United States District Court,
D. Minnesota.

E. Neil MOORE,
Plaintiff.
v.
MEDTRONIC, INC,
Defendant.
E. Neil MOORE,
Plaintiff.
v.
GUIDANT CORPORATION and Cardiac Pacemakers, Inc,
Defendants.

Nos. Civ. 99-2066ADMBA, Civ. 01-368ADM/AJB

April 12, 2002.

Joseph R. DelMaster, and David J. Kessler, Drinker, Biddle & Reath, L.L.P., Philadelphia, PA, appeared for and on behalf of Plaintiff.

Wayne E. Willenberg, Michael J. Kane, Fish & Richardson P.C., Minneapolis, MN, Jeffrey J. Keyes, Briggs & Morgan, Minneapolis, MN, and Jonathan L. Eisenberg, Medtronic, Inc., Law Department Management, Minneapolis, MN, appeared for and on behalf of Defendant Medtronic, Inc.

Floyd R. Nation, John R. Keville, Howrey, Simon, Arnold & White, L.L.P., Houston, TX, and Charles F. Webber, Faegre & Benson, L.L.P., Minneapolis, MN, appeared for and on behalf of Defendants Guidant Corporation and Cardiac Pacemakers, Inc.

MEMORANDUM OPINION AND ORDER

MONTGOMERY**, J.**

I. INTRODUCTION

At claim construction hearings on December 10 and 11, 2001, the undersigned United States District Judge heard evidence regarding the proper interpretation of the claims of United States Patent No. 4,403,614 ("the '614 Patent") and United States Patent No. 4,375,817 ("the '817 Patent"). Although Defendant Medtronic, Inc. ("Medtronic"), and Defendants Guidant Corporation ("Guidant") and Cardiac Pacemakers, Inc. ("PCI"), are involved in two separate lawsuits with Plaintiff E. Neil Moore ("Moore"), the relevant patents and claims in dispute are identical. Therefore, all Defendants presented evidence at the same hearing, and this Order is applicable to both cases. Post-hearing briefs were submitted by the parties on January 25, 2002, and the matter was taken under advisement.

II. BACKGROUND

Both the '614 Patent and the '817 Patent are for body implantable ventricular cardioverters. Moore is a named co-inventor on both Patents assigned to Medtronic. Moore alleges that he is owed royalties by Medtronic and Guidant for each cardioverter device Defendants have manufactured and sold since 1991. While Moore disagrees, Medtronic, Guidant and PCI all contend that it is necessary for their Implantable Cardioverter/Defibrillator products to legally infringe the '614 and '817 Patents before any royalties are owed to Moore. Pl. Mem. at 1. Therefore, claim construction is necessary in preparation for a trial in which patent infringement may have to be determined.

III. DISCUSSION

A. Legal Standard

Claim construction, the interpretation of the patent claims that define the scope of a patentee's rights under a patent, is a matter of law exclusively for the court. Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-971 (Fed.Cir.1995), *aff'd* 517 U.S. 370 (1996). FN1 The language of the claims is the starting point for all claim construction analysis, as it frames and ultimately resolves all issues of claim interpretation. Robotic Vision Sys., Inc. v. View Eng'g. Inc., 189 F.3d 1370, 1375 (Fed.Cir.1999); Abtox, Inc. v. Exitron Corp., 122 F.3d 1019, 1023 (Fed.Cir.1997). Claims must be read in view of the specification of which they are a part. Markman, 52 F.3d at 979. The description of the invention given in the specification may serve as a dictionary to define terms used in the claims. *Id*. A patentee acting as his own lexicographer FN2 must clearly define any special definitions in the specification.FN3 *Id*. at 980. A court should also consider the patent's prosecution history, as it is "of primary significance in understanding the claims." *Id*. Prosecution history should be used to understand the language in the claims, but not to enlarge, diminish or vary the limitations in the claims. *Id* .

FN1. Federal Circuit decisions on claim construction have "national *stare decisis* effect." Key Pharms. v. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed.Cir.1998).

FN2. While patentees can define terms of a claim contrary to their ordinary meaning, "nothing in any precedent permits judicial redrafting of claims." Becton Dickinson and Co. v. C.R. Bard, Inc ., 922 F.2d 792, 799 (Fed.Cir.1990); Process Control Corp. v. HydReclaim Corp., 190 F.3d 1350, 1357 (Fed.Cir.1999).

FN3. A court should generally not use non-scientific dictionaries for defining technical words, as general usage dictionaries may fail to provide satisfactory constructions of technical claim terms in dispute. AFG Indus., Inc. v. Cardinal IG Co., 239 F.3d 1239, 1247-1248 (Fed.Cir.2001).

Claims speak to those skilled in the art. Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1376 (Fed.Cir.2001); Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 1054 (Fed.Cir.1994). When the meaning of words in a claim is disputed, the specification and prosecution history can provide relevant information about the scope and meaning of the claim. Electro, 34 F.3d at 1054. However, "claims are not to be interpreted by adding limitations appearing *only in* the specification." *Id*. (emphasis added); Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 865 (Fed.Cir.1989) ("References to a preferred

embodiment [in a specification] are not claim limitations."). Particular embodiments appearing in a specification are not read into claims if the claim language is broader than the embodiment. *Id*. Therefore, a specification must *require* a limitation in order to read the limitation into the claims. *Id*. "If everything in the specification were required to be read into the claims, or if structural claims were to be limited to devices operated precisely as a specification-described embodiment is operated, there would be no need for claims." SRI Int'l v. Matsushita Electric Corp. of America, 775 F.2d 1107, 1121 (Fed.Cir.1985). "It is the *claims* that measure the invention." *Id*. (emphasis in original).

B. Disputed Claims

The claim language the parties dispute is:

(1) "Means for detecting the onset of a malignant ventricular tachyarrhythmia," '614 Patent, claims 1, 9; '817 Patent, claim 1,

(2) "Means responsive to the detecting means for providing a cardioverting signal," '614 Patent, claims 1, 9; '817 Patent, claim 1,

(3) "Means for detecting a predetermined progression of said malignant ventricular tachyarrhythmia," '817 Patent, claim 1,

(4) "Detecting the onset of a malignant ventricular tachyarrhythmia, " '614 Patent, claim 16, and

(5) "Delivering, in response thereto, a cardioverting signal having an energy level that is high relative to a typical pacing threshold of 50 microjoules and below 45 joules that is typically necessary for defibrillation." '614 Patent, claim 16.

Moore Mem. at 9-10; Medtronic Reply Mem. at 1. Each claim element will be analyzed in turn.

1. Means for Detecting the Onset of a Malignant Ventricular Tachyarrhythmia

This claim element is expressed in means-plus-function terminology and is therefore interpreted under 35 U.S.C. s. 112 para. 6:

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.

35 U.S.C. s. 112 para. 6 (2001). Claim construction of a s. 112 para. 6 limitation, referred to as a means-plus-function limitation, requires (1) identification of the claimed function and (2) identification of the corresponding structure in the specification which performs the recited function. IMS Tech., Inc. v. Haas Automation, Inc., 206 F.3d 1422, 1429-1430; Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1257 (Fed.Cir.1999). These identifications are both questions of law, while whether an accused device performs the identical function "or an equivalent thereof" is a question of fact. IMS, 206 F.3d at 1430. A means-plus-function claim encompasses all structure in the specification corresponding to that element and equivalent structures. Micro Chem., 194 F.3d at 1258. The scope of the claim is not expanded by s. 112 para. 6; rather, s. 112 para. 6 "operates to *cut back* on the types of *means* which could literally satisfy the

claim language." Johnston v. IVAC Corp., 885 F.2d 1574, 1580 (Fed.Cir.1989) (emphasis in original) (holding that s. 112 para. 6 "restricts the scope of the literal claim language"). However, means-plus-function claims are not limited to a particular means set forth in the specification, because they are construed to cover equivalents as well. D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574 (Fed.Cir.1985).

a. The Function

The recited function in this claim element is to detect the onset of malignant ventricular tachyarrhythmia ("MVT"). Central to the dispute is how to properly construe the term "onset," which will largely determine the scope of this claim.

The interpretation for a term can ultimately be determined and confirmed only with "a full understanding of what the inventors actually invented and intended to envelop with the claim." Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1250 (Fed.Cir.1998). "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." Id. A claim construction does not become persuasive by following a certain rule, but by defining terms in the context of the whole patent. Id. The intrinsic evidence of record (the claims, the specification, and the prosecution history) is the most significant source of the legally operative meaning of disputed claim language, and in most situations will resolve any ambiguity in a disputed claim term. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). In such circumstances, "it is improper to rely on extrinsic evidence." Id. However, " *onics* does not prohibit courts from examining extrinsic evidence, even when the patent document is itself clear." Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1308 (1999). "Rather, *Vitronics* merely warned courts not to *rely* on extrinsic evidence ... to contradict the meaning of claims discernable from ... the intrinsic evidence." Id. (emphasis in original); Key Pharms. v. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed.Cir.1998) (disapproving of using extrinsic evidence to arrive at a claim construction "clearly at odds with" the claim construction mandated by the intrinsic evidence).

Thus, while "reliance" on extrinsic evidence is only proper when claim language remains genuinely ambiguous after consideration of the intrinsic evidence, it is "entirely appropriate, perhaps even preferable, for a court to consult trustworthy extrinsic evidence to ensure that the claim construction ... is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field." Pitney Bowes, 182 F.3d at 1308; Key Pharms., 161 F.3d at 716 ("[T]rial courts generally can hear expert testimony for background and education on the technology implicated by the presented claim construction issues...."). This is particularly appropriate to align the court's understanding of the technical aspects of the patent with the understanding of one skilled in the art. Pitney Bowes, 182 F.3d at 1308; U.S. Industrial Chems. v. Carbide & Carbon Chems. Corp., 315 U.S. 668, 678 (1942). However, "if the meaning of a disputed claim term is clear from the intrinsic evidence ... it cannot be altered or superseded by witness testimony or other external sources simply because one of the parties wishes it were otherwise." Key Pharms., 161 F.3d at 716. The role of extrinsic evidence is to enhance the court's understanding of the patent language, not to vary or contradict the terms of the claims. Markman, 52 F.3d at 981.

The specification of both patents defines the term ventricular tachyarrhythmia to include premature ventricular contraction, ventricular tachycardia and ventricular fibrillation, inclusively. '614, col. 1: 45-48. FN4 At the hearing, Dr. Morton M. Mower, M.D., testified regarding the relevant background information to understand the operation of the human heart. The time between depolarization of the heart's ventricles

(which precedes the ventricles' contraction and pumping of blood) is called an R-R interval, expressed in seconds or milliseconds. Markman Hearing Transcript Day I ("Tr.I") at 30 ln. 6-31 ln. 8. An R-R interval of one second corresponds to a heart rate of 60 beats per minute, for example. *Id*. A single premature ventricular beat is called a premature ventricular contraction ("PVC"). Two premature heartbeats in a row is called a couplet. Three or more rapid heartbeats in a row are a tachycardia. The term tachyarrhythmia is a general term encompassing PVCs, couplets, tachycardias, and also ventricular fibrillations, which are multiple premature heartbeats too fast to count. *Id*. at 32 ln. 19-36 ln. 16.

FN4. The '614 and '817 Patents contain identical specifications, therefore references to language found in either Patent are applicable to both. As such, citations will only be made to the '614 Patent regarding claims impacting both Patents.

The '614 Patent explains that self-reversing tachyarrhythmias are referred to in the specification as benign, while tachyarrhythmias that culminate in fibrillation are referred to as "malignant." '614, col. 1: 52-55. Tachyarrhythmias are defined to include PVCs, thus some PVCs are benign, while other PVCs can culminate in fibrillation.FN5

FN5. Because the specification defines benign as self-reversing, and malignant as capable of culminating in fibrillation (or non-self reversing), a confusion arises. Logic would appear to require that some PVCs are *not* self-reversing, namely, those PVCs that are malignant, or representing an R-R interval at or below 430 msecs. This apparent conclusion follows because if *all* PVCs were necessarily self-reversing (benign), then the invention could not respond to all PVCs because, by definition, it *only* responds to "malignant" (non-self reversing) ventricular tachyarrhythmias. However, Robert Arzbaecher, Ph.D., testified that "[t]here is no such thing as a non-reversing PVC.... [A] PVC is by definition self-reversing. It's a single event." Tr. II at 49 lns. 14, 17-18. Dr. Mower concurred that "[a] PVC is a single beat." Tr. I at 34 lns. 1-2. Because the invention *does* necessarily respond specifically to PVCs, the definition of "malignant" explicated in the specification suggests that those PVCs must be non-self reversing. Arzbaecher explained: "[This] definition is not consistent internally. You can't talk about non-self reversing and PVC together. That's inconsistent." Tr. II at 48 lns. 15-17. Arzbaecher further explained that "non-self reversing really means sustained." Tr. II at 48 ln. 14, 49 lns. 23-24. This is in accord with the understanding that a malignant tachyarrhythmia is one that is sustained and thereby culminates in fibrillation. '614, col. 1: 52-55. Because PVCs cannot be sustained, they likewise cannot be "malignant" under the specified definition. The detection of the "onset" of a malignant, or sustained, condition, thus can occur with the detection of a PVC with an R-R interval at or below 430 msecs., while the PVC, being a single heartbeat by definition, is not *itself* "sustained" or "non-self reversing." A sufficiently short PVC properly represents the "onset" of a MVT, but not the "malignant" sustained condition that is intended to be prevented by the invention.

The specification teaches how the inventors purported to determine which tachyarrhythmias are malignant. The specification explains that from the studies done, the inventors "believe that an R-R interval greater than 430 msecs. is benign and that the onset of a malignant tachyarrhythmia can be detected as the R-R interval approaches 430 msecs." '614, col. 2: 5-9.

The inventors specifically distinguish between the "onset of a malignant tachyarrhythmia" and the "onset of fibrillation," and explain that prior art devices responded to the onset of either condition with a defibrillation energy level stimulating signal. '614, col. 2: 13-18. The novelty of the '614 Patent is described by the

inventors as the ability to cardiovert a MVT prior to the onset of fibrillation with a signal to the heart at an energy level significantly below that required for defibrillation. This signal is delivered "immediately on or shortly after the onset of the tachyarrhythmia and prior to the onset of fibrillation." '614, col. 2: 18-30. The abstract to both Patents describes the detection of the onset of a MVT as being "before the onset of fibrillation."

The inventors conducted studies with acute, open-chested, pentobarbital anesthetized mongrel dogs to determine that less energy was necessary for cardioversion after fibrillation was induced when the signal was delivered at the onset of fibrillation as opposed to subsequently delivered signals. Id. at col. 2: 43-66. Therefore, the '614 and '817 Patent inventions were designed to detect the "onset of a malignant ventricular tachyarrhythmia" in human hearts so as to prevent the onset of fibrillation by delivering, at an earlier time, a lower-energy signal than that required for defibrillation. Id. at col 3: 11-27.

b. The Structure

The corresponding structure in the specification is the circuit of Figure 1. The preferred embodiment identified in the specification describes detecting circuitry that is responsive to "the first malignant ventricular tachyarrhythmic event." Id. at col. 3: 36-37. The circuit of Figure 1 illustrated in the specifications is comprised of an R-wave sense amplifier (10), a one shot (11), and an AND gate (12) that is connected to a stimulator (13). '614, col. 4: 16-22.

Because "an R-R interval of 430 msecs. or less indicates a malignant ventricular tachyarrhythmia," the one shot is a negative edge retriggerable device having a period of 430 msecs. Id. at col. 4: 28-29, 39-40. The specification teaches that "the onset of a MVT and, specifically, the first malignant ventricular tachyarrhythmic event" is represented by the output of AND gate 12 going high after previously having been low. Id. at col. 4: 45-48. Thus, the onset of a MVT is identified in the specification as that which causes the AND gate output to go high. In accordance with the circuitry structure, the occurrence of a single R-R interval of 430 msecs. or less results in two high inputs *into* the AND gate, and correspondingly a high output *from* the AND gate. Id. at col. 4: 40-44. Therefore, the occurrence of a single R-R interval of 430 msecs. or less constitutes the onset of a MVT. This construction is wholly consistent with the definition in the specification setting forth that the onset of a "malignant" ventricular tachyarrhythmia occurs with the detection of an R-R interval approaching 430 msecs. Id. at col. 2: 5-9.

As the specification demonstrates, the circuitry illustrated in the Patents requires responsiveness to any sufficiently short PVC. Thus, the specification requires a limitation that the device respond to the first, single, short PVC. This limitation is incorporated into the definition of "onset" of a "malignant" ventricular tachyarrhythmia as contained in the '614 Patent, claims 1 and 9, and the '817 Patent, claim 1.

The specification explains that the inventors' studies indicate that a ventricular tachyarrhythmia ("VT") is malignant when the R-R interval approaches 430 msecs. in duration, but foresees that "[o]ther parameters may be employed to establish the onset of a MVT and its progression." '614, col. 8: 57-59. Thus, the Patents do not require that 430 msecs. be the specific R-R interval duration necessarily representative of the onset of a MVT. The inventors explain that "[i]t is therefore to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described," and they note possible modifications and variations such as combining the invention with a pacemaker, or configuring for multiple increases in the energy level of the cardioverting signal delivered. Id. at col. 8: 47-67. However, the limitation to the scope of the appended claims imports the limitation to detection of the "onset" of a MVT,

which, as explained above, is limited to the detection of the "first malignant tachyarrhythmic event," namely the first short PVC.

The proper interpretation of this claim element is: The circuit of Figure 1, which detects the first malignant ventricular tachyarrhythmic event by detecting the first R-R interval that is equal to or less than approximately 430 msecs. in duration.

c. Moore's Claim Differentiation Argument

Moore asserts that because dependent claims 2, 5, 7 and 14 of the '614 Patent specifically include language limiting them to means "responsive to the first malignant ventricular tachyarrhythmic event," while independent claims 1 and 9 do not, the doctrine of claim differentiation dictates the limitation cannot be read into claims 1 or 9.

Under the doctrine of claim differentiation, it is presumed that different words used in different claims result in a difference in meaning and scope for each of the claims. Clearstream Wastewater Sys., Inc. v. Hydro-Action, Inc., 206 F.3d 1440, 1446 (Fed.Cir.2000). Claim differentiation applies where a court interprets the scope of two different claims to be identical by importing the limitations of the dependent claim into the independent claim. Globetrotter Software, Inc. v. Elan Computer Group, Inc., 236 F.3d 1363, 1369 (Fed.Cir.2001). This doctrine cannot broaden a claim beyond what is contained in the written description, but it prevents the narrowing of broad claims by reading into them the limitations of narrower claims.FN6 Clearstream, 206 F.3d at 1446; D.M.I., 755 F.2d at 1574 ("Where some claims are broad and others are narrow, the narrow claim limitations cannot be read into the broad whether to avoid invalidity or to escape infringement ."). "Claim differentiation is a [judicially developed] guide, not a rigid rule." FN7 Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538 (Fed.Cir.1991). A means-plus-function limitation "is not made open-ended by the presence of another claim specifically claiming the disclosed structure which underlies the means clause or an equivalent of that structure." *Id*.

FN6. "It is settled law ... that independent claims containing means-plus-function limitations do not have the same literal scope as dependent claims reciting specifically the structure that performs the stated function." Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc., 248 F.3d 1303, 1313 (Fed.Cir.2001). What matters is the conviction one skilled in the art would have as to what is disclosed after reading the specification. Id. at 1312.

FN7. *But see* D.M.I., 755 F.2d at 1574 (stating the doctrine of claim differentiation is a "well established" and "fixed" rule that "enjoys an immutable and universally applicable status comparatively rare among rules of law," and that without it "the entire statutory and regulatory structure governing the drafting, submission, examination, allowance, and enforceability of claims would crumble").

In the instant case, the limitation of responding to the first short PVC, or the "onset" of a MVT, derives from the requirements of the circuitry described in the specification and the articulated function of the invention, not from the dependent claims. Where a limitation that is read into a claim derives from the specification rather than from a dependent claim, the doctrine of claim differentiation is not violated. Laitram, 939 F.2d at 1538. It is the claims of the patent, not its specifications, that measure the invention. SRI Int'l, 775 F.2d at 1122. While patent claims may incorporate the specifications by reference and thus

limit the patent to the form described in the specification, "it is not necessary to embrace in the claims or describe in the specifications all possible forms in which the claimed principle may be reduced to practice." *Id*. The claims at issue do not so incorporate the specification by reference so as to limit them beyond the necessary requirements inherent in the structure of the circuity described.

Extraneous limitations or embodiments appearing in the specification will not be read into the claims. Enercon v. International Trade Comm'n, 151 F.3d 1376, 1384 (Fed.Cir.1998). "Extraneous" means a limitation read into a claim from the specification "wholly apart from" any need to interpret what the patentee meant by particular words in the claim. E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed.Cir.1988). However, if a specification "requires" a limitation, that limitation should be read from the specification into the claims. *Id*. A specification that merely mentions the possibility of alternate structures without specifically identifying them is not sufficient to expand the scope of the claim beyond the example used. *See* Fonar Corp. v. General Elec. Co., 107 F.3d 1543, 1551 (Fed.Cir.1997); *accord* Faroudja Labs., Inc. v. Dwin Elecs., Inc., 76 F.Supp.2d 999, 1003 (N.D.Cal.1999). As explained above, the circuitry illustrated in the Patents requires responsiveness to any sufficiently short PVC. Thus, the specification requires a limitation that the device respond to the first, single, short PVC. This limitation is not "wholly apart from" the need to interpret what the patentee meant by the particular words in the disputed claims. Therefore, this limitation is properly read as a part of the definition of the "onset" of a "malignant" ventricular tachyarrhythmia as contained in the language of the '614 Patent, claims 1 and 9, and the '817 Patent, claim 1. No violation of the doctrine of claim differentiation is implicated.

2. Means Responsive to the Detecting Means for Providing a Cardioverting Signal

This claim element is also stated in means-plus-function language and will be interpreted under 35 U.S.C. s. 112 para. 6.

a. The Function

The function of this claim element is to deliver a cardioverting signal to the heart in response to the invention's "onset" detection.

b. The Structure

The corresponding structure disclosed in the Patent specifications is stimulator 13 of the circuit of Figure 1, two embodiments of which are shown in Figures 2 and 3, including the stimulators of the circuits of Figures 4 and 5 (Figures 2-5 are not reproduced here). The specification requires that the cardioverting signal from stimulator 13 must be delivered "immediately on or shortly after the onset of the tachyarrhythmia and prior to the onset of fibrillation." '614, col. 2: 26-30. That is, "the detecting circuitry is responsive to the first malignant ventricular tachyarrhythmic event to result in the delivery of the cardioverting signal." Id. at col. 3: 35-38.

The proper interpretation of this claim element is: Stimulator 13 of the circuit of Figure 1, two embodiments of which are shown in Figures 2 and 3, which delivers a cardioverting level signal immediately on or shortly after the detection of the onset of a MVT. The corresponding circuit also includes the stimulators shown in Figures 4 and 5.

3. Means for Detecting a Predetermined Progression of Said Malignant Ventricular Tachyarrhythmia

Again, the means-plus-function expression requires interpretation under 35 U.S.C. s. 112 para. 6.

a. The Function

The function of this claim element is to detect a predetermined progression of a MVT toward or to fibrillation.

b. The Structure

The corresponding structure disclosed in the Patent specifications is the circuit of Figure 4 of the '817 Patent, comprised of an R-wave sense amplifier (10), a pair of negative edge retriggerable one shots (30, 31) that when triggered produce, respectively, 430 msec. and 200 msec. signals, and AND gates (33, 34) that receive the output signals of both the sense amplifier and the one shots.

The specification articulates that the inventors believed "an R-R interval approaching 200 msecs. indicates the onset of fibrillation." '817, col. 2: 9-11. Separate and distinguishable is their premise that "the onset of a malignant tachyarrhythmia can be detected as the R-R interval approaches 430 msecs." Id. at col. 2: 5-9. The progression of the R-R intervals from less than 430 msecs. but more than 200 msecs., to subsequently 200 msecs. or less, is described in the specification as the malignant tachyarrhythmia "progress [ing] toward or to fibrillation." Id. at col. 6: 39-40. As the R-R interval decreases and this progression is detected by the circuit, "the energy level of the cardioverting signal is increased." Id. at col. 6: 40-41.

The proper interpretation of this claim element is: The circuit of Figure 4, which detects a predetermined progression of a MVT toward or to fibrillation by detecting a MVT characterized by an R-R interval of less than approximately 200 msecs. and distinguishing it from an MVT with an R-R interval of more than 200 but less than 430 msecs.

4. Detecting the Onset of a Malignant Ventricular Tachyarrhythmia

The independent method claim 16 of the '614 Patent describes the "method of cardioverting [MVTs] which comprises" two identified functions, of which this claim element is the first. Therefore, as a step-plus-function claim element, this language is interpreted under 35 U.S.C. s. 112 para. 6.

a. The Function

As explained Parts III(B)(1)(a)-(b), the function described is to detect the first R-R interval that is equal to or less than approximately 430 msecs. in duration.

b. The Structure

As explained in Part III(B)(1)(b), the corresponding structure is the circuit of Figure 1, comprised of an R-wave sense amplifier (10), a one shot (11), and an AND gate (12) that is connected to a simulator (13).

The proper interpretation of this claim element is: To detect the first malignant ventricular tachyarrhythmic event by detecting the first R-R interval that is equal to or less than approximately 430 msecs. in duration.

5. Delivering, in Response Thereto, a Cardioverting Signal Having an Energy Level that is High Relative to a Typical Pacing Threshold of 50 Microjoules and Below 45 Joules that is Typically

Necessary for Defibrillation

The independent method claim 16 of the '614 Patent describes the "method of cardioverting [MVTs] which comprises" two identified functions, of which this claim element is the second. As a step-plus-function claim element, this language is interpreted under 35 U.S.C. s. 112 para. 6.

a. The Function

The function is to deliver a cardioverting signal of the specified energy level range in response to the prior step of detecting the first malignant ventricular tachyarrhythmic event by detecting the first R-R interval that is equal to or less than approximately 430 msecs. in duration.

b. The Structure

The structure employed is stimulator 13 of Figure 1, details of which are shown in Figures 2 and 3.

The proper interpretation of this claim element is: To deliver a cardioverting signal of the specified energy level range immediately on or shortly after the detection of the onset of a MVT.

IV. CONCLUSION

Based on the foregoing, and all the files, records and proceedings herein, IT IS HEREBY ORDERED that the claim constructions of the '614 and '817 Patents are construed as set forth in this Order.

D.Minn.,2002.
Moore v. Medtronic, Inc.