IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

MASIMO CORPORATION, Plaintiff, v. PHILIPS ELECTRONICS NORTH AMERICA CORPORATION and PHILIPS MEDIZIN SYSTEME BÖBLINGEN GMBH, Defendants.	)	Civil Action No. 09-80-LPS-MPT
PHILIPS ELECTRONICS NORTH AMERICA CORPORATION, Counterclaim-Plaintiff, v. MASIMO CORPORATION, Counterclaim-Defendant.	)	

REPORT AND RECOMMENDATION

I. INTRODUCTION

Plaintiff Masimo Corporation ("Masimo") and defendants, Philips Electronics North American Corporation and Philips Medizin Systeme Böblingen (collectively, "Philips"), manufacture competing pulse oximetry products. Pulse oximetry allows for the non-invasive measurement of blood oxygen saturation. Modern pulse oximeters permit users to monitor patients continuously and in real time. Where previous

technology could not provide accurate data in the presence of motion induced "noise," the products manufactured by both Masimo and Philips remove, filter, or circumvent the "noise" to generate more accurate data points.

Masimo initiated this action on February 3, 2009 alleging infringement. In an amended complaint, Masimo alleges that Philips' production, use, and sale of pulse oximeters incorporating Philips' "Fourier Artifact Suppression Technology" as well as Philips' IntelliVue line of patient monitors infringes 14 of Masimo's patents. Philips North America filed counterclaims against Masimo asserting infringement of 10 of Philips' patents through the production, use, and sale of various Masimo monitors, boards, sensors, and oximeters using patent Philips technology. Since the commencement of litigation, the parties have limited their asserted patents. Masimo alleges infringement of U.S. Patent Nos. 6,263,222 ("the '222 patent"), 5,632,272 ("the '272 patent"), 7,215,984 ("the '984 patent"), and 6,699,194 ("the '194 patent"). Philips alleges infringement of U.S. Patent Nos. 6,122,535 ("the '535 patent"), 6,725,074 ("the '074 patent"), and 5,448,991 ("the '991 patent").

On December 1, 2010, the court conducted a *Markman*[1] hearing on the parties' respective constructions of several disputed terms of the asserted claims. This order sets forth the court's construction of those terms.

II. ANALYSIS

A. Analysis of Masimo's Asserted Patents

1. '222 Patent - Signal Processor (Claim 17)

[1] *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 372 (1996).

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
"a **signal processor** responsive to the first and second intensity signals to calculate arterial oxygen saturation without significant interference in the calculation from the motion induced noise portion of the first and second intensity signals."	No Construction Necessary or, in the alternative, "a device that processes an input or output signal."	"A processing unit which determines either a secondary reference n'(t) or a primary reference s'(t) for use in a correlation canceler, such as an adaptive noise canceler."

The Federal Circuit has found that "[o]ne purpose for examining the specification is to determine if the patentee has limited the scope of the claims."[2] "Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question."[3]

In the "Detailed Description of the Invention" ("Detailed Description") for the '222 patent, the patentee declares that "[t]he present invention is a processor which determines either a secondary reference n'(t) or a primary reference s'(t) for use in a correlation canceler, such as an adaptive noise canceler."[4] The "Summary of the Invention" ("Summary") similarly states that "[t]he signals are processed via the signal processor of the present invention to acquire either a secondary reference or a primary

[2] *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000).
[3] *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.,* 242 F.3d 1337, 1341 (Fed. Cir. 2001).
[4] D.I. 140, Ex. 1 at 12:61-64.

reference which is input to a correlation canceler, such as an adaptive noise canceler."[5] Later, the Summary again describes "a processor of the present invention [that] removes the primary signal portions from the measured signals yielding a secondary reference . . . [which, along with] at least one of the measured signals are input to a correlation canceler . . . ."[6] Although claim 17 does not explicitly recite the correlation canceler limitation, where the patentee repeatedly states that the described invention is "for use in a correlation canceler," the court is entitled to take the patentee at his word.[7]

In opposition, Masimo argues that the patentee's use of permissive language suggests that a correlation canceler may or may not be required and, as a result, the patent teaches away from a correlation canceler limitation. The patent states that "[t]he signal processor may comprise a correlation canceler, such as an adaptive noise canceler,"[8] and later that "[t]he signal processor may comprise a joint process estimator."[9] However, permissive language stating that the invention "may" be subject to a certain limitation is insufficient to disclaim an otherwise explicit limitation.[10] As a result, the court interprets the term "signal processor" to mean "[a] processing unit which determines either a secondary reference n'(t) or a primary reference s'(t) for use in a correlation canceler, such as an adaptive noise canceler."

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[5] *Id*. at 4:54-57.

[6] *Id.* at 5:30-36.

[7] *See Honeywell Int'l, Inc. v. ITT Indus.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006); *see also id*. ("Here the written description uses language that leads us to the conclusion that a fuel filter is the 'only injection system component' that the claims cover . . . On at least four occasions, the written description refers to the fuel filter as 'this invention' or 'the present invention.'").

[8] D.1. 140, Ex. 1 at 6:31. A "joint process estimator" is a type of adaptive noise canceler. *See id*. at 6:32-34 ("The adaptive noise canceler may comprise a joint process estimator having a least-squares-lattice predictor and a regression filter.").

[9] *Id*. at 8:11-12.

[10] *Watts*, 232 F.3d at 883 (negating permissive language in light of the entirety of the disclosure because the specification never explicitly discussed an embodiment without the proposed limitation).

2. '272 Patent - Signal Model (Claims 9, 14)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
"In a signal processor for processing at least first and second measured signals, each containing a primary signal portion and a secondary signal portion, said first and second signal substantially adhering to a predefined signal, a method comprising the steps of: *** from said selected at least one comparison value, determining a resulting value consistent with the predefined **signal model**.	"The relationship between two physiological signals which follows certain conditions."	"The signal model defined by: $S_1 = s_1 + n_1$ $S_2 = s_2 + n_2$ with $s_1 = (r_a)(s_2)$ and $n_1 = (r_v)(n_2)$ or $r_a = (s_1)/(s_2)$ and $r_v = (n_1)/(n_2)$ where s_1 and n_1 are at least somewhat (preferably substantially) uncorrelated and s_2 and n_2 are at least somewhat (preferably substantially) uncorrelated. The first and second measured signals S_1 and S_2 are related by correlation coefficients r_a and r_v as defined above."

The court adopts Masimo's proposed construction and determines that "signal model," as used in claims 9 and 14 means "[t]he relationship between two physiological signals which follows certain conditions." The court rejects Philips' construction which would expand an exemplary statement into a definitional statement. Although the Detailed Description states that a signal model in accordance with the present invention is defined as Philips' proposed construction,[11] it later states that "[t]he primary and secondary signals according to this model may be written" as the function of another set of variables.[12] Further alternate relationships between two measured signals are

[11] *Id.* at 9:28-43.
[12] D.I. 140, Ex. 1 at 17:25-43.

described at 22:31-61, 58:47-59:14, and 59:15-64.[13] Despite the Federal Circuit's finding that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess,"[14] where the specification specifically mentions alternative signal models, the court will not restrict the claims.[15]

3. '272 Patent - "comparing" (Claim 9)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
comparing said first and second transformed series of points to obtain a third series of comparison values having a magnitude component and at least a frequency component;	"relating one or more points in a first group with point(s) in a second group to obtain a group of comparison values having a magnitude component and at least a frequency component"	"calculating point-by-point comparisons of the first and second transformed signals"

The court adopts Philips' proposed construction and determines that "comparing," as used in claim 9, refers to "calculating point-by-point comparisons of the first and second transformed signals." While Masimo's proposed construction cites one of the many definitions of "series," from *Webster's* dictionary as the ordinary definition, that construction overlooks a number of alternative definitions cited in that very reference, and overlooks the context in which the term "comparing" is used in the

[13] *Id*., Ex. 1 at 22:31-61; *Id*., Ex. 1 at 58:47-59:14; *Id*., Ex. 1 at 59:15-64.

[14] *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005).

[15] *Contra Watts*, 232 F.3d at 883 ("Examining the context of this statement and the entirety of the disclosure, we do not agree that this statement discloses an embodiment without misaligned taper angles . . . The specification does not explicitly discuss an embodiment without misaligned taper angles and . . . actually limits the invention to embodiments with misaligned taper angles.").

claim.[16] The *Webster's* definition states that a "series" may be "a group or number of similar or related things arranged in a row" or "a group or number of related or similar persons, things, or events coming one after another, sequence; succession."[17] Claim 9 states that each series being compared has "at least a frequency component and magnitude component," and that the resulting "series of comparison values [has] a magnitude component and at least a frequency component."[18]

Although the specification includes embodiments that use only some of the transformed points,[19] the specification does not require that every point in the first series be compared to every point in the second series. Rather, the specification states that where a comparison is done, that comparison must be done on a frequency-consistent, or a point-by-point, basis.[20]

Finally, Masimo argues that the presence of a dependent claim 10, which explicitly states the point-by-point limitation gives rise to a presumption that the limitation is not present in the independent claim 9.[21] Claim 10 states that the "method of claim 9, wherein said step of comparing comprises determining a series of ratios on a point-by-point basis . . . and wherein said step of selecting at least one of said comparison values comprises the step of selecting the lower of the ratios."[22] Where claim 9 requires a comparison of a "transformed series of points," claim 10 requires that

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[16] D.I. 164 at 10 ("The ordinary meaning of 'series' is 'group.'") (citing D.I. 166, Ex. 16 at 1300 ("series" means "a number of things produced as a related group . . . .").

[17] D.I. 166, Ex. 16 at 1300.

[18] D.I. 140, Ex. 6 at 66:10-20.

[19] *Id*. at 55:14-58:45 (However, a further test is performed to qualify the points for which a ratio is taken . . . For those sample points which qualify, a ratio is taken in the ratio module 670."

[20] *Id*. ("The point-by-point ratio module takes the red over infrared ratio of the values on a point-by-point basis.").

[21] *See Phillips*, 415 F.3d at 1315.

[22] D.I. 140, Ex. 6 at 66:26-31.

these points be "a series of ratios."[23] The dependent claim adds the limitation that the comparison be of a series of ratios and, as a result, claim differentiation is inapplicable.

4. '272 Patent - "determining" (Claim 14)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
determining a series of ratios of magnitudes with respect to frequency of ones of said first transformed series of points to ones of said second transformed series of points;	No Construction Necessary	"calculating point-by-point comparisons of the first and second transformed signals"

For the same reasons outlined in the construction of "comparing," the court adopts Philips' proposed construction and determines that "determining a series of ratios," as used in claim 14, refers to "calculating point-by-point comparisons of the first and second transformed signals."

5. '984 Patent - "calculation technique" (Claims 1, 52 and 53)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
a first calculator capable of utilizing a first **calculation technique** to determine at least a first value representative of the at least one physiological characteristic of the pulsing blood, a second calculator capable of utilizing a second	No Construction Necessary or, in the alternative, "a manner of using mathematics to make a determination"	"A first [or second] algorithm based on the disclosed signal model"

[23] *Id*. at 66:10-31.

calculation technique different from the first **calculation technique**, to determine at least a second value representative of the at least one physiological characteristic, and		

As a consequence of the court's finding that "signal model" means the "relationship between two physiological signals which follows certain conditions," the court finds that no additional construction is necessary for the term "calculation technique."

6. '194 Patent - "Center of Mass" (Claims 11, 14 and 16)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
The method of claim 10, wherein said pulserate is estimated according to a **center of mass** of at least a portion of said series of spectral peaks. *** using results from a **center of mass calculation** of at least a portion of said spectral values to estimate said pulserate *** estimate said pulserate from said series of spectral peaks as a function of a **center of mass type of calculation** of at least a	No construction necessary or, in the alternative, "the balancing point"	"a threshold value g for ratio lines R_N associated with the first N spectral peaks according to the following formula: g = N/(summation of $1/R_i$ from i=0 to N -1)"

portion of said series of spectral peaks.		

Philips' argues that the specification describes only one center of mass calculation. The specification states that "[i]n a preferred embodiment . . . [t]he ratio threshold g is then computed as a modified center of mass for the R_N lines according to the" equation outlined in the proposed construction. The Federal Circuit has found that "[i]t is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'"[24] "[A]lthough the specification often describes very specific embodiments of the invention, [the Federal Circuit has] repeatedly warned against confining the claims to those embodiments."[25] The specification describes the computation for a "modified center of mass" according to the equation outlined in Philips' proposed construction, but the claims state that the pulserate may be estimated using "a center of mass," or "a center of mass calculation."[26] Philips' does not provide any statements demonstrating the patentee's intent to limit the general "center of mass" calculation to any singular equation.[27] As a result, the court finds that no construction is necessary for "center of mass."

7. '194 Patent - "classifying" terms (Claims 3, 4, 5, 8, 10, 14, 16 and 17)

[24] *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)).

[25] *Id*. at 1323.

[26] D.I. 140, Ex. 5 at 26:10-67.

[27] *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) ("Even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.").

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
classifying said three or more spectral peaks into a first group comprising one or more spectral peaks corresponding to a fundamental frequency and a second group comprising one or more harmonics of said fundamental frequency; and *** **classifying** said plurality of spectral peaks into a first group comprising one or more spectral peaks corresponding to a fundamental frequency and a second group comprising one or more harmonics of said fundamental frequency; and	No Construction Necessary	"categorizing by matching . . . to one of the idealized spectra shown by the plots 1600, 1610, 1620, 1630, or 1640 in Figs. 16 A-C"

The court finds that no construction is necessary for the term "classifying." The specification states that according to one aspect of the invention, "the pulserate can be determined in the presence of FM and AM distortions by classifying the spectrum as one of five categories grouped into three cases.[28] The specification further provides that in accordance with one aspect of the invention, "the pulserate is determined by identifying the largest three spectral lines, then matching the spectrum to one of the idealized spectra shown by the plots 1600, 1610, 1620, 1630, or 1640, and then

[28] D.I. 140, Ex. 5 at 18:21-25.

applying one of a set of rules to determine the pulserate."[29] Philips argues that these passages illustrate that the term "classify" is used in the context of classifying the peaks in the frequency domain. Further, Philips argues that classifying peaks in the frequency domain requires matching the spectrum to one of five plots because this matching is the only rule-based approach disclosed in the specification.

Philips recognizes that even when the specification describes only a single embodiment, without more, the claims of a patent will not be read restrictively. However, Philips points to *Decisioning.com, Inc. v. Federated Dept. Stores, Inc.*,[30] for the proposition that where the essence of the patent is restricted to the singular embodiment, the claims cannot enlarge what is patented beyond the inventor's description. Nowhere in the asserted claims (claims 3-5, 8, 10, 14, and 16-17) does the patentee define these "classifying terms" as requiring the matching of spectral peaks to one of the idealized spectra shown in the numbered plots.[31] To the contrary, the patentee directs the patent away from a literal comparison to plots 1600-40 via a statement advising that a person skilled in the art would understand that "although the frequencies of the spectral shown in the plots 1600, 1610, 1620, 1630, or 1640 appear to be harmonically related[, in practice] the spectral lines may not correspond to frequencies which are harmonics."[32] Philips fails to demonstrate the patentee's clear intent requiring a "matching [of] three or more spectral peaks to one of the idealized

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[29] *Id*. at 19:5-10.

[30] 527 F.3d 1300 (Fed. Cir. 2008).

[31] *See* D.I. 140, Ex. 5 at 24:28-28:3 (reciting a variation of the requirement to classify a number of spectral peaks into a first group corresponding to a fundamental frequency and a second group comprising one or more harmonics of that fundamental frequency).

[32] D.I. 140, Ex. 5 at 19:10-14.

spectra shown by the [listed] plots." As a result, the court finds that no construction is necessary to clarify the "classifying" terms in claims 3-5, 8, 10,, 14 and 16-17.

8. '194 Patent - "one or more rules" (Claims 1, 2, 6, 15, 19, 20-22)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
select a selected portion of said spectral-domain representation based on one **or more rules** relating to characteristics of spectral lines in said selected portion and one or more harmonics of spectral liens in said selected portion; and	No Construction Necessary or, in the alternative, "guidelines"	"a defined set of mathematical and logical steps that includes comparing the relative magnitudes of up to the three largest spectral peaks according to their amplitudes and frequencies in order to match the peaks to one of the idealized spectra shown by the plots 1600, 1610, 1620, 1630, or 1640 in Figs. 16A-C"

Having rejected Philips' proposed construction for "classifying" terms, the court similarly rejects Philips' proposed construction for "one or more rules" and finds that "one or more rules" means "guidelines." As with "classifying," Philips' proposed construction would read limitations from the specification into the claim. The patentee expressly guides the patent away from a literal comparison to plots 1600, 1610, 1620, 1630, or 1640.[33]

9. '194 Patent - "spectral domain waveform/dataset/representation" (Claims 1, 3, 4, 5, 8, 10, 14, 15, 16, 17)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction

[33] *Id*. at 19:10-14.

transforming a time-domain plethysmograph waveform into a **spectral domain waveform**; identifying a plurality of spectral peaks in said **spectral domain waveform**	No Construction Necessary for "dataset," "waveform," and "representation" "Spectral domain" means "function of frequency"	"representation of the frequency components of a signal that has been scrubbed by applying a motion artifact removal process to obtain a signal that that is ideally cleaner (e.g. has a better signal to noise ratio)"

The parties have stipulated that the term "spectral" is defined as "frequency-related."[34] Philips argues that the specification clearly states that the rule-based algorithm described in the '194 patent is designed to work only on a scrubbed signal. Consequently, Philips argues, the definition of these "spectral domain" related terms requires a "motion artifact removal" limitation. Philips directs the court's attention to two preferred embodiments described in the specification. Both preferred embodiments state that "the spectrum must be scrubbed . . . ."[35] The Federal Circuit, however, has repeatedly warned that a "description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims."[36]

For additional evidence of the patentee's clear intent to limit the claims, Philips points to the patent's description of figures 12 and 14A. Figure 12 "shows a block diagram of a signal processing system" and provides that "[i]deally, the waveform at terminal 1249 is cleaner (i.e. has a better signal to noise ratio) than the waveform at

[34] D.I. 162 at 22.
[35] D.I. 140, Ex. 5 at 15:26-27, 15:37.
[36] *Decisioning, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) (citing *Liebel-Flarsheim*, 68 F.3d at 906).

either scrubber input A or scrubber input B."[37] Figure 14A "shows an ideal spectrum F(ω) of a clean plethysmographic wave from a heart that is beating with every regular beat."[38] These descriptions are insufficient to demonstrate the patentee's intent to limit the claims' scope.[39] The court finds that Philips' proposed construction would improperly read the specification into the claims and, as a result, finds that no construction is necessary for "dataset," "waveform," and "representation."

B. Analysis of Philips' Asserted Patents

10. '535 Patent - "selecting physiologically relevant first and second spectral values . . ." (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
selecting physiologically relevant first and second spectral values by evaluating said first and second spectral values according to criteria selected in accordance with the patient's physiological parameters;	"using criteria selected in accordance with the patient's physiological parameters, making adaptive selections from among a plurality of complex combinatorial values to assure that artifacts and noise are reduced or eliminated from the measurement quantities"	"selecting first and second spectral values that are determined to have physiological relevance based on criteria selected in accordance with characteristics of the specific patient being monitored"

Claim 1 if the '535 patent provides that the invention being claimed is a method of determining at least the concentration of a blood component from the intensity of

[37] D.I. 140, Ex. 5 at 16:30-32.
[38] *Id*. at 17:20-22.
[39] *Laryngeal Mask Co. Ltd. v. Ambu*, 618 F.3d 1367, 1372 (Fed. Cir. 2010) ("This sentence, which as its language indicates, describes what is shown in Figures 5 and 6, is not enough to require every backplate to include a tube joint. To be his own lexicographer, a patentee must use a 'special definition of the term [that] is clearly stated in the patent specification or file history.'") (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1580 (Fed. Cir. 1996)).

electromagnetic waves with at least two selected wavelengths reflected by or transmitted through a patient's tissue.[40] The method comprises of a number of steps including the selection of "physiologically relevant first and second spectral values by evaluating [those] spectral values according to criteria selected in accordance with the patient's physiological parameters."[41] Claim 3, a dependent claim, replaces the quoted step with the forming of complex combinatorial values from the two spectral values and the selecting of combinatorial values according to criteria selected according to the patient's physiology.[42] The presence of a dependent claim adding a particular limitation raises a presumption that the limitation in question is not found in the independent claim.[43]

To counter the claim dependency presumption, Masimo points to the prosecution history of the '535 patent where, in response to a prior art rejection by the Patent and Trademark Office ("patent office"), the applicants stated that "[a]ccording to a preferred embodiment . . . the signals are transformed into a frequency domain, using a Fourier transformation, so as to create complex combinatorial values."[44] Masimo argues that this disclaimer is unequivocal and limits the patent scope to require complex combinatorial values.

The patent office rejected a number of the applicant's claims under 35 U.S.C. § 102(b) as anticipated by a previously issued patent.[45] According to the examiner, "[t]he

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[40] D.I. 140, Ex. 13 at 12:42-47.
[41] *Id*. at 12:57-60.
[42] *Id*. at 13:1-8.
[43] See *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001);
[44] D.I. 172, Ex. 16 at PHIL0321125.
[45] *See* D.I. 172, Ex. 16 at PHIL0321113.

prior art teaches a variety of systems for optically determining concentration of components in tissue, but does not teach or suggest a method or apparatus that includes forming complex combinatorial values, selecting physiologically relevant combinatorial values, and calculating a concentration based on the selected combinatorial values, as set forth in the claims."[46] The applicants countered that, while the prior art "discloses a blood oxygenation system [that] involves no selection activity from the derived complex measurement values . . . [a]pplicants make adaptive selections from among a plurality of complex values . . . ."[47]

Regarding disclaimers in the prosecution history, the Federal Circuit has found that "the alleged disavowing actions or statements made during prosecution [must] be both clear and unmistakable."[48] Here, the applicants' statement regarding "complex combinatorial values" arises in relation to a preferred embodiment. The disclaimer regarding "adaptive selections from among a plurality of complex values" arose to contrast the absence of "selection activity" in the prior art. As a result, the court cannot conclude that the statements constitute a clear and unmistakable surrender of claim scope and adopts Philips' proposed construction.

11. '535 Patent - "complex combinatorial values" (Claim 3, 6, 9, 10)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
forming **complex combinatorial values** from said first and second	"forming values with a magnitude component equal to $\sqrt{(\hat{S}_{Rk}^2 + \hat{S}_{IRk}^2)}$	"values formed from both first and second spectral values"

[46] *Id*.
[47] *Id*. at PHIL0321126.
[48] *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003).

spectral values;	and a phase component equal to ($\hat{S}_{Rk}^2$ / $\hat{S}_{IRk}^2$)"	

Philips concedes to Masimo's proposed construction regarding "complex combinatorial values." Therefore the court finds that "complex combinatorial values" means "forming values with a magnitude component equal to $\sqrt{}$ ($\hat{S}_{Rk}^2$ + $\hat{S}_{IRk}^2$) and a phase component equal to ($\hat{S}_{Rk}^2$ / $\hat{S}_{IRk}^2$)."

12. '535 Patent - "concentration" (Claims 1, 2, 3, 11, 12)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
A method of determining at least the **concentration** of a blood component from the intensity fo electromagnetic waves with at least two selected wavelengths which are reflected by a patient's tissue or transmitted through the patents tissue,	"the relative content of a component dissolved in a known or measured quantity of another substance (such as blood or water) that may be expressed in percentage by weight or by volume, in parts per million, or in grams per liter"	No Construction Necessary In the alternative: "oxygen saturation" or "the percentage of hemoglobin that is oxygenated"

Throughout the '535 patent, the patentees use the term "concentration" as analogous to gas saturation and oxygen saturation.[49] The patent also defines oxygen saturation as a unitless ratio.[50] Masimo does not point to any explicit language

[49] *See* D.I. 140, Ex. 13 at 1:5-11 ("The present invention refers to a method and an apparatus for determining the concentration of a component from the intensity of electromagnetic waves with at least two selected wavelengths which are reflected by human tissue or transmitted through human tissue, e.g. for determining a gas saturation, particularly the oxygen saturation."); *Id.* at 3:43-48 ("When used for determining the concentration of a component, e.g., the gas saturation, from the intensity of electromagnetic waves . . . ."); *Id*. at 3:54-60 ("In accordance with a second aspect, the present invention provides a method of determining at least the concentration of a component, e.g. a gas saturation, from the intensity of electromagnetic waves . . . .").

[50] *Id*. at 2:5-10 (defining oxygen saturation as a function of ($ln(R_1/R_2)/ln(IR_2/IR_2)$); *Id*. at 1:45-50 (incorporating by reference the medical definition of oxygen saturation from U.S. Patent No. 4,167,331).

otherwise defining "concentration." Consequently, the court finds that "concentration" is defined as "oxygen saturation."

13. '074 Patent - "uncertain logic" (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
(b) interlinking the factors by means of an **uncertain logic** including fuzzy logic, into a quality indicator wherein the quality indicator quantitatively describes a quality of a determined measurement value fo the measurement signal.	Indefinite In the alternative: "Logic that requires uncertainty in the reasoning process"	"logic that is non-binary"

The '074 patent deals with the generation of signal quality indicators through an "uncertain logic" analysis. The parties agree that "classical logic" requires that a proposition be represented in binary form as either a 1 (true) or 0 (false). Philips' argues that, in contrast to classical logic, "uncertain logic" allows for a more nuanced categorization, without requiring that each proposition be classified into one of two groups. By combining the analysis of a number of variables, the invention described in the patent generates, via a point system, a score between 0 and 100 regarding the accuracy of a physiological reading.[51] In describing the invention, the patent repeatedly states that "uncertain logic" includes "fuzzy logic," which both parties agree is a type of non-binary logic. As a result, the court finds that the term "uncertain logic" is not "insolubly ambiguous [such that] no narrowing construction can properly be adopted."[52]

[51] *See* D.I. 140, Ex. 14 at 12:55-60.
[52] *Praxair, Inc. v. ATMI, Inc.*, 546 F.3d 1306, 1319 (Fed. Cir. 2008).

To the contrary, the court finds that by repeatedly describing "fuzzy logic" as a subset of "uncertain logic," the patent limits the definition of "uncertain logic" to "logic that is non-binary."

14. '074 Patent - "fuzzy logic" (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
(b) interlinking the factors by means of an uncertain logic including **fuzzy logic**, into a quality indicator wherein the quality indicator quantitatively describes a quality of a determined measurement value fo the measurement signal.	1. "A system that uses inputs that are extracted from fuzzy sets (fuzzification), a fuzzy reasoning process (inference), and outputs that may be obtained by defuzzification of fuzzy set (defuzzification)." 2. "Multivalued (as opposed to binary) logic developed to deal with imprecise or vague data. Classical logic holds that everything be expressed in binary terms: 0 or 1, black or white, yes or no; in terms of Boolean algebra, everything is in one set or another, but not in both. Fuzzy logic allows for partial membership in a set, values between 0 and 1, shades of gray and maybe; it introduces the concept of the 'fuzzy set.'"	"logic that combines input values in a quantitative manner to generate a non-binary result"

During oral argument, the parties agreed to define "fuzzy logic" as "multivalued (as opposed to binary) logic developed to deal with imprecise or vague data. Fuzzy

logic allows for partial membership in a set, values between 0 and 1, shades of gray and maybe; it introduces the concept of the 'fuzzy set.'"

15. '991 Patent - "reference signal having a fixed level" (Claims 1, 3)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
(a) generating a **reference signal having a fixed level** during an oxygen saturation monitoring interval;	"reference signal having a fixed level" means: "permanently set voltage without using gain compensation (i.e. feedback control circuitry) of any sort"	"reference signal having a fixed level during an oxygen saturation monitoring interval" means: "a signal produced by a reference voltage that is not subject to variation over the entire period during which the oxygen saturation level is computed"

The '991 patent is a continuation of U.S. Patent No. 5,190,038. Claim 1 of the '991 patent recites a "method of measuring oxygen saturation in the blood of a living person, comprising the steps of: (1) generating a reference signal having a fixed level during an oxygen saturation monitoring interval; (2) during said oxygen saturation monitoring interval, generating light having a first wavelength and light having a second wavelength . . . ."[53] Although claim 1 provides for a fixed reference signal during an oxygen saturation monitoring interval, Masimo argues that during the prosecution of the '038 patent, the applicants limited the reference signal to a permanently fixed level.

A "prosecution disclaimer may arise from disavowals made during the prosecution of ancestor patent applications,"[54] however the disclaimer must be a clear

[53] D.I. 140, Ex. 11 at 14:61-68.
[54] *Omega Eng'g*, 334 F.3d at 1333 (Fed. Cir. 2003).

and unmistakable surrender of subject matter.[55] To overcome prior art during the prosecution history of the '038 patent, the applicants noted that the pulse oximeter described in the prior art "requires feedback circuitry and a routine (646) which adjusts the LED intensities to correct 'electrical values' when 'data is over or undervalued electronically, i.e. beyond the voltage range of the circuitry,' thus clearly teaching away from the principles of the present invention."[56] The applicants further stated that the claimed invention is "preprogrammed to (1) know the minimum and maximum, signal levels statistically possible (i.e. expected) at the light detectors, and (2) accommodate these expected minimum and maximum signal levels without using gain compensation (i.e. feedback control circuitry) of any sort."[57] The court finds a clear disclaimer concerning the absence of "gain compensation (i.e. feedback control circuitry) of any sort" in relation to the invention's accommodation of the expected minimum and maximum signal levels. However, there is no similar clear and unmistakable disclaimer regarding the lack of gain compensation in other areas and with regard to the time period over which the reference signal is fixed. The disclaimers allow for a reasonable interpretation suggesting that the reference signal may be changed or modified when oxygen saturation is not being monitored, but gain compensation may not be used to modify the expected minimum and maximum signal levels.

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[55] *Cordis Corp. v. Medtronic Ave, Inc.*, 511 F.3d 1157, 1177 (Fed. Cir. 2008) ("[A]n applicant can make a binding disavowal of claim scope in the course of prosecuting the patent, through arguments made to distinguish prior art references. Such argument-based disavowals will be found, however, only if they constitute clear and unmistakable surrenders of subject matter.") (citations omitted); *cf. SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1287 (Fed. Cir. 2005) ("There is no 'clear and unmistakable' disclaimer if a prosecution argument is subject to more than one reasonable interpretation, one of which is consistent with a proffered meaning of the disputed term.").

[56] D.I. 166, Ex. 8 at MASP0021980.

[57] *Id*. at MASP0021975.

Therefore, the court finds that "reference signal having a fixed level during an oxygen saturation monitoring interval" means "a signal produced by a reference voltage, without the use of gain compensation (i.e. feedback control circuitry) of any sort, that is not subject to variation over the entire period during which the oxygen saturation level is computed."

16. '991 Patent - "having a dynamic range . . ." (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
having a dynamic range extending from at least said expected minimum signal magnitude to at least said expected maximum signal magnitude	"having an operational range sufficient to accommodate the minimum to the maximum signal levels possible from a sensor without compensation of any kind"	"having a dynamic range sufficient to accommodate the entire input signal without compensation of any kind extending from an expected minimum signal magnitude to an expected maximum signal magnitude during an oxygen saturation monitoring interval"

During oral argument, Philips conceded that "operational range" and "dynamic range" are essentially synonymous. The parties also agree to the claim language of "statistically possible (i.e. expected)" in place of "possible" and "expected."

As a result of the court's construction of "reference signal having a fixed level during an oxygen saturation monitoring interval," and in light of the repeated assertions in claim 1 that the appropriate signals are generated only during the an oxygen saturation monitoring interval,[58] the court finds that "having a dynamic range extending

[58] *See Phillips*, 415 F.3d at 1313 ("Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.").

from at least said expected minimum signal magnitude to at least said expected maximum signal magnitude," is defined as "having an operational range sufficient to accommodate the entire signal without compensation of any kind extending from a statistically possible (i.e. expected) minimum signal magnitude to a statistically possible (i.e. expected) maximum signal magnitude during an oxygen saturation monitoring interval."

17. '991 Patent - "invalidating. . ." (Claim 7)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
(e) **invalidating** a second number of said output data structures on the basis of one or more of said set of parameters, each said invalidated output data structure being precluded from use in the computation of oxygen saturation levels;	"indicating as not being valid"	No Construction Necessary

During oral argument, Philips conceded to Masimo proposed construction. Therefore, the court finds that "invalidating" is defined as "indicating as not being valid."

18. '991 Patent - "computer processing means . . ." (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
(f) processing said first and second digital signals in **computer processing means** so as to	Function: computing the oxygen saturation level of said blood during said oxygen saturation monitoring interval Structure: A central processing unit 100 programmed to execute (1) a filter block 270 to determine I(t), R(t), I'(t) and R'(t),	Function: computing the oxygen saturation level of said blood during said oxygen saturation monitoring interval

compute the oxygen saturation level of said blood during said oxygen saturation monitoring interval.	(2) a fixed threshold peak detector 310 to detect the peaks, both positive and negative, of the incoming waveform for each pulsation of blood flowing in the person being monitored, (3) a threshold detector 320 to determine whether the current values lie within the preset limits and to alert a data validator 380 to identify aberrant input data, and (4) Saturation Processor 360 which calculated the oxygen saturation level for each pulsation not including invalid data using the following function: $OUT_{SAT} = f((I_{mean}/I_{mag})*(R_{mag}/R_{mean}))$ Where: $I_{mag} = I'(t_{max}) - I'(t_{min})$ $R_{mag} = R'(t_{max}) - R'(t_{min})$ $I_{mean} = [I(t_{max}) + I(t_{min})]/2$ $R_{mean} = [R(t_{max}) + R(t_{min})]/2$	Structure: central processing unit 100 programmed to execute software including a saturation processor 360 utilizing a well established calculation algorithm to calculate the oxygen saturation level as follows: $OUT_{SAT} = f((I_{mean}/I_{mag}) * (R_{mag}/R_{mean}))$

The parties agree this is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6 which recites:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof.

"Claim construction of a means-plus-function limitation includes two steps. First, the court must determine the claimed function. Second, the court must identify the corresponding structure in the written description of the patent that performs that function."[59]

First, the parties agree that the function of the invention described in claim 1 is to "comput[e] the oxygen saturation level of [blood during the] oxygen saturation

[59] *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1333 (Fed. Cir. 2006).

monitoring interval." The court will then consult the written description to determine the corresponding structure necessary to accomplish the stated function.[60] The patent states that "[s]aturation processor 360 is the routine that actually calculates the oxygen saturation level . . . [t]he saturation processor utilizes a well established saturation calculation algorithm to calculate the oxygen saturation level . . . as follows: $OUT_{SAT} = f((I_{mean}/I_{mag}) * (R_{mag}/R_{mean}))$."[61]

Masimo argues that according to *Gemstar-TV Guide Int'l, Inc. v. Int'l Trade Com'n*,[62] all of the structure disclosed in the specification that is necessary to perform the claimed function forms part of the claim limitation.[63] The Federal Circuit has found that where a means-plus-function claim involves software and computers, both the computer and the software are part of the corresponding structure.[64] The '991 specification states that CPU 100 computes the oxygen saturation using "software systems [that] can accomplish the necessary calculations of the oxygen saturation level."[65] The specification then describes "one example of appropriate software [in] the flow chart shown in FIG. 7."[66] The referenced flow chart, according to Masimo, demonstrates that Filter Block 270, Threshold Peak Detector 310, Threshold Detector 32, Data Validator 280, and Saturation Processor 360 are required to calculate the claimed oxygen saturation level.

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[60] *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1087 (Fed. Cir. 2003).
[61] D.I. 140, Ex. 11 at 10:38-50.
[62] 383 F.3d 1352 (Fed. Cir. 2004).
[63] *See Gemstar*, 383 F.3d at 1361-63.
[64] *See WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1348-49 (Fed. Cir. 1999).
[65] D.I. 140, Ex. 11 at 8:32-34.
[66] *Id*. at 8:26-36.

In *Asyst Tech., Inc. v. Empak, Inc.*,[67] the Federal Circuit found that "[t]he corresponding structure to a function set forth in a means-plus-function limitation must actually perform the recited function, not merely enable the pertinent structure to operate as intended . . . ."[68] In *Asyst*, the Federal Circuit was compelled by the language of a claim limitation which recited a "second microcomputer means for receiving and processing digital information communicated with said respective second two-way communication means."[69] The court determined the function of the limitation to be receiving and processing digital information from a second two-way communication means.[70] Although the court acknowledged that a component, a communication line, enabled the second microcomputer means to perform the function, in the sense that digital information would not reach the microcomputer means without a communication line, the court found that the communication line did not actually perform either of the recited functions.[71] Similarly, in the case *sub judice*, Masimo concedes that Filter Block 270, Threshold Peak Detector 310, Threshold Detector 32, and Data Validator 280 do not conduct the calculation described; they provide the appropriate signals to Signal Processor 360.[72] Unlike *Gemstar*, in which the disputed component was "integral to performing the claimed function of the 'means ... for displaying the television schedule' limitation,"[73] the additional components here do not "comput[e] the oxygen saturation level of [blood during the] oxygen saturation monitoring interval." Rather, as in *Asyst*,

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[67] 268 F.3d 1364, 1371 (Fed. Cir. 2001).
[68] *Asyst*, 268 F.3d at 1371.
[69] *Id.*
[70] *Id*.
[71] *Id*. at 1371.
[72] D.I. 184 at 467.
[73] *Gemstar*, 383 F.3d at 1363.

the components Masimo proposes be included merely enable Signal Processor 360 to perform the claimed function. As a result, the court finds that the structure of a "computer processing means" is defined as "central processing unit 100 programmed to execute software including a saturation processor 360 utilizing a well established calculation algorithm to calculate the oxygen saturation level as follows:

$$OUT_{SAT} = f\left((I_{mean}/I_{mag}) * (R_{mag}/R_{mean})\right)$$

Where:

$$I_{mag} = I'(t_{max}) - I'(t_{min})$$
$$R_{mag} = R'(t_{max}) - R'(t_{min})$$
$$I_{mean} = [I(t_{max}) + I(t_{min})]/2$$
$$R_{mean} = [R(t_{max}) + R(t_{min})]/2.$$"

19. '991 Patent - "signal conversion means . . ." (Claim 1)

Disputed Claim Language	Masimo's Proposed Construction	Philips' Proposed Construction
"**signal conversion means** having a dynamic range extending from at least said expected minimum signal magnitude to at least said expected maximum signal magnitude so that said **signal conversion means** accommodates said first and second electrical signal and converts said first electrical signal into a first digital signal and said second electrical signal into a second digital signal"	Function: converting the first analog electrical signal into a first digital signal and converting a second, separate analog electrical signal into a second digital signal Structure: two at least 20-bit analog to digital converters 90 and 95 each having an operational range sufficient to accommodate the minimum to the maximum signal levels possible from a sensor without compensation of any kind	Function: converting said first electrical signal into a first digital signal and said second electrical signal into a second digital signal Structure: A/D converters 90, 95

The parties agree this is a means-plus-function limitation governed by 35 U.S.C.

§ 112 ¶ 6. Regarding the function of the "signal conversion means" claim, Philips stated no objection to replacing "first electrical signal" with "first analog electrical signal."[74] Masimo, in turn, stated no objection to replacing "separate" with "distinct,"[75] as implied in Philips' responsive brief.[76] As a result, the court finds that the function of the "signal conversion means" claim is "converting the first analog electrical signal into a first digital signal and converting a second, distinct analog electrical signal into a second digital signal."

Pertaining to the structure of the claim, Masimo agreed at oral argument to remove all language following "digital converters 90 and 95" from the claim.[77] The parties continue to dispute the inclusion of the "at least 20-bit" limitation. In Fig. 1 of the specification, the patentees state that both ADC 90 and ADC 95 are "20-bit" converters.[78] Later, the specification again refers to "the 20 bit analog to digital converters 90 and 95."[79] The specification, for a third time, states that "[t]he use of at least a 20 bit analog to digital converter is preferred in order to achieve the advantages possible with the instant invention."[80] A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim."[81] "A specification that merely mentions the possibility of alternative structures without specifically identifying

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[74] D.I. 184 at 475.
[75] *Id*. at 491.
[76] *See* D.I. 180 at 31.
[77] D.I. 184 at 484.
[78] D.I. 140, Ex. 11 at Fig. 1.
[79] *Id.* at 7:67-8:2 ("Low pass filters 70 and 75 function essentially as noise filters in that the 20 bit analog to digital converters 90 and 95 can, under some conditions, be sensitive to noise.").
[80] *Id*. at 8:4-7.
[81] *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

them is not sufficient to expand the scope of the claim beyond the single example used."[82] Here, the limitation outlined in the single structure disclosed by Fig. 1 and the specification cannot be expanded by the statement that at least a 20 bit converter is preferred.

Philips points to subsequent language stating that the converters are specifically designed to handle a broad range of input signals.[83] Again, the specification only mentions the possibility of alternative structures; it does not specifically identify them. For the same reasons as the "preferred" statement, this language cannot broaden the scope of the claim. Consequently, the court finds that the structure of the "signal conversion means claim" is defined as "two at least 20-bit analog to digital converters 90 and 95."

III. ORDER AND RECOMMENDED DISPOSITION

At Wilmington, this 18th day of February, 2011, having reviewed the papers submitted with the parties' proposed claim constructions, heard oral argument, and having considered all of the parties arguments (whether or not those arguments were explicitly discussed *supra*);

IT IS ORDERED, ADJUDGED, and DECREED that the disputed claim language

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[82] *Faroudja Labs., Inc. v. Dwin Electronics, Inc.*, 76 F. Supp. 2d 999, 1003, 1011-12 (N.D. Cal. 1999) (rejecting argument that general description of structure in the patent superseded more specific examples provided in the patent's illustrations, because specification did not provide alternative structures and disclosed the particular structure as the only embodiment) (citing *Fonar Corp. v. General Electric Co.*, 107 F.3d 1543, 1551 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997)); *Continental Lab. Products, Inc. v. Medax Int'l, Inc.*, 1999 WL 33116499, *14 (S.D. Cal. Aug.12, 1999) ("[W]hen the preferred embodiment is the only corresponding structure disclosed in the specification, the court will limit the means plus function element to cover the preferred embodiment and its 'equivalents thereof.'").

[83] D.I. 140, Ex. 11 at 8:7-19 (stating that the converters are "specifically designed to have a broad dynamic range, sufficient to accommodate the entire input signal from sensor 10 without compensation of any kind . . . [and that the utilization] is specifically designed knowing the minimum and maximum signal levels possible from sensor 10 and to accommodate those minimum and maximum levels.").

in asserted claims of the patents-in-suit, as identified by the parties, 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.* as follows:

Disputed Claim Term	Construction of the Court
"signal processor"	"a processing unit which determines either a secondary reference n'(t) or a primary reference s'(t) for use in a correlation canceler, such as an adaptive noise canceler"
"signal model"	"the relationship between two physiological signals which follows certain conditions"
"comparing"	"calculating point-by-point comparisons of the first and second transformed signals"
"determining"	"calculating point-by-point comparisons of the first and second transformed signals"
"calculation technique"	No Construction Necessary
"**center of mass"**	No Construction Necessary
"classifying"	No Construction Necessary
"one or more rules"	"guidelines"
"spectral domain waveform," "spectral domain dataset," and "spectral domain representation"	No Construction Necessary for "waveform," "dataset," and "representation" "spectral domain" means "frequency-related"
"selecting physiologically relevant first and second spectral values . . ."	"selecting first and second spectral values that are determined to have physiological relevance based on criteria selected in accordance with characteristics of the specific patient being monitored"

"**complex combinatorial values**"	"forming values with a magnitude component equal to $\sqrt{}$ ($\hat{S}_{Rk}^2 + \hat{S}_{IRk}^2$) and a phase component equal to ($\hat{S}_{Rk}^2 / \hat{S}_{IRk}^2$)"
"concentration"	"oxygen saturation"
"uncertain logic"	"logic that is non-binary"
"fuzzy logic"	"multivalued (as opposed to binary) logic developed to deal with imprecise or vague data. Fuzzy logic allows for partial membership in a set, values between 0 and 1, shades of gray and maybe; it introduces the concept of the 'fuzzy set'"
"reference signal having a fixed level"	"a signal produced by a reference voltage, without the use of gain compensation (i.e. feedback control circuitry) of any sort, that is not subject to variation over the entire period during which the oxygen saturation level is computed"
"having a dynamic range"	"having an operation range sufficient to accommodate the entire signal without compensation of any kind extending from a statistically possible (i.e. expected) minimum signal magnitude to a statistically possible (i.e. expected) maximum signal magnitude during an oxygen saturation monitoring interval"
"invalidating"	"indicating as not being valid"
"computer processing means"	Function: computing the oxygen saturation level of said blood during said oxygen saturation monitoring interval Structure: central processing unit 100 programmed to execute software including a saturation processor 360 utilizing a well established calculation algorithm to calculate the oxygen

	saturation level as follows: $OUT_{SAT} = f((I_{mean}/I_{mag}) * (R_{mag}/R_{mean}))$ Where: $I_{mag} = I'(t_{max}) - I'(t_{min})$ $R_{mag} = R'(t_{max}) - R'(t_{min})$ $I_{mean} = [I(t_{max}) + I(t_{min})]/2$ $R_{mean} = [R(t_{max}) + R(t_{min})]/2$
"signal conversion means"	Function: converting the first analog electrical signal into a first digital signal and converting a second distinct analog electrical signal into a second digital signal Structure: "two at least 20-bit analog to digital converters 90 and 95"

This Report and Recommendation is filed pursuant to 28 U.S.C. § 636(b)(1)(B), Fed. R. Civ. P. 72(b)(1), and D.Del.LR 72.1. The parties may serve and file specific written objections within fourteen (14) days after being served with a copy of this Report and Recommendation.[84] The objections and response to those objections are limited to ten (10) pages each.

The parties are directed to the court's standing Order in Pro Se Matters for Objections Filed under Fed. R. Civ. P. 72, dated November 16, 2009, a copy of which is available on the court's website, www.ded.uscourts.gov.

Dated: 2/18/2011

/s/ Mary Pat Thynge
UNITED STATES MAGISTRATE JUDGE

[84] FED. R. CIV. P. 72(b).