the driving motor is not limited by the period of the triggering signal." (5:34-35) Thus, the invention is only practiced when there are modes with values of N that are greater than 1. Additionally, the N values in Figure 2 and Table 2 are 1, 3, and 4 - not exclusively 1. Finally, the specification states that "[n]ormally, the period of the triggering signal is an integral multiple of the period of the driving signal." (5:27-29). The word "multiple" is a clear indication that N would frequently be greater than 1, because a "multiple" refers to the multiplication of the driving signal by a value so as to obtain the period of the triggering signal. If there are multiple driving signal pulses within the period of triggering signal, N will be greater than 1 in that mode of operation.

21. **"Period ... of the driving signal:"**[24] "Interval of time after which the characteristics of the driving signal waveform repeat." The parties agree that "period" refers to the "interval of time after which the characteristics of the driving signal waveform repeat." While the patent refers to this time period as "the time needed for the driving motor to move the CCD module one step away" (6:64-66), this reference merely describes an embodiment rather than an express definition. *Phillips*, 415 F.3d at 1323 ("although the specification often describes very specific embodiments of the

[24] Found in claims 1, 2, 4, 6, 8, 10, and 12.

invention, we have repeatedly warned against confining the claims to those embodiments."). Requiring this term to correspond to one motor step would additionally nullify the formula for calculating the period of the driving signal discussed in paragraph 19 supra.

22. **"Determining a driving signal, a triggering signal, and a number of rotation steps according to a predetermined resolution, wherein a period T_G of the triggering signal equals a period T_M of the driving signal multiplied by the number of rotation steps N within the period T_G:"**[25] "Determining a period (T_M) of a driving signal, a period (T_G) of a triggering signal wherein T_G is not less than T_M, and a number of rotation steps (N) within the period T_G, according to a predetermined resolution, and wherein the relationship between the parameters follows $T_G = T_M * N$." This construction is consistent with the court's prior construction and the specification, which states "[a] frequency of the triggering signal can be obtained according to the predetermined resolution and the period of the driving signal ... ". (4:10-12) This construction additionally clarifies the "wherein" clause and that "T_G is not less than T_M."

The '195 Patent

23. **"Channel impulse response estimate obtainable from the first portion is reusable for acquisition of the second portion:"**[26] "Channel impulse response estimate that can be obtained from the first portion can be reused for acquisition of the second portion." This construction is consistent with the language of claim 1, which recites: "the waveform being specified so that a channel impulse

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[25] Found in claim 1.

[26] Found in claim 1.

response estimate obtainable from the first portion is **reusable** for acquisition of the second portion." (13:9-11) The specification - which teaches that the channel impulse response is used for acquisition of the first portion then reused for acquisition of the second portion - additionally recites "reusable" throughout. (Abstract, 2:52-55, 3:62-4:4, 5:29-48, 7:10-22)

24. The court has provided a construction in quotes for the claim limitations at issue. The parties are expected to present the claim construction to the jury consistently with any explanation or clarification herein provided by the court, even if such language is not included within the quotes.

United States District Judge