United States District Court,
E.D. Tennessee.

RADIO SYSTEMS CORPORATION,
Plaintiff.
v.
TRI-TRONICS, INC,
Defendant.

No. 3:05-CV-243

Dec. 11, 2006.

Morgan L. Fitch, IV, R. Bradford Brittian, Robert E. Pitts, Pitts and Brittian P.C., Knoxville, TN, for Plaintiff.

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REPORT AND RECOMMENDATION

C. CLIFFORD SHIRLEY, JR.**, United States Magistrate Judge.**

This matter is before the undersigned pursuant to 28 U.S.C. s. 636(b), the Rules of this Court, and by Order FN1 [Doc. 19] of the Honorable Thomas A. Varlan, United States District Judge, for a report and recommendation on the construction of the claims at issue in this case pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

FN1. This matter was initially referred to Magistrate Judge H. Bruce Guyton for a report and recommendation on February 8, 2006. However, on February 16, 2006, Chief Judge Curtis L. Collier designated the undersigned as the United States Magistrate Judge in this case. [Doc. 21].

This is an action for a declaratory judgment brought by the plaintiff Radio Systems Corporation ("Radio Systems") against the defendant Tri-Tronics, Inc. ("Tri-Tronics"). Both the plaintiff and defendant sell pet training products, including portable dog training transmitters, in the State of Tennessee. In its complaint, Radio Systems seeks a declaratory judgment finding (1) that U.S. Patent No. D446,144 ("the '144 Design Patent" or "the '144 Patent"), U.S. Patent No. 4,802,482 ("the '482 Patent"), and U.S. Patent No. 5,193,484 ("the '484 Patent") are not infringed by Radio Systems, and (2) that the '482 Patent and the '484 Patent are invalid and/or unenforceable. [Doc. 61]. Tri-Tronics asserts claims of patent infringement with respect to each of the subject patents in its counterclaim [Doc. 5].

The parties submitted Joint Claim Construction Statements with respect to each of the patents at issue

[Docs. 24, 26, 28]. The undersigned conducted a *Markman* hearing on April 10, 2006.

I. THE '144 DESIGN PATENT

The '144 Design Patent claims the ornamental design of a "Portable Dog-Training Transmitter/Holster Assembly" as shown and described by seven illustrations, namely: a front perspective view of the portable transmitter/holster assembly (Fig.1); a front elevational view of the assembly (Fig.2); a rear elevational view thereof, the dashed lines illustrating a belt clip which forms part of the environment in which the portable transmitter/holster assembly is utilized (Fig.3); a top plan view thereof (Fig.4); a bottom plan view thereof (Fig.5); a left side elevational view thereof (Fig.6); and a right side elevational view thereof (Fig.7) .FN2 [Doc. 24 Ex. A].

FN2. Copies of these illustrations are attached hereto as Appendix A.

"A design patent protects the non-functional aspects of an ornamental design as shown in a patent." KeyStone Retaining Wall Systems, Inc. v. Westrock, Inc., 997 F.2d 1444, 1450 (Fed.Cir.1993). As with a utility patent, determining whether a design patent claim has been infringed first requires a proper construction of the claim in order to determine its meaning and scope. Elmer v. ICC Fabricating, Inc., 67 F.3d 1571, 1577 (Fed.Cir.1995). Unlike a utility patent, however, a design patent does not usually contain a written description of the design:

The title of the design must designate the particular article. No description, other than a reference to the drawing, is ordinarily required. The claim shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described. More than one claim is neither required nor permitted.

37 C.F.R. s. 1.153(a). "The requirement that the court construe disputed claim language, as applied to design patents, must be adapted to the practice that a patented design is claimed as shown in its drawing." Goodyear Tire & Rubber Co. v. Hercules Tire & Rubber Co., 162 F.3d 1113, 1116 (Fed.Cir.1998). Generally, the claim "is limited to what is shown in the application drawings." In re Mann, 861 F.2d 1581, 1582 (Fed.Cir.1988). "Design patents have almost no scope." *Id*. "[I]t is the appearance of a design as a whole which is controlling in determining questions of patentability and infringement." KeyStone, 997 F.2d at 1450 (quoting *In re Rubinfield,* 270 F.3d 391, 395 (C.C.P.A.1959)).

In the Joint Construction Statement [Doc. 24], the parties raised the issue of whether certain features of the design should be excluded from the scope of the claim because these features are functional and not purely ornamental. At the *Markman* hearing, Tri-Tronics advised the Court that it was not asking the Court to ignore certain features on the basis of functionality. The Court will therefore deem this issue waived and will not address it further. The parties also raised the issue of novelty in the Joint Construction Statement. However, both parties have agreed to defer the determination of the points of novelty for the claimed design until after the *Markman* hearing.

Accordingly, the only issue remaining is whether Radio Systems is correct in its assertion that the shaded areas of the design patent drawings indicate a "webbing" material. Tri-Tronics argues that Radio Systems's assertion is wholly unsupported. Specifically, Tri-Tronics contends that the prosecution history for the '144 Design Patent never characterizes such shading as designating any particular type of material. Moreover,

Tri-Tronics argues, neither the Patent Office Rules (37 C.F.R. s.s. 1.1, et seq.) nor the Manual of Patent Examining Procedure ("MPEP") specify that any particular form of shading designates webbing.

Radio Systems argues, on the other hand, that the cross-hatch markings in the patent design drawings indicate that the holster is made of a material, either webbed or woven, that is different from the material used to make the rest of the holster/transmitter assembly. In support of this assertion, Radio System relies upon the United States Patent and Trademark Office's ("PTO") Guide for Preparation of Patent Drawings, June 2002 [Ex. 1] and "Drawing Examples" taken from the PTO's website on April 6, 2006 [Ex. 2].

The Court has reviewed the various sources cited by the parties and notes that these sources all refer to the same charts of symbols adopted by the PTO for use in patent drawings. However, there are no symbols in these charts that are designated to represent "webbing," nor do these charts reference the type of cross-hatch markings used in the drawings at issue or otherwise indicate that such cross-hatch markings designate any particular kind of material.

The Court notes that the cross-hatch markings in the drawings at issue are in areas which appear to be curved. The Patent Office Rules provide that shading may be used "to indicate the surface or shape of spherical, cylindrical, and conical elements of an object." 37 C.F.R. s. 1.84(m); MPEP s. 608.02(m). Accordingly, the Court concludes that the cross-hatch markings are simply shading to indicate curved elements of the invention (such as rounded corners and piping) and do not purport to designate the use of any particular type of material, such as webbing.

Based upon the Court's review of the patent drawings, it is **RECOMMENDED** that the '144 Design Patent be construed to contain the following limitations:

Figure 2FN3

FN3. Figure 1 is a perspective view of the design and is less helpful in defining the claimed invention than the elevational and plan views illustrated in Figures 2-7. Accordingly, the Court will not attempt to construe Figure 1.

Figure 2 illustrates a front elevation view of the ornamental design of the ' 144 Patent. It depicts a holster, which defines generally a rectangular front profile with a substantially linear left edge which extends downwardly to transition into a rounded lower left hand corner which transitions into a substantially shorter lower edge portion. The lower edge portion transitions into a right hand corner which, in turn, transitions into a right edge which extends upwardly in substantially a straight line. The upper portion of the holster includes a left hand flap that angles slightly upward and appears to overlap a right hand flap. The holster also defines a window generally disposed in the upper right hand portion of the rectangular holster, the window defining an irregular curvilinear border along a portion of the top of the window and along the left and bottom sides of the window, and defines a linear border along the right side of the window and along a portion of the top border of the window. Piping is affixed around the borders of the window and extends through the left hand flap.

A portion of a transmitter housing is visible through the window in the holster, the housing portion defining a linear upper edge portion transitioning into a rounded upper right hand corner which, in turn, transitions into a downwardly extending linear side portion which is substantially at a right angle to the upper edge

portion. The transmitter housing face appears to have a surface detail of some kind that roughly mimics the irregular curvilinear border of the window of the holster. Further, the housing has a first round button, or knob, disposed at the upper right hand corner of the housing, which button appears to have a ribbed perimeter. A small round "feature" is illustrated slightly below and to the left of the first round button. Also, below and slightly to the left of the small round feature, second and third round buttons are located with the second round button being immediately above the third round button.

An antenna extends upwardly on the left hand side of the assembly behind the left hand flap of the holster. The antenna defines a base portion having two sections which differ in diameter, and a tubular body extending therefrom having an even smaller diameter. At the distal end of the tubular body is a tip portion defining a diameter larger than the tubular body and having a rounded top. At the bottom of the holster, a rounded structure extends below the bottom edge of the holster.

Figure 3

Figure 3 depicts a rear elevation of the assembly. The holster is depicted as having the same substantially rectangular shape as described with respect to Figure 2, but with no window. However, the holster is depicted as defining an opening through which the antenna extends, with this opening being bordered by piping. Further, a substantially rectangular structure is disposed on the back surface of the holster toward the upper portion of the holster substantially equidistant from the left and right edges. Centrally disposed in this rectangular structure is a round feature. It is also noted that a portion of the piping which defined the border of the window of the holster is visible from this rear elevation view.FN4

FN4. There is a belt clip shown in phantom lines in Figure 3 and in Figures 4-7. Because the belt clip is shown in phantom lines, it is not considered a part of the patented design. *See, e.g.,* Elmer, 67 F.3d at 1577 (noting that because certain features were not omitted from patent application drawings, these features "effectively limited the scope of [the] patent claim").

Figure 4

Figure 4 is a top plan view of the design of the '144 Patent. This view reflects that the holster roughly defines a rectangular shape with rounded corners, and reflects that the left hand flap defines an irregular shape which extends over the top of the transmitter housing. Further, the opening through which the antenna extends is irregular in shape, and the window of the holster angles rearward to expose a forward top surface portion of the transmitter housing at the upper right corner of such housing. The first button on the transmitter has a ribbed edge and is raised from the surface of the housing. The rectangular structure on the rear of the holster is depicted as being raised from the surface of the holster, and the round structure mounted on the rectangular structure is depicted as a raised stud member having a head portion defining an increased diameter.

Figure 5

Figure 5 is a bottom plan view of the design of the '144 Patent. This view reflects that the holster roughly defines a rectangular shape with rounded corners, and reflects that the rounded structure at the bottom of the holster is elongated and oriented laterally across the bottom of the holster. The rectangular structure on the rear of the holster is depicted as being raised from the surface of the holster, and the round structure mounted on the rectangular structure is depicted as a raised stud member having a head portion defining an

increased diameter.

Figure 6

Figure 6 is a left side elevation view of the design of the '144 Patent. This figure discloses that the back of the holster extends downwardly in substantially a straight line which transitions into a rounded corner that, in turn, transitions into a flat bottom. The flat bottom transitions into a rounded corner and a straight front portion which extends approximately half way up the front of the holster at which point the piping which surrounds the window gradually curves inward and then outward. In this view the left hand flap can be seen to angle upward and rearward over the top of the transmitter housing, and defines the opening through which the antenna extends cooperatively with side and back portions of the holster.

The rectangular structure on the rear of the holster is depicted as being raised from the surface of the holster, and the round structure mounted on the rectangular structure is depicted as a raised stud member having a head portion defining an increased diameter. The rounded structure at the bottom of the holster is depicted as being substantially rectilinear in shape.

Figure 7

Figure 7 is a right side elevation view of the design of the '144 Patent. This figure discloses that the back of the holster extends downwardly in substantially a straight line which transitions into a rounded corner that, in turn, transitions into a flat bottom. The flat bottom transitions into a rounded corner and a straight front portion which extends approximately half way up the front of the holster at which point the piping which surrounds the window gradually angles upward and rearward to expose a portion of the transmitter housing. In this view the left hand flap can be seen to angle upward and rearward over the top of the transmitter housing.

The rectangular structure on the rear of the holster is depicted as being raised from the surface of the holster, and the round structure mounted on the rectangular structure is depicted as a raised stud member having a head portion defining an increased diameter. The rounded structure at the bottom of the holster is depicted as being substantially rectilinear in shape.

II. THE '482 PATENT

The '482 Patent claims a "Method and Apparatus for Remote Control of Animal Training Stimulus."

A. ***Applicable Law***

The Court begins its claim construction analysis with the intrinsic evidence set forth in the record:

It is well-settled that, in interpreting the asserted claim, the court should look first to the intrinsic evidence of record, *i.e.,* the patent itself, including the claims, the specification and, if in evidence, the prosecution history. Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.

Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996) (citation omitted). "All intrinsic evidence is not equal however." Interactive Gift Express, Inc. v. CompuServe Inc. ., 256 F.3d 1323, 1331 (Fed.Cir.2001). In examining the intrinsic evidence, the Court must first "look first to the claim language

itself to define the scope of the patented invention." Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1267 (Fed.Cir.2001).

Second, the Court must examine the specification. *See* Vitronics, 90 F.3d at 1582. A patentee is "not required to describe in the specification every conceivable and possible future embodiment of his invention." Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1344 (Fed.Cir.2001). Thus, in examining the written description, the Court must avoid importing limitations from the specifications into the claims. "[I]f the meaning of the words themselves would not have been understood to persons of skill in the art to be limited only to the examples or embodiments described in the specification, reading the words in such a confined way would mandate the wrong result and would violate our proscription of not reading limitations from the specification into the claims." Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1205 (Fed.Cir.2002).

Finally, the Court should "examine the prosecution history to determine whether the patentee has relinquished a potential claim construction in an amendment to the claim or in an argument to overcome or distinguish a reference." Bell Atlantic, 262 F.3d at 1268. If during the prosecution of the patent the patentee has disclaimed a particular interpretation, provided an explicit definition or otherwise taken a position to distinguish prior art, such statements are relevant to determining the meaning of the terms in the patent claims. Southwall Technologies, Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed.Cir.1995).

In construing claims, courts may under some circumstances rely upon extrinsic evidence. Extrinsic evidence is evidence which is "external to the patent and file history," such as expert testimony, inventor testimony, and prior art. Vitronics, 90 F.3d at 1584. If the intrinsic evidence is unambiguous, the Court may not rely upon extrinsic evidence for the purposes of claim construction. Bell & Howell Document Mgmt. Prods. Co. v. Altek Systems, 132 F.3d 701, 706 (Fed.Cir.1997). As the Federal Circuit explained in *Vitronics:*

The claims, specification, and file history, rather than extrinsic evidence, constitute the public record of the patentee's claim, a record on which the public is entitled to rely. In other words, competitors are entitled to review the public record, apply the established rules of claim construction, ascertain the scope of the patentee's claim invention and, thus, design around the claimed invention. Allowing the public record to be altered or changed by extrinsic evidence ..., such as expert testimony, would make this right meaningless. The same holds true whether it is the patentee or the alleged infringer who seeks to alter the scope of the claims.

Vitronics, 90 F.3d at 1583 (citations omitted). The parties do not rely upon any extrinsic evidence in this case; accordingly, the Court's review of the '482 Patent is limited to the intrinsic evidence of record before the Court.

B. *Construction of Claims*

1. Claim 7

The parties first seek construction of Claim 7 of the '482 Patent, which provides as follows:

7. An animal training apparatus comprising in combination:

(a) means for producing starting signals and stopping signals;

(b) a stimulator unit having first and second electrodes supported by a collar or harness to electrically contact skin of the animal;

(c) oscillator circuit means in the stimulator unit for selectively producing first and second signals having first and second substantially different numbers of pulses per second;

(d) manual control switch means for producing first and second starting signals and first and second stopping signals;

(e) first circuit means for selectively causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively, and causing the oscillator circuit means to stop the first and second signals in response to the first and second stopping signals, respectively;

(f) second circuit means connected to the oscillator circuit means producing first and second input currents in response to the first and second signals, respectively; and

(g) a transformer having a primary winding connected to the second circuit means and a secondary winding connected to the first and second electrodes and producing first and second output currents through the first and second electrodes and the skin in response to the first and second input currents, respectively, the first and second input currents and the transformer co-acting to produce a sufficiently high open circuit voltage to occur between the first and second electrodes to cause a selected one of the first and second output currents to electrically arc across a small gap and continue to flow through the first and second electrodes and the skin.

First, the parties seek construction of the introductory phrase of Claim 7, "[a]n animal training apparatus." At the *Markman* hearing, the parties conceded that there was no real difference between Tri-Tronics's proposed construction of this phrase, "an apparatus for training an animal," and Radio Systems's proposed construction, "an animal training apparatus." With respect to the following transitional phrase, "comprising in combination," Tri-Tronics contends that this transitional phrase means that the invention defined by Claim 7 includes the elements that follow such transitional phrase, without excluding additional, unrecited elements, while Radio Systems maintains that the phrase should be construed as "comprising in combination" only the limitations which follow. At the *Markman* hearing, however, Radio Systems conceded that Tri-Tronics's construction was correct. As the parties appear to agree that the introductory phrase of Claim 7 can be construed either as "an apparatus for training an animal" or "an animal training apparatus," and that the term "comprising in combination" means that the invention defined by Claim 7 must include the elements that follow such transitional phrase but that additional, unrecited elements could also be included in the invention, the Court need not construe the meaning of these phrases any further.

(a) "means for producing starting signals and stopping signals"

Tri-Tronics contends that this phrase of Claim 7 should be construed as a remote transmitter, localized attached leash, automatic sensor, or similarly functioning element to select the time that electrical stimulation begins and the time that electrical stimulation is discontinued. Radio Systems contends that the claimed function, "producing starting signals and stopping signals," is clear and unambiguous, but that the written description fails to disclose structure for performing this function, making it impossible to properly construe the limitation and rendering the claim invalid. If this limitation is to be construed, Radio Systems argues that it should be construed to mean circuitry which must produce starting signals and stopping

signals that are transmitted to a receiver circuit. Radio System further argues that the structure required includes circuitry within a portable radio frequency transmitter that generates coded radio frequency signals that are compatible with the receiver circuit shown and described in Figures 2A, 2B, and 2C and/or with the receiver circuit used in the Model A170 system marketed by Tri-Tronics and the substantial equivalent thereof.

This limitation is written in a "means-plus-function" format pursuant to 35 U.S.C. s. 112, paragraph 6, which provides as follows:

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.

The construction of a means-plus-function limitation is a two-step process. First, the Court must determine the claimed function. JVW Enterprises, Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1330 (Fed.Cir.2005). In doing so, the Court must be careful to avoid limiting a means-plus-function claim "by adopting a function different from that explicitly recited in the claim." Id. at 1331 (quoting Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1258 (Fed.Cir.1999)). The Court must also avoid "importing the functions of a working device into the[ ] specific claims, rather than reading the claims for their meaning independent of any working embodiment." JVW, 424 F.3d at 1331 (quoting Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1303 (Fed.Cir.1999)).

Second, the Court must identify the corresponding structure in the specification that performs the function. JVW, 424 F.3d at 1330. Pursuant to 35 U.S.C. s. 112, paragraph 2, "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." B. Braun Med., Inc. v. Abbott Labs., 124 F.3d 1419, 1424 (Fed.Cir.1997).

Means-plus-function limitations are further subject to the definiteness requirement of s. 112:

[I]f one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.

In re Donaldson Co., 16 F.3d 1189, 1195 (Fed.Cir.1994) (en banc). Like the construction of claims, whether the specification recites an adequate disclosure of structure so as to satisfy the definiteness requirement of section 112, paragraph 2 is an issue that must be determined in light of the knowledge of one skilled in the art. *See* Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1380 (Fed.Cir.1999).

The '482 Patent specification teaches that one of the objects of the invention is to provide a training apparatus that "controls the time of initiation and termination of electrical stimulation independently of the degree of stimulation applied to an animal." Col. 2, lines 64-68. In this regard, the specification notes "that it is highly desirable that the trainer using the remote transmitter 1 be able to ... immediately terminate the stimulation the moment the animal ceases the undesired behavior or performs the desired behavior," and that the "termination of electrical stimulation then serves as a reward to the dog and reinforces the behavior

occurring at that moment." Col. 5, lines 67-col. 6, line 7.

The '482 Patent describes the portable transmitter of Fig. 1 as being able to transmit RF control signals to a collar-mounted receiver-stimulator unit 3. *See* col. 4, lines 3-7. The '482 Patent further describes receiver circuit 7 as decoding the transmitter control signals received from remote transmitter 1 and producing a corresponding high level stimulation control signal on one of conductors 7A, 7B, and 7C, depending on the level of electrical stimulation selected. *See* col. 4, lines 27-35. The '482 Patent further explains that such "means" need not be a remote transmitter, but could include a localized source of such signals, such as controls provided in the handle of a dog leash. *See* col. 7, lines 7-13.

Tri-Tronics contends that the specification also explains that the "means" for producing the start and stop signals could be an automatic sensor, such as a bark sensor provided within a bark limiter system to sense different barking behaviors. *See* col. 7, lines 15-23. The Court does not read the "means" referenced in Claim 7 so broadly, however, in light of the limitation set forth in subsection (d), which provides for a "manual control switch means" for producing starting and stopping signals in the device. An automatic bark sensor that is capable of starting and stopping the electrical stimulation would obviate the need for a manual control switch, as described in subsection (d). Thus, to construe subsection (a) in the broad manner suggested by Tri-Tronics would be in conflict with the other limitations of Claim 7. Accordingly, the Court will not construe the means for producing the starting and stopping signals in the device as claimed by Claim 7 to include an automatic bark sensor.

Based upon the foregoing, the Court finds that the written description adequately discloses a structure for performing the claimed function. Accordingly, it is **RECOMMENDED** that the stated function of the limitation "means for producing starting signals and stopping signals" be construed as the production of starting signals and stopping signals and that the means for this function be construed as a remote transmitter, localized attached leash, or substantial equivalent thereof.

(b) "a stimulator unit having first and second electrodes supported by a collar or harness to electrically contact skin of the animal"

Tri-Tronics contends this phrase of Claim 7 should be construed to mean a stimulator unit supported by a collar worn about a portion of the animal's body, and having a pair of electrodes that contact the animal's skin for applying an electroshock signal thereto. Radio Systems contends, on the other hand, that this limitation should be construed to require a stimulator unit having first and second electrodes, with the electrodes being supported by a collar or harness so as to make electrical contact with the skin of the animal.

Radio Systems argues that Tri-Tronics is seeking to improperly rewrite this limitation to omit the requirement that the "electrodes" be supported by a collar or harness, and replace that requirement with a requirement that the "stimulator unit" be supported by the collar or harness. Relying upon Fig. 1, which depicts the collar/stimulator unit assembly, Radio Systems argues that this limitation "explicitly requires that the electrodes by supported by a collar or harness, and the specification clearly discloses that the electrodes extend through and are, therefore, supported by, the collar." [Doc. 28].

The difficulty in construing this particular limitation comes from the lack of commas in the phrase. For example, if the drafter had inserted a comma, such that the limitation read "a stimulator unit, having first and second electrodes supported by a collar or harness," the phrase "supported by" would clearly be in

reference to the "first and second electrodes." If the drafter had inserted two commas, such that the limitation read "a stimulator unit, having first and second electrodes, supported by a collar or harness," the phrase "supported by" would clearly be in reference to the term "stimulator unit." However, for whatever reason, the drafter did neither, and the Court is left with an arguably ambiguous phrase.

Turning to the specification, the Court finds that the specification supports the construction proposed by Tri-Tronics. The specification describes a "collar-mounted receiver-stimulator unit worn by an animal in response to remote stimulus control signals produced by a remote transmitter operated by a trainer." Col. 1, lines 6-11. It further describes electrodes 8 and 9 that are connected to an output transformer in receiver 3, and which extend through the collar to contact the skin of the dog's neck. Col. 4, lines 8-11. Obviously, such electrodes can "extend through" the collar without being supported by (or even touching) the collar; thus, it would not be appropriate to construe this limitation in the narrow manner Radio Systems suggests. Accordingly, it is **RECOMMENDED** that the limitation "a stimulator unit having first and second electrodes supported by a collar or harness to electrically contact skin of the animal" be construed to mean a stimulator unit supported by a collar worn about a portion of the animal's body, and having a pair of electrodes that contact the animal's skin for applying an electroshock signal thereto.

(c) "oscillator circuit means in the stimulator unit for selectively producing first and second signals having first and second substantially different numbers of pulses per second"

The parties agree that this is also a means-plus-function limitation. Tri-Tronics contends that this phrase of Claim 7 should be construed to mean that the collar-supported stimulator unit includes oscillator circuitry (or other circuitry that functions in an equivalent manner to oscillator circuitry) for producing at least first and second signals that have substantially different numbers of pulses per second from each other. Tri-Tronics contends that this construction would allow the use of three gated oscillator circuits or a single oscillator circuit capable of selectively oscillating at different frequencies.

Radio Systems argues that Tri-Tronics's proposed construction is overly broad in that a single oscillator circuit structure is not illustrated nor described in the specification with enough detail to satisfy the requirements of 35 U.S.C. s. 112, paragraphs 2 and 6. Instead, Radio Systems contends that this limitation should be construed to mean two or more oscillator circuits connected in parallel, the outputs of the oscillator circuits feeding an OR gate allowing one of the oscillator circuit outputs to be individually selected.

The Court finds that the stated function of this claim is to selectively produce first and second signals having first and second substantially different numbers of pulses per second. To determine the means for this limitation, the Court turns to the specification. The specification explains that the stimulator unit includes a gated 250 Hertz oscillator circuit 61 (corresponding to 250 pulses per second); a 40 Hertz gated oscillator circuit 62 (corresponding to 40 pulses per second); and a 10 Hertz gated oscillator circuit 63 (corresponding to 10 pulses per second). *See* col. 4, lines 39-47. The specification states that conductors 18A, 18B, and 18C couple the output signals of the oscillator circuits 61, 62 and 63 to one of the inputs of a three-input OR gate 23. Col. 4, line 66-Col. 5, line 1. The specification goes on to state that "[i]nstead of using three gated oscillator circuits, a single oscillator circuit capable of selectively oscillating at different frequencies could be used." Col. 7, lines 13-15. Based upon the foregoing, the Court finds that the written description adequately discloses a structure for performing the claimed function. Accordingly, it is **RECOMMENDED** that the function of the limitation "oscillator circuit means in the stimulator unit for selectively producing first and second signals having first and second substantially different numbers of

pulses per second" be construed as selectively producing first and second signals that have first and second substantially different numbers of pulses per second and that the means for this function be construed to mean oscillator circuitry (or other circuitry that functions in an equivalent manner to oscillator circuitry) in the stimulator unit for selectively producing at least first and second signals having first and second substantially different numbers of pulses per second.

(d) "manual control switch means for producing first and second starting signals and first and second stopping signals"

Tri-Tronics contends that this means-plus-function limitation should be construed as switches, buttons, sensors or similarly functioning elements, remotely or locally, to select between at least two different levels of stimulation, as well as to select the time that electrical stimulation begins and the time that electrical stimulation is discontinued.

Radio Systems contends, on the other hand, that the identified function is producing first and second starting signals and first and second stopping signals and that the manual control switch means should be construed to include two independent push-button switches that are manually operable by a human operator with each switch causing both a starting signal and a stopping signal to be generated for a total of two distinct starting signals and two distinct stopping signals and any substantial equivalent thereof. Radio Systems further contends that the inclusion of manual control switch means precludes a construction of Claim 7 that encompasses a bark limiter system as proposed by Tri-Tronics.

The parties agreed at the *Markman* hearing that this limitation excludes the use of an apparatus wherein the termination of the stimulation is based upon the expiration of a set time period for termination.

The Court finds that the function identified in this limitation is the production of first and second starting signals and first and second stopping signals. To determine the means, the Court turns again to the specification. It describes the portable transmitter of Figure 1 as being able to transmit RF control signals to a collar-mounted receiver-stimulator unit 3. *See* col. 4, lines 3-7. The specification further describes reference numerals 1A and 1B as designating two control switches on the portable transmitter that allow immediate remote selection of high, medium, and low degrees of electrical stimulation:

Reference numerals 1A and 1B designate two control switches that allow immediate remote selection of high, medium, and low degrees of electrical stimulation applied to the dog via electrodes 8 and 9. When control switch 1A only is depressed, the low degree of electrical stimulation is selected. When control switch 1B only is depressed, the medium degree of electrical stimulation is selected. When both control switches 1A and 1B are depressed, the high degree of electrical stimulation is selected.

Col. 4, lines 11-21.

Based upon the specification, the Court finds that the manual control switch means should be construed to include two independent push-button switches that are manually operable by a human operator with each switch causing both a starting signal and a stopping signal to be generated for a total of two distinct starting signals and two distinct stopping signals and any substantial equivalent thereof.

Tri-Tronics argues that substantial equivalents should not be limited to dual push-button switches. For example, Tri-Tronics argues, it would be within the knowledge of those skilled in the art to include a single

push-button along with a selector switch, the selector switch selecting between two or more different levels of stimulation, and the push-button switch being used to start (when depressed) and to stop (when released) a control signal of the selected intensity. Tri-Tronics further argues electro-mechanical devices which function as bark limiters are also structural equivalents to push-buttons and/or other forms of control switches.

The Court will not determine at this time what the "equivalents thereof" are of the means disclosed in the specification, as such would require the resolution of questions of fact beyond the scope of the issue referred to the undersigned. *See* Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1467 (Fed.Cir.1998) ("To determine the scope of [ ] equivalents, the district court must resolve questions of fact by resorting to the expertise of the fact finder."). The Court does find, however, that the use of a "manual control switch" means precludes a construction of Claim 7 that encompasses a bark limiter system, as such a system would necessarily rely upon the use of bark sensors to produce starting and stopping signals and not a manual switch as specified by the claim language.

Accordingly, it is **RECOMMENDED** that the function of "manual control switch means for producing first and second starting signals and first and second stopping signals" be construed as the production of first and second starting signals and first and second stopping signals, and that the manual control switch means be construed to include two independent push-button switches that are manually operable by a human operator with each switch causing both a starting signal and a stopping signal to be generated for a total of two distinct starting signals and two distinct stopping signals and any substantial equivalent thereof. It is further **RECOMMENDED** that Claim 7 be construed to exclude both a bark limiter system that relies upon the use of bark sensors and an apparatus wherein the termination of the stimulation is based upon the expiration of a set time period for stimulation.

(e) "first circuit means for selectively causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively, and causing the oscillator circuit means to stop the first and second signals in response to the first and second stopping signals, respectively"

Tri-Tronics contends that this means-plus-function limitation should be construed to mean a first circuit that causes the oscillator circuit to start producing a first pulsed signal in response to the first starting signal; that causes the oscillator circuit to stop producing the first pulsed signal in response to the first stopping signal; that causes the oscillator circuit to start producing the second pulsed signal in response to the second starting signal; and that causes the oscillator circuit to stop producing the second pulsed signal in response to the second stopping signal.

Radio Systems contends that the first stated function for the first circuit means is selectively causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively. Based upon the structure disclosed in the specification, Radio Systems contends that the first circuit means should be construed as an antenna in communication with a radio frequency receiver circuit that decodes the transmitter control signals and selectively produces a high level control signal on one of a plurality of output conductors in response to the first and second start signals and any substantial equivalent of such a structure.

Radio Systems further contends that the second stated function for the first circuit means is selectively causing the oscillator circuit means to stop the first and second signals in response to the first and second

starting signals, respectively; thus, Radio Systems contends, the radio frequency receiver circuit of the first circuit means also selectively produces a low level control signal on one of the output conductors in response to the first and second stop signals, and, therefore, is also implicated in performing the second stated function.

The Court must reject Tri-Tronics's proposed construction because it identifies only the function of the limitation and fails to identify the corresponding structure in the specification that performs the claimed function. *See* JVW, 424 F.3d at 1330 (stating court must first identify function and then identify the corresponding structure in the specification that performs the function).

The Court finds that this limitation states two specific functions: (1) selectively causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively and (2) selectively causing the oscillator circuit means to stop the first and second signals in response to the first and second signals, respectively.

With respect to the first function, the '482 specification states as follows:

Referring next to FIG. 2A, reference numeral designates an antenna 6 connected to a radio frequency receiver circuit 7, which can be similar to the circuitry contained in [Tri-Tronics's] commercially marketed Model A170 system.

In accordance with the present invention, receiver circuit 7 decodes the transmitter control signals received from remote transmitter 1 and produces a corresponding high level stimulation control signal on one of conductors 7A, 7B, and 7C, which causes the receiver unit 3 to produce a corresponding number of current pulses per second through electrodes 8 and 9, thereby producing the selected degree of electrical stimulation appropriate to the present training situation.

Col. 4, lines 22-35. The specification goes on state, referring to Figure 2B, that one of the three conductors 7A, 7B, or 7C applies a high level to one of the oscillator control conductors 12A, 12B, and 12C, respectively. Col. 4, lines 36-39. Conductor 12A is the control input to a gated oscillator circuit 61, which when selected with a high level input, oscillates at a frequency of 250 Hertz; that conductor 12B is the control input to a second gated oscillator circuit 62, which when selected with a high level input, oscillates at a frequency of 40 Hertz; and that conductor 12C is the control input to a third gated oscillator circuit 63, which when selected with a high level input, oscillates at a frequency of 10 Hertz. *See* col. 4, lines 39-47.

With respect to the second stated function, the specification, referring to Figure 2A, describes "[w]hen the control signal on conductor 7A, 7B, or 7C goes low, the voltage on conductor 12 goes low, and hence the voltage on conductor 15 is pulled to ground, causing Schmitt trigger 17 to force the voltage on conductor 18 to its high level resting state." Col. 5, lines 40-44. Thus, the Court finds that the radio frequency receiver circuit of the first circuit means also selectively produces a low level control signal on one of the output conductors in response to the first and second stopping signals, and therefore, is also implicated in performing the second stated function.

Based upon the foregoing, it is **RECOMMENDED** that the functions of the limitation "first circuit means for selectively causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively, and causing the oscillator circuit means to stop the first and second signals in response to the first and second stopping signals, respectively" be construed to be (1) selectively

causing the oscillator circuit means to start the first and second signals in response to the first and second starting signals, respectively and (2) selectively causing the oscillator circuit means to stop the first and second signals in response to the first and second signals, respectively. It is further **RECOMMENDED** that the means for these stated functions be construed as an antenna in communication with a radio frequency receiver circuit that decodes the transmitter control signals and selectively produces a high level control signal on one of a plurality of output conductors in response to the first and second start signals and any substantial equivalent of such a structure.

(f) "second circuit means connected to the oscillator circuit means producing first and second input currents in response to the first and second signals, respectively"

The function described by this limitation can be identified as producing first and second input currents in response to the first and second signals, respectively. With regard to the relevant structure, the structure identified must be connected to the oscillator circuit means. Both parties cite col. 5, lines 1-6 of the specification, which, in reference to Figure 2B, describes that the output of the OR gate 23 is connected to the input of a driver circuit 28, the output of which is connected to the base of NPN transistor 49, the emitter of which is connected to ground, and the collector of which is coupled to a primary winding 50 of a transformer 64.

For these reasons, it is **RECOMMENDED** that the function of the limitation "second circuit means connected to the oscillator circuit means producing first and second input currents in response to the first and second signals, respectively" be construed as producing first and second input currents in response to the first and second signals, respectively, and that the means for this function be construed as being connected to the oscillator circuit means and including a NPN transistor, the base being connected to a driver circuit, the emitter being connected to ground, and the collector being connected to the primary winding of a transformer and any substantial equivalent thereof.

(g) "a transformer having a primary winding connected to the second circuit means and a secondary winding connected to the first and second electrodes and producing first and second output currents through the first and second electrodes and the skin in response to the first and second input currents, respectively, the first and second input currents and the transformer co-acting to produce a sufficiently high open circuit voltage to occur between the first and second electrodes to cause a selected one of the first and second output currents to electrically arc across a small gap and continue to flow through the first and second electrodes and the skin"

Tri-Tronics contends that this phrase of Claim 7 should be construed to mean an electrical transformer having a primary winding and a secondary winding, wherein the primary winding is connected to the above-described second circuit means, and wherein the secondary winding is connected across the first and second electrodes supported by the collar; that the transformer produces one of at least two different output currents through the first and second electrodes, and through the animal's skin, in response to one of the at least two input currents applied to the primary winding of the transformer; and that the input currents that are coupled to the primary winding of the transformer produce a sufficiently high open circuit voltage across the secondary winding of the transformer to produce electrical arcs across a one-eighth gap between the electrodes and the animal's skin.

Radio Systems contends that this limitation is clear and unambiguous, and that resort to the specification to redefine the phrase in unnecessary.

Tri-Tronics concedes that, apart from the parties' disagreement as to whether it is appropriate to consult the specification and drawings, it appears that the parties do not really differ as to the meaning to be given to this phrase. The Court notes that Tri-Tronics is correct that the Court may always refer to the patent specification when interpreting claim terms, with the caution that limitations relating to preferred embodiments generally should not be read into the claims. *See* Texas Digital, 308 F.3d at 1205.

The specification states that the selected stimulation control signal is utilized to control a circuit that produces a selected number of current pulses per second through the primary winding of an output transformer, and that the terminals of the secondary windings of the transformer are connected to the electrodes. *See* col. 3, lines 12-17. The specification further explains that the collector of NPN transistor 49 is coupled to a primary winding 50 of a transformer 64; that the other terminal of primary winding 50 is connected to V+; and that the secondary winding 51 of transformer 64 is connected between electrodes 8 and 9, so that an open circuit stimulus voltage of roughly 5,000 volts is applied between electrodes 8 and 9 at the frequency of the signal produced on conductor 18A, 18B or 18C by the selected gated oscillator circuit 61, 62, or 63. *See* col. 5, lines 1-14.

The specification further explains, with regard to Fig. 4, that the tips of electrodes 8 and 9 of the receiver-stimulator unit 3 convey current pulses that produce the electrical stimulus to flow through the dog's skin, *see* col. 6, lines 23-26, and that the high voltage signal applied between electrodes 8 and 9 is produced at the frequency of the selected oscillator circuit, *see* col. 5, lines 8-14.

The specification also states with regard to Fig. 4 that the open circuit voltage between the electrodes is sufficiently high (*i.e.,* 5,000 volts) so that electrical arcs between the skin and the electrodes can be maintained and the dog receives electrical stimulation even if there is a gap of as much as one-eighth of an inch between the electrodes and the skin of the dog's neck. *See* col. 6, lines 30-36.

Upon review of the specification, it is **RECOMMENDED** that the limitation "a transformer having a primary winding connected to the second circuit means and a secondary winding connected to the first and second electrodes and producing first and second output currents through the first and second electrodes and the skin in response to the first and second input currents, respectively, the first and second input currents and the transformer co-acting to produce a sufficiently high open circuit voltage to occur between the first and second electrodes to cause a selected one of the first and second output currents to electrically arc across a small gap and continue to flow through the first and second electrodes and the skin" be construed as an electrical transformer having a primary winding and a secondary winding, wherein the primary winding is connected to the above-described second circuit means, and wherein the secondary winding is connected across the first and second electrodes supported by the collar; that the transformer produces one of at least two different output currents through the first and second electrodes, and through the animal's skin, in response to one of the at least two input currents applied to the primary winding of the transformer; and that the input currents that are coupled to the primary winding of the transformer produce a sufficiently high open circuit voltage across the secondary winding of the transformer to produce electrical arcs across a one-eighth gap between the electrodes and the animal's skin.

2. Claim 9

a. "The animal training apparatus of claim 7"

The parties agree that Claim 9 is dependent upon Claim 7 and includes all of the limitations discussed in regard to Claim 7.

b. "wherein the first and second numbers of pulses per second are approximately 40 and 250, respectively"

Tri-Tronics argues that this portion of Claim 9 should be construed to mean that the animal training apparatus is capable of selecting at least two different levels of electrical stimulation, that one of such levels produces electrical stimulation that includes approximately 40 pulses per second, and that a second of such levels produces electrical stimulation that includes approximately 250 pulses per second.

Radio Systems argues that the language of this claim is clear and unambiguous, and that resort to the specification to construe or redefine the claim is unnecessary. The Court finds that the specification does not compel a construction different from the plain meaning of the claim terms themselves, and therefore, it is **RECOMMENDED** that the limitation "wherein the first and second numbers of pulses per second are approximately 40 and 250, respectively" be construed to mean that the first and second numbers of pulses per second produced by the oscillator circuit means of Claim 7 are approximately 40 and 250, respectively.

3. Claim 10

a. "The animal training apparatus of claim 8 or 9"

The parties agree that Claim 10 should be construed to include all of the elements discussed with respect to Claim 7 and Claim 9. Tri-Tronics has not asserted infringement of Claim 8 in this litigation.

b. "wherein the first and second input currents and the transformer are selected to cause the open circuit output voltage of the transformer to be approximately 5,000 volts"

Tri-Tronics contends that this portion of Claim 10 should be construed to mean that the pulsed currents applied to the primary winding of the transformer, and the transformer itself, are selected to produce an open circuit output voltage of approximately 5,000 volts when either the first level of stimulation is selected or the second level of stimulation is selected. In support of this construction, Tri-Tronics cites the specification, which explains that the secondary winding 51 of transformer 64 applies an open circuit stimulus voltage "of roughly 5,000 volts" between electrodes 8 and 9, *see* col. 5, lines 8-14, and that an open circuit voltage of 5,000 volts is sufficiently high to maintain electrical arcs 67 and 68 between the skin 66 and electrodes 8 and 9, *see* col. 6, lines 30-36.

Radio Systems argues, on the other hand, that the language of this limitation is clear and unambiguous, and that resort to the specification to construe or redefine the language is unnecessary.

The Court finds that the specification supports Tri-Tronics's proposed construction of this limitation. Accordingly, it is **RECOMMENDED** that the limitation "wherein the first and second input currents and the transformer are selected to cause the open circuit output voltage of the transformer to be approximately 5,000 volts" be construed to mean that the pulsed currents applied to the primary winding of the transformer, and the transformer itself, are selected to produce an open circuit output voltage of approximately 5,000 volts when either the first level of stimulation is selected or the second level of stimulation is selected.

4. Claim 12

The parties also seek construction of the limitations set forth in Claim 12, which provides as follows:

12. A training apparatus comprising in combination:

(a) means for selectively producing and terminating a control signal;

(b) a stimulator unit including a harness or collar and first and second electrodes that extend from the harness or collar through the fur to the skin of an animal to apply electrical stimulation thereto;

(c) first circuit means in the stimulator unit for beginning and terminating first and second stimulation control signals in immediate response to the beginning and terminating of the control signal;

(d) second circuit means for (1) beginning and terminating a first signal burst including a first number of current pulses per second in response to the first stimulation control signal, and (2) beginning and terminating a second signal burst including a second number of current pulses per second in response to the second stimulation control signal, the second number being substantially greater than the first number; and

(e) a transformer having a primary winding coupled to the second circuit means to conduct the current pulses, and a secondary winding, the secondary winding having first and second terminals coupled to first and second electrodes, respectively, the primary winding, secondary winding, and the second circuit means operating to cause an open circuit voltage difference between the first and second electrodes to be equally high for current pulses of either of the first and second signal bursts.

As with Claim 7, the parties with respect to Claim 12 seek construction of the introductory phrase "[a] training apparatus" and the transitional phrase "comprising in combination." Based upon the parties' concessions at the *Markman* hearing, however, there does not appear to be any real dispute regarding the meaning of these phrases. As the parties appear to agree on the construction of the introductory phrases of Claim 12, the Court need not construe their meaning any further.

(a) "means for selectively producing and terminating a control signal"

Tri-Tronics contends that this means-plus-function limitation should be construed as a remote transmitter, localized attached leash, automatic sensor, or similarly functioning element to generate a control signal that indicates: (1) the time that electrical stimulation is to begin; (2) the time that electrical stimulation is to be discontinued; and (3) one of two or more levels of stimulation desired.

Radio Systems agrees that the function includes generating signals which indicate the time that electrical stimulation is to begin, and the time that electrical stimulation is to be discontinued. Radio Systems argues, however, that the written description fails to disclose structure for performing this function, making it impossible to properly construe this limitation and rendering the claim invalid. If forced to provide a construction, Radio Systems argues that the structure should be construed as a portable radio frequency transmitter that generates coded radio frequency signals in response to actuation of a manual button on the portable radio frequency transmitter housing and that the coded radio frequency control signals are compatible with the receiver circuit shown and described in Figures 2A, 2B and 2C or with the receiver circuit used in the Model A170 system marketed by Tri-Tronics or a substantially equivalent structure.

The specification describes the portable transmitter of Fig. 1 as being able to transmit RF control signals to

a collar-mounted receiver stimulator unit 3, *see* col. 4, lines 3-7. The '482 Patent further describes receiver circuit 7 as decoding the transmitter control signals received from remote transmitter 1 and producing a corresponding high level stimulation control signal on one of conductors 7A, 7B, and 7C, depending on the level of electrical stimulation selected, *see* col. 4, lines 27-35. The specification further describes reference numerals 1A and 1B as designating two control switches on a portable transmitter that allow immediate remote selection of high, medium, and low degrees of electrical stimulation. *See* col. 4, lines 11-21.

The specification goes on to explain this is just one particular embodiment of the invention, and that those skilled in the art will be able to make numerous modifications to the described embodiment without departing from the true spirit and scope of the invention. Col. 6, lines 64-68. It further explains that such "means" need not be a remote transmitter, but could include a localized source of such signals, such as controls provided in the handle of a dog leash, *see* col. 7, lines 7-13. Furthermore, the specification explains that the "means" for producing the start and stop signals could be an automatic sensor, such as a bark sensor provided within a bark limiter system to sense different barking behaviors, and to select the degree of stimulation when a certain undesired behavior is sensed and then immediately terminate the selected degree of stimulation when the undesired behavior stops. *See* col. 7, lines 15-23.

Unlike Claim 7, which contains a manual control switch limitation, Claim 12 has no such limitation. Accordingly, the Court finds that the language of Claim 12 encompasses the use of a bark sensor as means to selectively produce and terminate the control signal.

Based on the foregoing, the Court finds that the written description adequately discloses a structure for performing the claimed function. Accordingly, it is **RECOMMENDED** that the function of the limitation "means for selectively producing and terminating a control signal" be construed as the generating of signals, which indicate the time that electrical stimulation is to begin, the time that electrical stimulation is to be discontinued, and one of two or more levels of stimulation desired. Based upon the structure disclosed in the specification, it is **RECOMMENDED** that the means of this limitation of Claim 12 be construed as a remote transmitter, localized attached leash, automatic sensor, or a substantially equivalent structure.

(b) "a stimulator unit including a harness or collar and first and second electrodes that extend from the harness or collar through the fur to the skin of an animal to apply electrical stimulation thereto"

Tri-Tronics contends that this phrase of Claim 12 should be construed to mean a stimulator unit supported by a collar worn about a portion of the animal's body, and having a pair of electrodes that extend through an animal's fur and contact the animal's skin for applying an electroshock signal thereto.

Radio Systems contends, on the other hand, that the stimulator unit should be construed to include a harness or collar and first and second electrodes that extend from the harness or collar through the fur to the skin of an animal to apply electrical stimulation thereto. Radio Systems argues that Tri-Tronics's proposed construction improperly omits the requirement that the electrodes extend from the harness or collar. Radio Systems argues that the limitation explicitly requires that the electrodes extend from the harness or collar, and that the specification clearly supports this construction by disclosing in Figure 1 that the electrodes extend through and from the collar.

The Court agrees with Radio Systems that Tri-Tronics's proposed claim construction improperly omits the requirement that the electrodes "extend from the harness or collar." The limitation explicitly requires that the electrodes extend *from* the harness or collar. The limitation does not provide that the electrodes extend from

the stimulator unit and *through* the collar, as proposed by Tri-Tronics. The Court notes that this distinction may just be a matter of semantics, however, since this claim explicitly states that the harness or collar is included as part of the "stimulator unit." Thus, even if the electrodes are deemed to extend from the harness or collar, they are technically also extending from the stimulator unit as well, since the harness or collar is considered part of the "stimulator unit." Accordingly, it is **RECOMMENDED** that this phrase of Claim 12 be construed to mean a stimulator unit that includes a harness or collar and first and second electrodes that extend from the harness or collar through the fur to the skin of an animal to apply electrical stimulation thereto.

(c) "first circuit means in the stimulator unit for beginning and terminating first and second stimulation control signals in immediate response to the beginning and terminating of the control signal"

Tri-Tronics contends that this means-plus-function limitation should be construed to mean that the collar-supported stimulator unit includes a first circuit for beginning a first stimulation control signal in response to the beginning of a first control signal; for terminating the first stimulation control signal in response to the termination of the first control signal; for beginning a second stimulation control signal in response to the beginning of a second control signal; and for terminating the second stimulation control signal in response to the termination of the second control signal. Tri-Tronics, however, fails to identify the corresponding structure in the specification for this claimed function.

Radio Systems contends that a first stated function for the first circuit means is beginning and terminating first and second stimulation control signals in immediate response to the beginning and terminating of the control signal, and that the first circuit means should be construed as an antenna in communication with a radio frequency receiver circuit that decodes the transmitter control signals and immediately produces a high level stimulation control signal on one of a plurality of output conductors in response to the beginning of the received control signal and any structural equivalents thereto.

Radio Systems argues that a second stated function for the first circuit means is selectively causing the oscillator circuit means to stop the first and second signals in immediate response to the first and second starting signals, respectively. Radio Systems contends that the radio frequency receiver circuit of the first circuit means also selectively produces a low level stimulation control signal on one of the output conductors in immediate response to the first and second stop signals. With respect to both functions, Radio Systems argues that the only acceptable delay between the termination of the control signal and the generation of the low level stimulation control signal is the normal transmission delay for radio frequency signals.

The specification explains that the receiver circuit 7 decodes the transmitter control signals received from remote transmitter 1 and produces a corresponding high level stimulation control signal on one of conductors 7A, 7B, and 7C. *See* col. 4, lines 27-35. The specification further states that the three conductors 7A, 7B, and 7C apply a high level to one of the oscillator control conductors 12A, 12B, and 12C, respectively. *See* col. 4, lines 36-39. The specification further explains that conductor 12A is the control input to a gated 250 Hertz oscillator circuit 61 (corresponding to 250 pulses per second); that conductor 12B is the control input to 40 Hertz gated oscillator circuit 62 (corresponding to 40 pulses per second); and that conductor 12C is the control input to 10 Hertz gated oscillator circuit 63 (corresponding to 10 pulses per second). *See* col. 4, lines 39-47. The specification further states that "[i]nstead of using three gated oscillator circuits, a single oscillator circuit capable of selectively oscillating at different frequencies could be used.

See col. 7, lines 13-15.

The specification further explains that "the basic technique of the invention could be utilized without the remote transmitter in a device in which controls on the handle on the leash are coupled to a stimulator unit," and that "[i]nstead of using radio control signals, direct electrical connections could be utilized to select the appropriate one of gated oscillators 61, 62, and 63." Col. 7, lines 7-13. Accordingly, the Court finds that it would be inappropriate to limit the meaning of the "first circuit means in the stimulator unit" within Claim 12 to only a system that includes a remote transmitter, antenna, and/or radio frequency receiver.

With respect the "acceptable delay" for the purposes of an "immediate response to the beginning and terminating of the control signal," the specification states that control over the time of termination is important to coincide with the time that "the dog ceases an undesired activity (or begins a desired activity)." *See* col. 6, lines 41-63. Thus, in terms of an "acceptable delay" for purposes of an "immediate response to the beginning and terminating of the control signal," what is significant is whether such delay can be recognized by the animal be trained. The Court finds that a delay of fraction of second would not likely be noticed by an animal, and that Radio Systems's contention that the "only acceptable delay" between the beginning of the control signal and the generation of the stimulation control signal, and between the termination of the control signal and the termination of the stimulation control signal, "is the normal transmission delay for radio frequency signals," is not supported by the written description and therefore must be rejected.

For the foregoing reasons, it is **RECOMMENDED** that the functions of the limitation "first circuit means in the stimulator unit for beginning and terminating first and second stimulation control signals in immediate response to the beginning and terminating of the control signal" be construed as (1) beginning and terminating first and second stimulation control signals in immediate response to the beginning and terminating of the control signal and (2) selectively causing the oscillator circuit means to stop the first and second signals in immediate response to the first and second starting signals, respectively. Furthermore, based upon the structure disclosed in the specification, it is **RECOMMENDED** that the means expressed in this phrase of Claim 12 be construed as a receiver circuit in the stimulator unit which decodes control signals transmitted locally or remotely and which produces a corresponding stimulation control signal on one of a plurality of output conductors in response to the beginning of the received control signal and any structural equivalents thereto.

(d) "second circuit means for (1) beginning and terminating a first signal burst including a first number of current pulses per second in response to the first stimulation control signal, and (2) beginning and terminating a second signal burst including a second number of current pulses per second in response to the second stimulation control signal, the second number being substantially greater than the first number"

Tri-Tronics contends that this means-plus-function limitation should be construed to mean oscillator circuitry (or other circuitry that functions in an equivalent manner to oscillator circuitry) for producing at least first and second signals that have different numbers of pulses per second from each other, as well as circuitry that is connected to the oscillator circuitry and responsive to the pulsed signals produced by the oscillator circuitry, and responsive to the first and second stimulation control signals, for producing at least a first signal burst during the occurrence of the first stimulation control signal or a second signal burst during the occurrence of the second stimulation control signal, the two signal bursts having first and second numbers of current pulses per second, respectively. Tri-Tronics further submits that the term "substantially

greater" includes: (a) increasing the number of pulses per second by approximately 30 pulses per second or more and (b) increasing the number of pulses per second by a factor of approximately 4 or more.

Radio Systems contends that there are two stated functions for the second circuit means, and that these functions are identical except that they operate on different signals. Radio Systems contends that the second circuit means for performing this function should be construed to mean a first oscillator circuit comprising a diode 14 having its cathode end being an input and the anode end being an output, the anode end of diode 14 connected to two resistor/diode pairs 19/20 and 21/22, a Schmitt trigger inverter circuit 17, and one terminal capacitor 16 and further including the OR gate 23, the driver circuit 28, and the NPN transistor 49, the base being connected to a driver circuit, the emitter being connected to ground, and the collector being connected to the primary winding of a transformer and any substantial equivalent thereof.

Radio Systems further contends that the second stated function is beginning and terminating a second number of current pulses per second in response to the second stimulation control signal. Accordingly, Radio Systems argues, the second circuit means should be construed to mean a second oscillator circuit having the structural limitations set forth above in parallel with the first oscillator circuit, the second oscillator circuit feeding the OR gate 23 and any structural equivalents thereto. Additionally, Radio Systems contends, the second oscillator circuit should be construed as having values for the resistors and capacitors that are different from the first oscillator circuit so as to produce first and second signals having first and second substantially different numbers of pulses per second and any substantial equivalent thereof. Radio Systems further contends that there is no structure illustrated or described in the specification with enough detail to satisfy the requirements of 35 U.S.C. s. 112, paragraphs 2 and 6 to support a construction allowing use of a single oscillator circuit capable of selectively operating at different frequencies.

The Court finds Radio Systems's contention that this phrase must be limited to the structure depicted in Figures 2B and 2C (which include an antenna, a radio frequency receiver circuit, and a remote transmitter) to be contrary to the express teachings of the specification, which states that the basic technique of the invention could be used without a remote transmitter and "[i]nstead of using radio signals, direct electrical connections could be utilized to select the appropriate one of gated oscillators 61, 62, and 63." *See* col. 7, lines 7-13. Thus, it would not be appropriate to limit the meaning of this limitation to a system that includes an antenna, radio frequency receiver circuit, and remote transmitter.

The '482 specification states that, in the preferred embodiment, the three conductors 7A, 7B, and 7C apply a high level to one of the oscillator control conductors 12A, 12B, and 12C, respectively. *See* col. 4, lines 36-39. The specification further explains that, in the preferred embodiment, conductor 12A is the control input to a gated 250 Hertz oscillator circuit 61 (corresponding to 250 pulses per second); that conductor 12B is the control input to 40 Hertz gated oscillator circuit 62 (corresponding to 40 pulses per second); and that conductor 12C is the control input to 10 Hertz gated oscillator circuit 63 (corresponding to 10 pulses per second). *See* col. 4, lines 39-47.

The specification explains that conductors 18A, 18B, and 18C couple the output signals of the gated oscillator circuits to one of the inputs of a three input OR gate 23; that the output of OR gate 23 is connected to the input of a driver circuit 28, the output of which is connected to the base of NPN transistor 49, the emitter of which is connected to ground, and the collector of which is coupled to a primary winding 50 of a transformer 64. *See* col. 4, line 66-col. 5, line 7.

With respect to the term "substantially greater," Claim 12 does not expressly define this term. However, the

examples described in the specification, relative to the preferred embodiments of the invention, aid in defining this term. Specifically, the specification describes a 250 Hertz oscillator (corresponding to 250 pulses per second); a 40 Hertz oscillator circuit (corresponding to 40 pulses per second); and a 10 Hertz oscillator circuit (corresponding to 10 pulses per second). *See* col. 4, lines 39-47. The Court finds that 250 pulses per second is "substantially greater" than 40 pulses per second, and 40 pulses per second is "substantially greater" than 10 pulses per second.

Accordingly, it is **RECOMMENDED** that the limitation "second circuit means for (1) beginning and terminating a first signal burst including a first number of current pulses per second in response to the first stimulation control signal, and (2) beginning and terminating a second signal burst including a second number of current pulses per second in response to the second stimulation control signal, the second number being substantially greater than the first number" has the claimed functions of (1) beginning and terminating a first number of current pulses per second in response to the first stimulation control signal and (2) beginning and terminating a second number of current pulses per second in response to the second stimulation control signal, and that the means for these functions be construed to mean oscillator circuitry (or other circuitry that functions in an equivalent manner to oscillator circuitry) for producing at least first and second signals that have different numbers of pulses per second from each other, as well as circuitry that is connected to the oscillator circuitry and responsive to the pulsed signals produced by the oscillator circuitry, and responsive to the first and second stimulation control signals, for producing at least a first signal burst during the occurrence of the first stimulation control signal or a second signal burst during the occurrence of the second stimulation control signal, the two signal bursts having first and second numbers of current pulses per second, respectively. It is further **RECOMMENDED** that the term "substantially greater" be construed to include: (a) increasing the number of pulses per second by approximately 30 pulses per second or more and (b) increasing the number of pulses per second by a factor of approximately 4 or more.

(e) "a transformer having a primary winding coupled to the second circuit means to conduct the current pulses, and a secondary winding, the secondary winding having first and second terminals coupled to first and second electrodes, respectively, the primary winding, secondary winding, and the second circuit means operating to cause an open circuit voltage difference between the first and second electrodes to be equally high for current pulses of either of the first and second signal bursts"

Tri-Tronics contends that the first part of this phrase of Claim 12, "a transformer having a primary winding coupled to the second circuit means to conduct the current pulses, and a secondary winding, the secondary winding having first and second terminals coupled to first and second electrodes, respectively," should be construed to mean an electrical transformer having a primary winding and a secondary winding, wherein the primary winding is connected to the above-described second circuit means, and wherein the secondary winding is connected across the first and second electrodes supported by the collar.

Radio Systems, on the other hand, contends that this limitation is clear and unambiguous, and that resort to the specification to redefine the phrase is unnecessary.

The specification explains that the selected stimulation control signal is utilized to control a circuit that produces a selected number of current pulses per second through the primary winding of an output transformer, and that the terminals of the secondary windings of the transformer are connected to the electrodes. *See* col. 3, lines 12-17. The specification also states that the collector of NPN transistor 49 is coupled to a primary winding 50 of a transformer 64; that the other terminal of primary winding 50 is

connected to +V; and that the secondary winding 51 of transformer 64 is connected between electrodes 8 and 9, so that an open circuit stimulus voltage of roughly 5,000 volts is applied between electrodes 8 and 9 at the frequency of the signal produced on conductor 18A, 18B or 18C by the selected gated oscillator circuit 61, 62, or 63. *See* col. 5, lines 1-14.

Accordingly, it is **RECOMMENDED** that the first part of this phrase of Claim 12, "a transformer having a primary winding coupled to the second circuit means to conduct the current pulses, and a secondary winding, the secondary winding having first and second terminals coupled to first and second electrodes, respectively," be construed to mean an electrical transformer having a primary winding and a secondary winding, wherein the primary winding connected to the above-described second circuit means, and wherein the secondary winding is connected across the first and second electrodes supported by the collar.

Tri-Tronics contends that the second part of this phrase of Claim 12, "the primary winding, secondary winding, and the second circuit means operating to cause an open circuit voltage difference between the first and second electrodes to be equally high for current pulses of either of the first and second signal bursts," should be construed to mean that the input currents that are coupled to the primary winding of the transformer produce an open circuit voltage across the secondary winding of the transformer that is sufficiently high to produce electrical arcs across a small gap between the electrodes and the animal's skin during both the first stimulation control signal and the second stimulation control signal.

Radio Systems again argues that this limitation is clear and unambiguous and that resort to the specification to redefine the term is unnecessary. Therefore, Radio Systems argues, this limitation should be construed to further require that the primary winding, and the secondary winding of the transformer construed above, and the second circuit means operate to cause an open circuit voltage difference between the first and second electrodes to be equally high for current pulses of either of the first and second signal bursts.

The '482 Patent specification summarizes the problems encountered by the prior art in attempting to vary stimulation levels. In so doing, the specification states that these efforts "have resulted in unacceptable variation in the open circuit voltage of the output transformer, the secondary windings of which are connected to the electrodes that contact the dog's skin"; and that such variation in open circuit voltage is "very undesirable because it can cause the intensity of the electrical stimulation as felt by the dog to vary widely according to variations in the moistness of the dog's skin, the tightness of the collar, and various movements by the dog." Col. 2, lines 21-30.

The specification states that one of the objects of the subject invention is "to provide an inexpensive remote training apparatus which provides a constant, high open circuit voltage level to stimulus electrodes regardless of the degree of electrical stimulation applied to the animal by means of the electrodes." Col. 2, lines 59-63. The specification further states that this objective is achieved in the preferred embodiments by applying

current pulses fixed in both duration and amplitude to the primary winding of the output transformer, so the open circuit voltage produced between the secondary windings of the transformer in response to the constant amplitude input current pulses also will be constant. Consequently, for high, medium, or low numbers of currents pulses per second (corresponding to high, medium, or low degrees of electrical stimulation, respectively), the desired degree of electrical stimulation is applied to the animal, even if the electrodes move as much as one-eighth of an inch away from the skin of the animal. This occurs because the open circuit voltage between the secondary windings, and hence the electrodes attached thereto, is high enough to

cause electrical arcing from the electrodes to the skin of the animal even at low selected numbers of current pulses per second.

Col. 3, lines 34-50.

The specification further states that an open circuit stimulus voltage "of roughly 5,000 volts is applied between electrodes 8 and 9 at the frequency of the signal produced on conductor 18A, 18B or 18C by the selected gated oscillator circuit 61, 62, or 63." Col. 5, lines 8-14. The specification also explains, in regard to Fig. 4, that the open circuit voltage between the electrodes is sufficiently high (for example, 5,000 volts), so that the dog receives the electrical stimulation even if there is a gap of as much as one-eighth of an inch between the electrodes and the skin of the dog's neck. *See* col. 6, lines 23-36. The specification also states that the described training apparatus "provides a sufficiently high open circuit voltage between electrodes 8 and 9 for the arcs 67 and 68 to occur at all selectable degrees of electrical stimulation." Col. 6, lines 37-40.

Accordingly, it is **RECOMMENDED** that the second part of this phrase of Claim 12, "the primary winding, secondary winding, and the second circuit means operating to cause an open circuit voltage difference between the first and second electrodes to be equally high for current pulses of either of the first and second signal bursts," be construed to mean that the input currents that are coupled to the primary winding of the transformer produce an open circuit voltage across the secondary winding of the transformer that is sufficiently high to produce electrical arcs across a small gap between the electrodes and the animal's skin during both the first stimulation control signal and the second stimulation control signal.

III. THE '484 PATENT

The '484 Patent claims an "Electrode Structure for Collar Mounted Training Apparatus." The parties seek construction only of Claim 4 of the '484 Patent. Claim 4 provides as follows:

4. In an electronic animal control apparatus including a strap adapted to be placed around a portion of an animal's body and supporting circuitry producing an electroshock signal in response to a command signal, the improvement comprising first and second electrodes attached to the receiver and extending toward the animal's body, each of the first and second electrodes including an elongated conductive probe connected to the control apparatus to receive the electroshock signal and an insulator surrounding a portion of that electrode, an end portion of that electrode extending only sufficiently far beyond the insulator to both ensure consistent electrical contact of that electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus between the first and second electrodes through the animal's fur when wet.

a. "In an electronic animal control apparatus"

Tri-Tronics contends that this phrase should be construed to mean an electronic device used for training or otherwise controlling an animal. Radio Systems argues that this claim language is clear and unambiguous and that resort to the specification to redefine the phrase is unnecessary. Accordingly, Radio Systems contends that this phrase should be construed to refer an improvement relating to "an electronic animal control apparatus."

The '484 Patent specification explains that this patent relates to "electronic animal training devices." Col. 1, lines 52-53. The specification further states that it is an "object of the invention to provide an optimum insulated electrode structure for a collar-supported electroshock apparatus which prevents shunting of

electroshock current by wet fur of an animal .... " Col. 2, lines 56-62. Accordingly, it is **RECOMMENDED** that the phrase "electronic animal control apparatus" be construed to mean an electronic device used for training or otherwise controlling an animal.

b. "including a strap adapted to be placed around a portion of an animal's body"

Tri-Tronics contends that this portion of Claim 4 should be construed to mean a strap or collar that is adapted to be placed around a portion of an animal's body, including without limitation, around the neck of a dog. Radio Systems again argues that the claim language is clear and unambiguous and that resort to the specification to redefine the phrase is unnecessary. Therefore, Radio Systems contends that this phrase should be construed as "including a strap adapted to be placed around a portion of an animal's body."

The Court finds that the specification supports a construction of this phrase to include a strap or collar that is adapted to be placed around a portion an animal's body, including without limitation, around the neck of a dog. In describing the background art, the specification described "a receiver unit supported beneath a collar around the dog's neck." Col. 1, lines 16-19. The specification also explains, with regard to Figures 1 and 2, that the RF receiver unit includes a "typical dog collar strap ...." Col. 3, lines 26-27. The specification further states that "if the collar was less than quite tightly disposed about the dog's neck, the electroshock stimulus was ineffective," and that "[m]any users failed to tighten the collar as tight as necessary." Col. 5, lines 30-34. Accordingly, it is **RECOMMENDED** that the phrase "including a strap adapted to be placed around a portion of any animal's body" be construed to mean a strap or collar that is adapted to be placed around a portion of an animal's body, including without limitation, around the neck of a dog.

c. "and supporting circuitry producing an electroshock signal in response to a command signal"

Tri-Tronics contends that this phrase of Claim 4 should be construed to mean circuitry within the collar-supported receiver unit that is responsive to a triggering signal to produce an electrical shock stimulus signal for application to the animal being trained. Radio Systems contends that the circuitry should be construed to have two functions: (1) to produce an electroshock signal and (2) to respond to a command signal. Radio Systems further contends that this claim language is clear and unambiguous, and that resort to the specification to redefine the phrase is unnecessary.

The Court finds that the specification supports the construction proposed by Tri-Tronics. The specification states that the invention is directed to "a collar-supported electroshock apparatus ." Col. 2, lines 56-62. It further states that "the dog trainer carries a transmitter capable of sending radio signals to a receiver unit ... to apply stimuli to the free moving dog." Col. 1, lines 16-19. The specification further states that the "RF receiver unit 2A (FIG.5) inside unit 2 produces electroshock voltages which are applied to electroshock electrodes 6 and 7." Col. 3, lines 22-24. Accordingly, it is **RECOMMENDED** that the phrase "supporting circuitry producing an electroshock signal in response to a command signal," be construed to mean circuitry within the collar-supported receiver unit that is responsive to a triggering signal to produce an electrical shock stimulus signal for application to the animal being trained.

d. "the improvement comprising"

The parties agree that Claim 4 is a Jepson claim. *See Ex parte Jepson,* 243 O.G. 525 (Ass't Comm'r Pat.1917). Accordingly, the parties agree that this phrase indicates that the features preceding such clause were already known in the art, and that the inventive improvement involves the addition thereto of the features enumerated after such transitional phrase. *See* Ethicon Endo-Surgery Inc. v. United States Surgical

Corp., 93 F.3d 1572, 1577 (Fed.Cir.1996).

e. "first and second electrodes attached to the receiver and extending toward the animal's body"

Tri-Tronics argues that this phrase of Claim 4 should be construed to mean first and second electrodes that are attached to the strap-mounted receiver of the control apparatus, and which extend toward the portion of the animal's body that is encircled by such strap, *e.g.,* a dog's neck.

Radio Systems, on the other hand, argues that this claim language is ambiguous and indefinite under 35 U.S.C. s. 112 because the term "the receiver" has no antecedent reference in the claim. Radio Systems contends that the specification implicitly states that "the receiver" is part of the circuitry referenced earlier in the claim that receives the "command signal," and is a structure mounted on the strap, but that the specification does not alter the ordinary meaning of the term "receiver" from the usual definition of a device receiving radio frequency signals. So construed, Radio Systems argues, the receiver is required to have attached thereto first and second electrodes which extend toward the animal's body.

The Court does not find this phrase to be ambiguous because the Court can determine the meaning of this phrase by reference to the specification. The specification explains that the receiver unit produces electroshock voltages that are applied "to electroshock electrodes 6 and 7." Col. 3, lines 22-24. The specification further states that "the bases of electrodes 6 and 7 ... are threaded onto conductive studs connected to the outputs of receiver unit 2A." Col. 3, lines 26-30. The specification further states that partially insulated electrodes connected to the receiver unit "extend a sufficient distance beyond the insulation toward the neck of the dog." Col. 2, lines 63-68.

Accordingly, it is **RECOMMENDED** that the phrase "first and second electrodes attached to the receiver and extending toward the animal's body" be construed to mean first and second electrodes that are attached to the strap-mounted receiver of the control apparatus, and which extend toward the portion of the animal's body that is encircles by such strap, *e.g.,* a dog's neck.

f. "each of the first and second electrodes including an elongated conductive probe connected to the control apparatus to receive the electroshock signal"

Tri-Tronics contends that this phrase of Claim 4 should be construed to mean that the animal control apparatus includes two electrodes, and that each such electrode includes an elongated central, electrically-conductive region connected to the strap-mounted control device for receiving an electroshock signal to be applied to the dog or other animal.

Radio Systems argues that this phrase is ambiguous and indefinite under 35 U.S.C. s. 112 because the term "conductive probe" is not referenced or described in the written description of the invention and is therefore indefinite. Radio Systems further argues that the phrase that Tri-Tronics asks the Court to adopt, "central, electrically-conductive region" is not used in the written description of the invention, and no such "region" is disclosed in the patent drawings; thus, Radio System contends, it would be improper to read this language into the claim. With respect to the term "elongated conductive probe," Radio Systems argues that this term would more reasonably be construed as being a descriptive phrase which requires the body of the electrode to be elongated, *i .e.,* have a length greater than its diameter. Radio Systems argues that this claim language is also indefinite because it speaks of the elongated conductive probe being connected to the "control apparatus" when the "control apparatus" is named as the entire device of which the "probe" is referenced as a component. Radio Systems argues that the electrodes can be construed as being attached to the receiver,

and therefore, the language would more properly be construed to require first and second electrodes having elongated bodies which are attached to the receiver/circuitry.

The Court finds that the written description and patent drawings sufficiently describe this limitation. The specification explains that the RF receiver unit produces electroshock voltages that are applied "to electroshock electrodes 6 and 7." Col. 3, lines 22-24. The specification further explains that electrodes 6 and 7 have upper ends protruding above the upper ends of plastic insulators 4 and 5, respectively. *See* col. 5, lines 7-11. These elongated protruding "upper ends" are also evident in the patent drawings. *See* Figs. 1, 2, 3, and 6. Accordingly, it is **RECOMMENDED** that the phrase "each of the first and second electrodes including an elongated conductive probe connected to the control apparatus to receive the electroshock signal" be construed to mean that the animal control apparatus includes two electrodes, and that each such electrode includes an elongated central, electrically-conductive region connected to the strap-mounted control device for receiving an electroshock signal to be applied to the dog or other animal.

g. "and an insulator surrounding a portion of that electrode"

Tri-Tronics contends that this phrase should be construed to mean that each of the elongated conductive probes is at least partially surrounded by a non-conductive insulator member. Radio Systems, on the other hand, argues that this language should be construed to mean that the insulator surrounds a portion of the length of the electrode. At the *Markman* hearing, the parties agreed that this phrase of Claim 4 should be construed to mean an insulator that fully surrounds a portion of the length of the electrode. Accordingly, it is **RECOMMENDED** that "and an insulator surrounding a portion of that electrode" be construed to mean an insulator that fully surrounds a portion of the length of the electrode.

h. "an end portion of that electrode extending only sufficiently far beyond the insulator to both ensure consistent electrical contact of that electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus between the first and second electrodes through the animal's fur when wet"

Tri-Tronics contends that this phrase of Claim 4 should be construed to mean that the end portion, or tips, of the conductive probe portions of the electrodes should extend above insulators 4 and 5; that the conductive tips of the electrodes extend significantly more than just merely scarcely protruding from the insulators, and extending at least halfway (or 50 mils) toward the length ("approximately 100 mils") described in regard to the preferred embodiment; and that the exposed tips of the conductive electrodes do not extend significantly more than 250 mils beyond the surrounding insulation. At the *Markman* hearing, Tri-Tronics conceded that the figure of 50 mils asserted in its proposed construction was an arbitrary figure, and it proposed instead that the Court adopt a construction that is not limited by any particular numerical limitations. However, Tri-Tronics did not offer such an alternative construction.

Radio Systems argues that the doctrine of prosecution disclaimer bars the claim construction proposed by Tri-Tronics. Specifically, Radio Systems contends that the applicant expressly disclaimed a range of extension beyond approximately one-eighth to approximately one-quarter of an inch in order to avoid the prior art. Accordingly, Radio Systems argues that this language should be construed to require that each of the electrodes have an end portion that extends between approximately one eighth of an inch (.125 inches) and one fourth of an inch (.250 inches) beyond the associated insulator. With respect to the word "approximately," Radio Systems argues that this term should be construed to mean no more than 5% of the distance between 0 (no extension) and one eighth of an inch (.125 inches), thereby allowing for a range of extension between .119 inches and .260 inches beyond the insulator, increasing the total allowable range by

10%.

Tri-Tronics contends that the construction proposed by Radio Systems would essentially render the scope of Claim 4 identical to the scope of Claim 2, which expressly states that the "end portion of that electrode extending from approximately one-eighth to one-quarter of an inch beyond the insulator."

In a supplemental brief [Doc. 41], Radio Systems asserts that certain representations made by Tri-Tronics in the specification of U.S. Patent No. 6,907,844 ("the '844 Patent") further justify the application of prosecution disclaimer in this case. Specifically, Radio Systems relies upon the following excerpt from the '844 Patent (Col. 1, lines 36-58):

Commonly owned U.S. Pat. No. 5,193,484 discloses improved electrodes 6 and 7 having upper ends that protrude approximately 0.1 to 0.25 inches above the upper ends of plastic insulators 4 and 5, respectively. This structure effectively eliminates the large parallel resistance that would exist between the two un-insulated electrodes if the fur of the dog were wet and therefore also eliminates the shunting of a large portion of the electroshock current away from the neck of the dog that would occur if the fur of the dog were wet.... U.S. Pat. No. 5,193,484 discloses that for most short-haired dogs, the tips 6 and 7 should be provided so that they extend approximately 100 mils (0.1 inches) above the insulators 4 and 5, effective electroshock stimulus can be applied to the dog's neck regardless of whether the dog is dry or soaking wet or swimming in water, and for long-haired dogs, the tips 6 and 7 should extend as much as about one-fourth of an inch above the insulators.

[Doc. 41 Ex. A]. Radio Systems argues that this statement appears to reflect Tri-Tronics's understanding of the scope of the claims of the '484 Patent before being motivated by the present litigation to expand the scope of such claims. Further, Radio Systems argues that this statement is a clear representation to the PTO that the '484 Patent is limited to electrodes having conductive portions extending between approximately 0.1 and 0.25 inches above the upper ends of the insulators. Radio Systems argues that this statement should be viewed at least as an admission against interest that the scope of Claim 4 of the '484 Patent is limited to electrodes having conductive portions extending between approximately 0.1 and 0 .25 inches above the upper ends of the insulators.

In response to this supplemental filing, Tri-Tronics argues that the Court should focus on the intrinsic record of the '484 Patent in construing the disputed claims, and that the '844 Patent, which is not part of the intrinsic record of the '484 Patent and does not share a common chain of prosecution with the same, should therefore be disregarded. Even if the '844 Patent were considered, Tri-Tronics argues that the quoted language characterizes the *disclosure* of the '484 Patent, not the proper scope of its claims. Accordingly, Tri-Tronics argues that the '844 Patent evidence relied upon by Radio Systems should not be considered by the Court.

Under the doctrine of prosecution disclaimer, "[w]hen the patentee makes clear and unmistakable prosecution arguments limiting the meaning of a claim term in order to overcome a rejection, the courts limit the relevant claim term to exclude the disclaimed matter." Sandisk Corp. v. Memorex Prods., Inc., 415 F.3d 1278, 1286 (Fed.Cir.), *cert. denied,* 546 U.S. 1076, 126 S.Ct. 829, 163 L.Ed.2d 707 (2005). "[A]rguments made during prosecution regarding the meaning of a claim term are relevant to the interpretation of that term in every claim of the patent absent a clear indication to the contrary." Southwall Technologies, Inc. v. Cardinal IG Co., 54 F.3d 1570, 1579 (Fed.Cir.1995). The doctrine of prosecution disclaimer "preclud[es] patentees from recapturing through claim interpretation specific meanings

disclaimed during prosecution." Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1323 (Fed.Cir.2003). It also "promotes the public notice function of the intrinsic evidence and protects the public's reliance on definitive statements made during prosecution." *Id*. To be valid, however, a disclaimer must be "clear and unmistakable"; prosecution disclaimer does not apply "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." Sandisk, 415 F.3d at 1287.

To determine whether the scope of this claim has been effectively limited by an express disavowal of scope during the prosecution, the Court turns to the prosecution history of the '484 Patent. The prosecution history is admittedly complex and lengthy, with multiple ancestor patent applications leading up to the patent application that ultimately resulted in the '484 Patent being issued.

The initial patent application in the history was Patent Application No. 06/935,501 ("the '501 application"), which was filed on November 26, 1986, and set forth two claims. Claim 1 included a limitation that the end portion of the electrode extended from approximately one-eighth to one-quarter of an inch beyond the insulator. The examiner rejected both claims under 35 U.S.C. s. 103 as being obvious based on U.S. Patent No. 4,794,682 issued to Gonda ("the '682 Gonda Patent") in view of U.S. Patent No. 3,509,693 issued to French ("the '693 French Patent"), and under the second paragraph of 35 U.S.C. s. 112 as being indefinite. [Doc. 26 Appx. A at 27-31]. In response to this Office Action, the applicant's attorney argued that the insulators of the French reference were for a purpose other than preventing shunting of electroshock currents, and argued that the applicant's own prior devices cited in the application were more relevant prior art than the French reference. [Id. at 34-38]. Specifically, the application states that the closest prior art has electrodes consisting of units in which the end of the electrodes "scarcely protrude from the upper ends of the plastic insulators 4 and 6." [Id. at 19]. The applicant further moved to amend Claim 1 in order to "correct the indefiniteness pointed out by the examiner and to further distinguish the invention from the references." [Id. at 34]. The examiner issued a Final Office Action, reiterating the previous rejections. [Id. at 39-42].

The applicant responded by filing a continuing application, which became U.S. Patent Application No. 07/235,784 ("the '784 application"). The examiner rejected both claims under the doctrine of obvious-type double patenting, under 35 U.S.C. s. 103 as being obvious based on the '682 Gonda Patent and under the second paragraph of 35 U.S.C. s. 112 as being indefinite. [*Id*. at 48-52]. The applicant filed a preliminary amendment amending Claim 1 to clarify the function of the insulators. [*Id*. at 53-65]. In so doing, the applicant's attorney argued that "[t]he prior references do not recognize that providing the insulators 4 and 5 *in combination with* providing the correct *amount of extension of the electrodes beyond the insulators is critical to preventing electrical shunting* by wet animal fur *while* providing adequate electrical electrode-to-skin contact on a collar mounted device." [*Id*. at 58] (emphasis in original). In further support of the amendment, the applicant submitted the declaration of Gregory J. Farkas ("Farkas Declaration"), then Engineering Manager at Tri-Tronics. In his declaration, Mr. Farkas stated, in pertinent part, that the claimed invention "distinguishes over the closest prior electrode ... only in that the electrode tips extend approximately one eighth to one fourth of an inch beyond the end of the insulators, rather than being flush with the ends of the insulators." *Id*. at 63.FN5

FN5. Radio Systems contends that this description of the prior art constitutes a misrepresentation; however, this is not an allegation that the Court will address in this opinion.

Mr. Farkas further stated as follows:

8. The Assignee's closest prior electrodes described on page 15, line 13 et seq. of the above patent application resulted in inconsistent electrical contact to the skin of the dogs' necks and reduced the effectiveness of training using remote electroshock systems.

9. The Assignee and inventor were well aware of the problems, as described on page 15 of the above identified application and had a strong need to find a solution to the problem for approximately three years after the insulated electrodes with flush electrode tips were introduced to the market. Only after three years of effort by the inventor and others attempting to understand the problem and solve it did the inventor arrive at the new structure, with the electrodes protruding one eighth to one fourth of an inch beyond the end of the insulators.

10. It was certainly not obvious to me to modify the earlier structures to provide the new one now claimed.

[*Id*. at 63-64]. A Final Office Action was issued in the '784 application withdrawing the double patenting rejection as improper but maintaining the rejection under 35 U.S.C. s. 103. [*Id* . at 66-69.]. In response to this Final Office Action, the applicant further amended Claim 1 to include the diameter of the electrode tips and cancelled Claim 2. [*Id*. at 70-75.]. The examiner rejected this amended claim and refused to enter the amendment. [*Id*. at 76].

In response to the final rejection of the '784 application, the applicant filed a continuing application, U.S. Patent Application No. 07/463,359 ("the '359 application"). The examiner also rejected the claims of the '359 application under 35 U.S.C. s. 103 as being obvious based on the '682 Gonda Patent. [*Id*. at 81-86].

As a substantive response to the Final Office Action in the '359 application, the application filed a continuing application, U.S. Patent Application No. 07/578,562 ("the '562 application"), along with a preliminary amendment cancelling the existing claims and adding a new claim that included the functional and dimensional limitations from previous amendments. The applicant relied upon the Farkas declaration, as well as the declaration Gerald J. Gonda ("Gonda Declaration"), the named inventor of the '484 Patent. [Id. at 91-136]. In the preliminary amendment, the applicant argued that "[t]he prior art clearly fails to recognize that the problems (which the invention solved) could possibly be solved by an electrode tip with a particular diameter and a *small range* of electrode tip extension beyond an otherwise fully insulated electrode shank." [Id. at 97-98] (emphasis added). The Gonda Declaration states as follows:

13. The insulated base of the closest prior art structure shown in Exhibit "A" effectively prevents shunting of current through wet fur of the dog from the shank of one electrode to the other. The flush exposed electrode structure was selected as a compromise. Quite a variety of different structures, including electrode nipples extending more than one quarter of an inch beyond a similar insulating collar such as B had been experimentally used, but had resulted in serious neck lesion problems on some dogs.

* * *

15. The electrode structure of Exhibit "A" resulted in a *new list of problems* and complaints by Tri-Tronics' customers. While some owners and trainers got effective performance with wet dogs, others experienced poor performance while the dog fur was dry, yet improved performance when the dog's hair was wet. Others experienced poor performance with dog's hair both wet and dry ....

[Id. at 128-29]. The Exhibit "A" referred to in the Gonda Declaration shows what is described as a "metal, slightly protruding contact," but no exact measurement is given. [Id. at 136].

The Gonda Declaration goes on to state, in pertinent part, as follows:

17. ... It was not at all apparent to me, any of Tri-Tronics' employees, or any of Tri-Tronics' complaining customers how to come up with a structure that 1) prevents resistive shunting of electrical stimulus current between the electrodes if the dog's fur is wet, 2) prevents neck lesions on the dog's neck due to contact with the electrode, and 3) does not require an excessively tight collar.

18. Nevertheless, **I continued my efforts, and eventually constructed insulated electrode structures such as those shown in Fig. 3 and Fig. 6 of the ['562] application, in which the diameter of the electrodes is approximately one-eight [sic] of an inch and the length of the nipple extension beyond the insulating base is also approximately one-eight [sic] of an inch and discovered that good electrical avoidance of excessive shunting of electrical current through wet fur, and that effective electrical contact to the neck of the dogs with both wet fur and dry fur occurred without excessive tightening of the collar.**

19. Tri-Tronics introduced the electrode structure of Figs. 3 and 6 of the present application on its products ...

The almost immediate effect was that essentially no more complaints were received from customers, and units returned for repair no longer contained customer-modified electrode tips. **I consider this to be a very surprising, dramatic benefit of getting the right range of values for the electrode tip extension and diameter.**

* * *

22. To me, it was a very surprising result that **a certain small range of electrode nipple extension dimension beyond an insulated base** and a particular diameter of the nipple extension could provide a solution to the serious problems of shunting through0 wet hair of dogs, the reluctance of dog owners to tighten collars beyond a certain degree on their animals, and the serious problems produced by various prior electrode tips that had been tried.

[Id. at 130-32] (emphasis added).

The examiner also rejected the new claim under 35 U.S.C. s. 103 as being obvious based on the '682 Gonda Patent. [Id. at 137-41]. In the appeal brief, the applicant argued that the new claim distinguishes over the Gonda reference by reciting "an end portion means of each of the first and second electrodes for extending only **sufficiently far, specifically approximately one-eighth to one-quarter of an inch,** beyond the insulator to 1) ensure consistent electrical contact of the first and second electrodes with the animal's skin without overtightening the strap, and 2) avoid substantial shunting of electrical stimulus current between the first and second electrodes through wet fur, the diameter of the end portion means of each of the first and second electrodes being approximately an eighth of an inch." [Id. at 151] (emphasis added). The applicant further argued that the selection of the recited electrode tip diameter and electrode tip extension beyond the insulators "would not have been obvious because the prior art contains no suggestion that electrode tip

diameter and electrode tip extension beyond the insulators 4 and 5 are 'result-effective' variables or critical variables." [Id. at 155].

Upon appeal, the examiner reconsidered the application and allowed the claims. Subsequently, United States Patent No. 5,099,797 ("the '797 Patent") issued. [Id. at 173-74].

A few days prior to the issuance of the '797 Patent, the applicant filed a continuing application, United States Patent Application No. 07/859,080 ("the '080 application"), from which the '484 Patent issued. [Id. at 175-77]. In a preliminary amendment, the applicant canceled the two original claims and replaced them with a single claim. [Id. at 178-229]. The applicant also resubmitted the Farkas and Gonda Declarations, as a well as a copy of the appeal brief from the prosecution of the '562 application with the preliminary amendment. The examiner rejected the original claims under the doctrine of obvious-type double patenting prior to the examiner receiving the preliminary amendment. [Id. at 230-33]. In response, the applicant filed an amendment adding two claims that were similar in scope to the cancelled claims and a third claim that appears originally numbered as Claim 6, but which eventually issued as the subject Claim 4. [Id. at 234-38]. In submitting the amendment, the applicant's attorney advised the examiner that "[n]ew Claim 6 [which ultimately issued as Claim 4 of the '484 Patent] is of slightly broader scope than [patent application] Claim 4 [which issued as Claim 2 of the '484 Patent] in that the language 'approximately one-eighth to one-quarter of an inch' has been replaced by 'only sufficiently far beyond the insulator to both ensure consistent electrical contact of the electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus current between the first and second electrodes through the animal's fur when wet.' " [Id. at 236-37]. All four claims were allowed without further argument, and the '484 Patent issued. [Id. at 242].

The Court finds that there was not a clear disavowal of scope of the limitation "only sufficiently far beyond the insulator to both ensure consistent electrical contact of that electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus between the first and second electrodes through the animal's fur when wet" during prosecution. This claim language was not present in the claims being prosecuted at the time of the Gonda and Farkas Declarations. At the time that the arguments and representations were made that the workable range was one-eighth to one-fourth of an inch, the relevant limitation at issue was the limitation set forth in what is now Claim 2, "the end portion of that electrode extending from approximately one-eighth to one-quarter of an inch beyond the insulator." Moreover, in submitting the amendment with the '080 application, the applicant explained that the language that is now part of Claim 4 was of a "slightly broader scope" than the limitations set forth in now what is Claim 2. The applicant further explained that the language "only sufficiently far beyond the insulator to both ensure consistent electrical contact of that electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus between the first and second electrodes through the animal's fur when wet" provided one skilled in the art with the criteria needed to determine a suitable length of electrode extension without undue experimentation. Obviously, the patent examiner agreed, and the claims were allowed to issue.

Furthermore, the Court does not find that the '844 Patent language submitted by Radio Systems in its supplemental filing serves to limit the scope of the claims in the '484 Patent. There has been no showing made that these patents share the same prosecution chain or otherwise related. Moreover, the quoted language refers merely to one disclosure of the '484 Patent and does not purport to define the entire scope of the '484 Patent claims. As such, the Court finds that this language does not constitute a disclaimer or even an admission by Tri-Tronics limiting the scope of the '484 Patent claims.

The Court agrees with Tri-Tronics that to adopt the construction proposed by Radio Systems would effectively render the scope of Claim 4 identical to the scope of Claim 2, which expressly claims an "end portion of that electrode extending from approximately one-eighth to one-quarter of an inch beyond the insulators." Pursuant to the doctrine of claim differentiation, there is a "rebuttable presumption that different claims are of different scope." Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1326 (Fed.Cir.2003). "To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant." Tandon Corp. v. U .S. Int'l Trade Comm'n, 831 F.2d 1017, 1023 (Fed.Cir.1987) (citing D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574 (Fed.Cir.1985)). Of course, the doctrine of claim differentiation "cannot alter a definition that is otherwise clear form the claim language, description, and prosecution history." O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1582 (Fed.Cir.1997); *see also* D.M.I ., 755 F.2d at 1574 n. 2 ("Claims are always interpretable in light of the specification that led to the patent."). "Whether or not claims differ from each other, one can not interpret a claim to be broader than what is contained in the specification and claims as filed." Tandon, 831 F.2d at 1024; *see also* Fantasy Sports Properties, Inc. v. Sportsline.com, Inc., 287 F.3d 1108, 1115-16 (Fed.Cir.2002) ("The doctrine of claim differentiation creates only a presumption that each claim in a patent has a different scope that can not broaden claims beyond their correct scope.") (quoting Kraft Foods, Inc. v. Int'l Trading Co., 203 F.3d 1362, 1368 (Fed.Cir.2000)).

Radio Systems argues that no other workable range was offered during the prosecution other than the one-eighth to one-quarter of an inch range. This arguments ignores, however, the language of the specification, which states that "improved electrodes 6 and 7 have been provided by causing their upper ends to protrude approximately 0.1 inches above the upper ends of plastic insulators 4 and 5, respectively." Col. 5, lines, 8-11. The specification goes on to state that the prior art has electrodes that "scarcely protrude" from the upper ends of the plastic insulators, but that this design created a problem in applying effective electrical stimulus "if the collar was less than quite tightly disposed about the dog's neck." Col. 5, lines 11-33. The specification states that this problem was solved, at least in the case of short-haired dogs, "by extending the tips 6 and 7 approximately 100 mils [0.1 inches] above the insulators 4 and 5 ...." Col. 5, lines 35-37.

The parties agree that to avoid substantial shunting, the exposed tips of the conductive electrodes do not extend significantly more than 250 mils (one-quarter of an inch) beyond the surrounding insulation. As the Court indicated earlier, Tri-Tronics conceded at the *Markman* hearing that the figure of 50 mils was an admittedly arbitrary figure to assert as the low-end of the electrode extension range, and Tri-Tronics urged this Court to adopt a construction without prescribing a strict numerical boundary. The Court finds that a construction without a strict numerical boundary would be appropriate in this case, and it is therefore **RECOMMENDED** that "an end portion of that electrode extending only sufficiently far beyond the insulator to both ensure consistent electrical contact of that electrode with the animal's skin without overtightening the strap and avoid substantial shunting of electrical stimulus between the first and second electrodes through the animal's fur when wet" be construed as the end portion, or tips, of the conductive probe portions of the electrodes extend above insulators 4 and 5 more than just merely scarcely protruding from the insulators, and that the exposed tips do not extend significantly more than 250 mils beyond the surrounding insulators so that constant electrical contact of the electrodes is ensured with the animal's skin without overtightening the strap and so that substantial shunting of electrical stimulation between the first and second electrodes through the animal's fur is avoided when the animal is wet.FN6

FN6. Any objections to this Report and Recommendation must be served and filed within ten (10) days

after service of a copy of this recommended disposition on the objecting party. Such objections must conform to the requirements of Rule 72(b), Federal Rules of Civil Procedure. Failure to file objections within the time specified waives the right to appeal the District Court's order. Thomas v. Arn, 474 U.S. 140, 106 S.Ct. 466, 88 L.Ed.2d 435 (1985). The district court need not provide *de novo* review where objections to this report and recommendation are frivolous, conclusive or general. Mira v. Marshall, 806 F.2d 636 (6th Cir.1986). Only specific objections are reserved for appellate review. Smith v. Detroit Federation of Teachers, 829 F.2d 1370 (6th Cir.1987).

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