United States District Court,
N.D. Illinois, Eastern Division.

MURATA MANUFACTURING CO., LTD,
Plaintiff.
v.
BEL FUSE INC., et al,
Defendants.

July 28, 2006.

Background: Holder of a patent which disclosed a modular jack with a printed circuit board containing a noise suppressing element in its housing brought suit against alleged infringers.

Holdings: On the parties' request for construction of terms of the patent, the District Court, Gottschall, J., held that:
(1) "modular jack" meant "the female portion of a modular connector in which wires of a circuit are connected at one end and into which a plug is inserted at the other end";
(2) "printed board" meant "a generally flat piece of material typically fabricated from insulating material that provides support and structural integrity for a plurality of electrically interconnected components comprising a circuit, with some or all of the conducting interconnection pattern formed on the board";
(3) "wire on the printed board" meant "a conductive metallic element interconnecting various regions, contributing to the interconnecting of various regions, on the printed board";
(4) "insulating housing" meant "a covering which has a high electrical resistance and which can serve to prevent a short circuit between components";
(5) "electronic element," meant "an electronic component";
(6) "suppressing" meant "eliminating or attenuating"; and
(7) "containing" meant "including as an component."

Ordered accordingly.

5,069,641. Construed.

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MEMORANDUM OPINION AND ORDER

GOTTSCHALL**, District Judge.**

Murata Manufacturing Co., Ltd. ("Murata") sued Bel Fuse Inc., Bel Fuse Ltd., Bel Stewart Ltd., and Bell

Connector Inc. (collectively "Bel Fuse") for infringement of United States Patent No. 5,069, 641 ("the '641 Patent"). Bel Fuse has asserted the defenses of non-infringement, invalidity, and inequitable conduct. The parties have asked the court to construe seven terms in the '641 Patent. The court adopts the constructions of those terms as discussed in detail below.

I. Background

The '641 Patent, entitled "Modular Jack," discloses a modular jack which has a printed circuit board containing a noise suppressing element in its housing. Such jacks can be used in various applications including telephone and data communications. Because the noise suppressing element is contained within the housing, the invention has the advantage of being more compact than prior art jacks in which the noise suppressing element is placed outside the housing. In addition, the jack of the '641 Patent has the advantage over some prior art jacks of being more cost effective because the contactor, noise suppressing element, and terminal can all be plated separately and with different metals. FN1 The present invention also has the advantage over some prior art jacks in that the pitch among the terminals can be set to the ordinary pitch of 1.02 mm or some other value. FN2

FN1. The '641 Patent describes a prior art jack disclosed in U.S. Patent No. 5,015,204 ("the '204 Patent"). The '204 Patent discloses a modular jack in which the coil, contactor, and terminal are a single unit which must be plated together, resulting in the unnecessary plating of the coil. One of the advantages of the '641 Patent is that this unnecessary cost can be avoided because the noise suppressing element, contactor, and terminal are all separate elements.

FN2. The '641 Patent states that the '204 Patent has a pitch among the terminals of more than 1.02 mm, requiring a newly designed circuit board. As shown in Figure 10 of the '641 Patent, pitch means, in laymen's terms, the spacing between the centers of the terminals.

Murata asserts that Bel Fuse has infringed claims 1, 2, 4, and 6 of the ' 641 Patent. These claims state:

1. A modular jack to be mounted on a circuit board, said modular jack comprising: a printed board containing an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a wire on the printed board; and

an insulating housing for encasing the printed board.

2. A modular jack as claimed in claim 1, wherein the noise suppressing electronic element is an array of common mode choke coils.

4. A modular jack as claimed in claim 1, wherein the noise suppressing electronic element is a chip capacitor.

6. A modular jack as claimed in claim 1, wherein the interior of the housing is divided into a first chamber in which the printed board is set and a second chamber to which the contactor is extended, and the terminal is protruded outside the housing from the first chamber.

The parties previously filed claim construction briefs, asking the court to construe nineteen terms. Because the parties had not briefed all nineteen (leading the court to suspect that construction of all nineteen terms was unnecessary), and because the initial claim construction briefing was completed prior to the Federal Circuit's en banc decision in Phillips v. AWH Corp., 415 F.3d 1303 (Fed.Cir.2005), the court directed the parties to submit additional briefing.

Given a second try, the parties were indeed able to narrow the disputed terms, and have informed the court that they now dispute the proper construction of seven terms, and that the construction of these terms is relevant to the issues of infringement, validity, and inequitable conduct.

II. Discussion

A. *The Standard for Claim Construction*

[1] The second paragraph of Section 112 of the Patent Act, 35 U.S.C. s. 112, states: "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." The claims define the patentee's right to exclude. *See, e.g.,* Metabolite Labs., Inc. v. Laboratory Corp. of America Holdings, 370 F.3d 1354, 1373 (Fed.Cir.2004).

[2] [3] [4] Claim construction is a question of law for the court to decide. *See* Markman v. Westview Instruments, Inc., 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The Federal Circuit sitting en banc recently clarified the appropriate methodology for a court to use when performing claim construction. Phillips v. AWH Corp., 415 F.3d 1303 (Fed.Cir.2005) (en banc). The words of the claims in a patent are to be given the ordinary and customary meaning that would have been attributed to them by a person of ordinary skill in the art at the time the invention was made. Id. at 1312-13. The person of ordinary skill in the art is deemed to have read the term in the context of the entire patent, including the claims themselves, the specification, and the prosecution history. Id. at 1313. The claims, specification, and prosecution history are so-called intrinsic evidence.

[5] [6] Extrinsic evidence is everything "external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." Id. at 1317. Review of technical dictionaries and treatises can be helpful to the court in understanding the technology of the invention and can assist the court in determining the meaning of terms to those of skill in the art of the invention. Id. at 1318. Where extrinsic evidence conflicts with the intrinsic evidence of the patent, however, the intrinsic evidence controls. Id.

[7] In considering the evidence, both intrinsic and extrinsic, the court may consider the evidence is whichever order is appropriate: "The sequence of steps used by the judge in consulting various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law." Id. at 1324. Thus, the court approaches the construction of the disputed terms in the '641 Patent with this methodology in mind.

B. *Disputed Terms*

The parties have asked the court to construe seven terms: FN3 "modular jack," "printed board," "wire on the printed board," "insulating housing," "electronic element," "suppressing," and "containing." The court addresses each disputed term below.

FN3. A s noted in this court's June 29, 2006 order, Bel Fuse included in its responsive brief some constructions that were different from those constructions asserted in the Joint Claim Construction Chart. Additionally, in its responsive brief, Bel Fuse chose not to dispute certain terms that it had previously disputed in the Joint Chart. In particular, Bel Fuse had previously asserted as part of its proposed construction for "modular jack" that it was limited to use in a modular telephone connection; Bel Fuse has since abandoned this limitation. Bel Fuse has also abandoned its dispute as to "electrically connected" and

"noise." Thus, the court will not consider these terms.

1. "*Modular Jack*"

[8] The term "modular jack" is used in the claims of the '641 patent as follows:

1. A *modular jack* to be mounted on a circuit board, said *modular jack* comprising:

a printed board containing an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a wire on the printed board; and

an insulating housing for encasing the printed board.

2. A *modular jack* as claimed in claim 1, wherein the noise suppressing electronic element is an array of common mode choke coils.

4. A *modular jack* as claimed in claim 1, wherein the noise suppressing electronic element is a chip capacitor.

6. A *modular jack* as claimed in claim 1, wherein the interior of the housing is divided into a first chamber in which the printed board is set and a second chamber to which the contactor is extended, and the terminal is protruded outside the housing from the first chamber.

The parties agree that "modular" refers to "the geometric configuration of jacks and their corresponding plugs, such as the RJ-11 series, RJ-45 series and the like, which are now commonly seen on telephony apparatus, computer modems, switches, and routers, and similar equipment." Murata's Opening Brief, at 12; Bel Fuse's Responsive Brief, at 25. Murata argues that "jack" should be construed as "a socket to which wires of a circuit are connected at one end and into which a plug is inserted at the other end." Murata's Opening Brief, at 12. Bel Fuse argues that a "jack" should be construed as "a female connector to which wires of a circuit are connected at one end and into which a plug is inserted at the other end." FN4 Bel Fuse's Responsive Brief, at 25. Thus, the parties dispute whether a "jack" is more properly characterized as a "socket" or a "female connector." The parties have not explained to the court why construing somethingas a "socket" as opposed to a "female connector" is a distinction with a difference; indeed, their briefs indicate that both parties understand the meaning of "jack" as it is used in the ' 641 Patent. Nevertheless, the court will consider which is the more appropriate term.

FN4. Bel Fuse's proposal actually states that a "modular jack" should be construed as "a *modular* female connector to which wires of a circuit are connected at one end and into which a plug is inserted at the other end." Bel Fuse's Responsive Brief, at 25. Since the parties agree on the meaning of "modular" and dispute only the construction of the term "jack," for simplicity's sake, the court has removed the term "modular" from Bel Fuse's proposed construction.

Murata argues that "female connector" is too general a term because the ' 641 Patent does not claim female connectors generally; it claims a modular jack. Instead, Murata argues that "socket" is a more specific term that is consistent with the intrinsic record FN5 of the ' 641 Patent. Dr. David Hughes ("Dr.Hughes"),

Murata's expert, opined that the word "jack" means "a socket to which wires of a circuit are connected at one end and into which a plug is inserted at the other end." Hughes' Expert Report at 4, Ex. 2 to Murata's Opening Brief. He based his construction on a definition from Rudolf F. Graf, The Modern Dictionary of Electronics 529 (6th ed. 1984) ("The Modern Dictionary of Electronics") ("1. A socket to which the wires of a circuit are connected at one end, and into which a plug is inserted at the other end."). Id. Dr. Hughes also opined that the "plug" is usually thought of as the "male portion of the assembly," and the "jack" is usually thought of as the "female portion." Id.

FN5. In evaluating the intrinsic evidence, the court notes that while the parties have provided the prosecution history of the '641 Patent, that history provides no assistance in the task of claim construction. *See* Ex. 11 to Bel Fuse's Responsive Brief. The patent application was filed on January 30, 1991. On May 30, 1991, the examiner held an interview with the applicant by telephone. According to the examiner's summary, in that interview, the examiner and applicant reached an agreement to amend claim 5. Subsequently, the examiner issued a notice of allowability along with an examiner's amendment. That amendment changed "the pitch among the terminals" in claim 5 to "the pitch among a plurality of terminals" and also deleted "the" from "among the contractors on the printed board."

Thus, the patentee made no representations during the prosecution of the ' 641 Patent about the constructions of the terms at issue here. Indeed, the claims at issue in this case (1, 2, 4, and 6) were issued without amendment.
In support of its position that "female connector" is too broad a term, Murata cites the deposition testimony of Albert Willette ("Willette"), who is apparently Bel Fuse's expert. Willette testified that there are other kinds of female connectors that are not jacks. Willette Dep., 81:5-15, Ex. 19 to Murata's Opening Brief. Willette also testified that a jack and plug together form a connector. Id. at 78:7-12. Murata also cites the specification of the '641 Patent which states: "The present invention relates to a modular jack in a modular connector...." '641 Patent, col. 1, ll. 6-7. According to Murata, adopting Bel Fuse's construction would cause this sentence to be nonsensical, reading "a modular connector in a modular connector." The court notes that Murata is incorrect; Bel Fuse's construction would cause the specification to read, "a female modular connector in a modular connector." Given the fact that Willette testified that the jack and plug together form a connector, testimony that Murata cites, the court finds that this substitution makes sense.

Additionally, it appears that Bel Fuse's proposed construction would not cause the claims of the '641 Patent to read on all types of modular connectors. Instead, it would describe only the female portion of a connector into which a plug is inserted. This appears to be an appropriately narrow construction of a "jack." Other references in the same art area show that jacks are often described as "connectors." *See* U.S. Patent No. 4,772,224 (titled "Modular Electrical Connector" and describing a "modular jack"), Ex. 8 to Bel Fuse's Responsive Brief; U.S. Patent No. 4,799,901 (referring to jacks as "connector subassemblies" and stating "U.S. Patent No. 4,726,638 discloses a transient suppression assembly for retrofitting existing *electrical connectors, such as telephone jacks* ") (emphasis added), Ex. 10 to Bel Fuse's Responsive Brief; U.S. Patent No. 4,878,848, col. 2, ll. 40-42 ("The adapter system comprises a modular connection means, such as a modular jack, and a housing structure connected to the modular jack."), Ex. 12 to Bel Fuse's Responsive Brief.

Thus, the court finds that a jack and plug together form a modular connector. Indeed, Murata cites Willette's deposition testimony in which he testified that a jack and plug together form a modular connector. Willette Dep., 78:9-10. Murata bases its proposed construction of a "jack" as a "socket" on only a single dictionary definition in the Modern Dictionary of Electronics FN6 and Dr. Hughes' expert report which refers only to that same definition without further explanation. The Federal Circuit has stated that "conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court." Phillips, 415 F.3d at 1318. While Dr. Hughes' assertion is not wholly unsupported (it refers to a dictionary definition), it is only marginally useful to the court because it provides no explanation as to why the particular definition was chosen or why it is consistent with the view of a person of ordinary skill in the art.

FN6. Other definitions in this same dictionary refer to a jack as a "receptacle." The Dictionary of Modern Electronics 529 ("jack": "3. A receptacle into which a mating connector may be plugged. 4. The receptacle that accepts a plug, specifically a phone plug."). Yet neither party has explained to the court why "receptacle" is not also an appropriate construction for jack.

After reviewing all of the evidence, both intrinsic and extrinsic, the court finds that adopting a construction which characterizes a "modular jack" as "the female portion of a modular connector" is consistent with the intrinsic evidence, and reflects the view of a person of ordinary skill in the art. Adding the restriction "in which wires of a circuit are connected at one end and into which a plug is inserted at the other end" appropriately narrows the definition such that it is clear that a "jack" does not encompass all female connectors. Additionally, the parties have agreed that the additional modifier "modular" restricts the construction of the claim "modular jack" to certain configurations. Thus, the court construes the term "modular jack" as "the female portion of a modular connector in which wires of a circuit are connected at one end and into which a plug is inserted at the other end."

2. "Printed board" and "Wire on a printed board"

[9] [10] The parties have asked the court to construe "printed board" and "wire on a printed board." Because construction of these two terms involves the resolution of a single disputed issue, namely, whether a wire on the printed board must be printed or can be discrete, the court will address the construction of these terms together.

Claim 1 of the '641 patent uses these terms as follows:

1. A modular jack to be mounted on a circuit board, said modular jack comprising:

a *printed board* containing an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a *wire on the printed board;*

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a *wire on the printed board;* and

an insulating housing for encasing the *printed board*.

As to "printed board," Murata proposes the following construction:

A generally flat piece of material typically fabricated from insulating material that provides support and structural integrity for a plurality of interconnected components comprising a circuit. In printed circuit board technology, some or all of the conducting interconnection pattern is formed on the board.

Murata's Opening Brief, at 17. Bel Fuse proposes:

A flat board made of nonconducting material on which electronic components are adapted to be mounted and electrically connected by a pattern of conductive metal pathways or traces that are printed on the surface of the printed board.

Bel Fuse's Responsive Brief, at 11. Thus, the parties' primary dispute as to the construction of "printed board" is whether all of the wires on the printed board must be printed.

As to "wire on the printed board," Murata proposes: "A conductive metallic element interconnecting various regions, or contributing to the interconnecting of various regions, on the printed board." Murata's Opening Brief, at 20. Bel Fuse proposes: "A conductive metal pathway or trace formed (printed) on a surface of a printed board for electrically connecting components held on the board." Bel Fuse's Responsive Brief, at 11. As with "printed board," the parties dispute whether a "wire on the printed board" must be a printed wire.

The court begins with an examination of the specification of the '641 patent. As part of the summary of the invention, the specification states: "A contactor for contacting with a plug and a terminal for contacting with a circuit board are electrically connected with the electronic element by wires on the printed board." '641 Patent, col. 2, ll. 1-4. The specification also describes three preferred embodiments. As to the first embodiment, it states that "the printed board 30 has *printed* wires 33 and 34 on both sides," id. at col. 3, ll. 23-24 (emphasis added), and "[i]n order to increase and decrease the number of signal circuits, it is only required to change patterns of the wires 33 and 34 on the printed board 30." Id. at col. 3, ll. 59-62. "Design of the wires 34 on the printed board 30 is comparatively free, and the pitch P among the holes 32, that is, the pitch among the terminals 36 can be set to 1.02 mm which is the pitch of an ordinary circuit board on which the modular jack is mounted." Id. at col. 4, ll. 11-16. Likewise, the second and third embodiments disclose printed wires. *See* id. at col. 4, ll. 22-23 ("printed wires 44 and 45 on the board 41 are connected to chip inductors 40."); col. 4, ll. 37-39 ("printed wires 54 and 55 and an earth electrode 57 on the board 51 are connected to the [chip] capacitors 50."). Finally, the specification states:

Although the present invention has been described in conjunction with the embodiments above, it is to be noted that various changes and modifications are apparent to those who are skilled in the art. Such changes and modification are to be understood as included within the scope of the present invention defined by the appended claims.

Id. at col. 4, ll. 50-56.

Thus, the preferred embodiments in the specification of the '641 teach only printed wires on the printed board, but the specificationdoes not expressly exclude the use of discrete wires and states that the invention includes variations to the preferred embodiments that would be apparent to persons of ordinary skill in the art. The question then becomes whether a person of ordinary skill in the art would recognize that some of the printed wires could be replaced by discrete wires.

Murata argues that jumper wires are well-known in the art; jumper wires create "a direct electrical connection, which is not a portion of the conductive pattern, between two points in a printed circuit." The Modern Dictionary of Electronics 532. Murata also cites a photo of an IBM circuit board which includes a jumper wire and the NASA Workmanship Standards which provide standards for the use of jumper wires on printed boards. Exs. 26 and 30 to Murata's Opening Brief. Because the use of jumper wires is well-known in the art and the patent does not specifically exclude them, Murata argues that "printed board" as used in claim 1 of the '641 patent can include discrete wires as well as printed wires and that "wire on a printed board" as used in claim 1 can be either a discrete wire or a printed wire.

Bel Fuse argues that a "wire on a printed board" as used in claim 1 includes only printed wires. Bel Fuse relies on the description of the preferred embodiments in the specification of the '641 Patent, which, as discussed above, include only printed wires. Bel Fuse also argues that one of the objects of the invention of the '641 Patent is that "[a] change in wire patterns on the printed board meets an increase of the required number of signal circuits, thereby never requiring more space." '641 Patent, col. 2, ll. 15-18. Because wire patterns on a printed board are composed of printed wires, Bel Fuse argues that, to achieve this advantage, the invention must include only printed wires. However, Bel Fuse has not explained why this advantage could not be achieved if a discrete wire was used for a connection while the remaining pattern was composed of printed wires, and Bel Fuse does not argue that discrete wires on the type of printed board

used in the '641 patent are not known in the art.

Significantly, limiting a "printed board" to one with only printed wires or traces and a "wire on a printed board" to a printed wire would restrict the interpretation of these terms to the preferred embodiments, despite language in the specification saying that modifications apparent to a person of ordinary skill in the art are not excluded. Murata has provided evidence that the use of jumper wires is known in the art, and Bel Fuse has provided the court with no reason to believe that such the modification of using a jumper wire(s) would not have been apparent to a person of ordinary skill in the art. Thus, the court finds that adopting a construction that excludes discrete wires would improperly import a limitation from the specification into the claims. Phillips, 415 F.3d at 1323 (stating that courts should avoid "reading limitations from the specification into the claim"). The court construes "printed board" as "a generally flat piece of material typically fabricated from insulating material that provides support and structural integrity for a plurality of electrically interconnected components comprising a circuit, with some or all of the conducting interconnection pattern formed on the board," and the court construes "wire on the printed board" as "a conductive metallic element interconnecting various regions, contributing to the interconnecting of various regions, on the printed board."

3. "***Insulating housing***"

[11] The term "insulating housing appears in claim 1 of the '641 patent as follows:

1. A modular jack to be mounted on a circuit board, said modular jack comprising:

a printed board containing an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a wire on the printed board; and

an *insulating housing* for encasing the printed board."

Murata argues that "insulating housing" means "a covering which has a high electrical resistance and which can serve to prevent a short circuit between components." Murata's Opening Brief, at 22. Bel Fuse argues that "insulating housing" means "an enclosure for separating a part or mechanism from an electrical conductor by means of an electrical nonconductor to prevent transfer of electricity between the part or mechanism and the conductor." Bel Fuse's Responsive Brief, at 29. The primary difference between the proposed constructions is that Murata's would require the housing to be made of non-conductive material while Bel Fuse's would not require non-conductive material as long as the housing still performed the function of insulating.

Again, the court begins with a review of the specification of the '641 Patent. When describing the first preferred embodiment, the specification states: "[A] modular jack has an insulating housing 12 which comprises a base 14 and a lid 16 which are engaged by interlocked coupling. Both the base 14 and the lid 16 are made of an insulating material such as plastic." '641 Patent, col. 3, ll 3-7. The specification is otherwise silent on the insulating properties of the housing.

Murata argues that the housing must be made of insulating material because if it were made of conductive material, the preferred embodiment would be inoperable. *See, e.g.,* Pfizer, Inc. v. Teva Pharmaceuticals, USA, Inc., 429 F.3d 1364, 1374 (Fed.Cir.2005) ("A claim construction that excludes a preferred embodiment is rarely, if ever, correct.") (internal quotations and punctuation omitted). As shown in Figure 1

of the '641 patent, the contactor 35 and terminals 36 are both in direct contact with the housing. Thus, if the housing were made of conductive material, the contactor and terminals would short circuit with the housing, rendering this embodiment inoperable. However, the court disagrees that Bel Fuse's proposed construction would exclude the preferred embodiment because Bel Fuse's construction permits, but does not require, the housing to be made of conductive material. Because under Bel Fuse's proposed construction the housing could be made of non-conductive material, the preferred embodiment would still fall within the scope of the claim 1.

That being said, the court nevertheless finds that a person of ordinary skill in the art would find that an "insulating housing" as that term is used in claim 1 of the '641 Patent must be made of insulating material. Bel Fuse spends much of its brief on this term arguing the merits of its inequitable conduct defense FN7 and gives short shrift to explaining how a person of ordinaryskill in the art would have interpreted this term.

FN7. In briefing the construction of several of the disputed terms, Murata has suggested what it believes are Bel Fuse's motives for offering its proposed constructions, and Bel Fuse has argued (at least in part) the merits of some of its defenses. The court notes that it has not considered the merits of those defenses or the impact of the court's claim construction on those defenses in reaching its decision.

Bel Fuse's only argument of substance is a grammatical one. Citing The English Language Center of the University of Victoria's ("the Center's") website, Bel Fuse argues that "insulating" is a so-called "purpose adjective." The Center's website states that "a purpose adjective describes what something is used for" and that such adjectives end in "-ing," such as "sleeping" in sleeping bag or "roasting" in roasting tin. Ex. 32 to Bel Fuse's Responsive Brief. The Center states that a "material adjective describes what something is made from," such as wooden, metal, cotton, or paper. Id. According to Bel Fuse, "insulating" as used in the claim term "insulating housing" is a purpose adjective and not a material adjective because it is a modified form of the verb "to insulate" with an "-ing" ending. Thus, Bel Fuse argues that as a purpose adjective, an "insulating housing" refers to "a housing for the purpose of insulating." Bel Fuse's Responsive Brief, at 29.

Even if the court accepts Bel Fuse's grammatical argument, however, the court must still reject Bel Fuse's proposed construction. The court fails to see how a housing made of conductive material could be used for the purpose of insulating. Bel Fuse posits that the housing can still be insulating if separated from the components by a non-conductive insert or by air. However, in those cases, it seems that the insert or the air has the purpose of insulating, not the housing. For the housing to have the purpose of insulating, it must perform that function itself, and the only way it can do so is to be made from insulating material.FN8 Thus, the court finds that the "insulating housing" as used in claim 1 of the ' 641 Patent must be made of insulating material. This limitation is supported both by the language of the claim which requires an *insulating* housing and by the specification, which states that the housing of the preferred embodiment is made of an insulating material such as plastic. Accordingly, "insulating housing" means "a covering which has a high electrical resistance and which can serve to prevent a short circuit between components."

FN8. The court recognizes that a housing could serve the purpose of insulating by physically separating the conductive components, such that the space between them (i.e., air) insulates them. However, it is difficult to see how such a configuration would be operable in a modular jack. Bel Fuse has not provided the court with any examples of modular jacks which show a housing made from conductive material. Instead, as relevant to its inequitable conduct defense, it cites U.S. Patent No. 4,789,847 which discloses a filter connector. Claim 1 of that patent includes the elements of a "conductive shell" and an "insulating insert."

Bel Fuse has not provided any suggestion that a person of ordinary skill in the art would interpret "insulating housing" in the modular jack of the ' 641 Patent as being made of conductive material, and has not shown that a modular jack with a conductive housing would even be operable. Under claim 1 of the '641 Patent, the modular jack includes a contactor for contacting with a plug, and the contactor is electrically

connected with electronic element for suppressing noise by a wire on the printed board. The printed board is encased in the insulated housing. It is difficult to imagine how the housing for the jack could be made of conductive material and still be insulated from the contactor; the same holds true for the terminals. Thus, the court finds that a person of ordinary skill in the art would find that "insulating housing" refers to a housing made of non-conductive material.

4. "Electronic element for suppressing noise"

[12] The parties dispute the meaning of the terms "electronic element" and "suppressing" as they are used in the phrase "electronic element for suppressing noise." These terms appear in claims 1, 2, and 4 of the '641 patent as follows:

1. A modular jack to be mounted on a circuit board, said modular jack comprising:

a printed board containing an *electronic element for suppressing noise;*

a contactor for contacting with a plug, said contactor being electrically connected with the *electronic element* by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the *electronic element* by a wire on the printed board; and

an insulating housing for encasing the printed board.

2. A modular jack as claimed in claim 1, wherein the noise suppressing *electronic element* is an array of common mode choke coils.

4. A modular jack as claimed in claim 1, wherein the noise suppressing *electronic element* is a chip capacitor.

a. "Electronic element"

Murata argues that "electronic element" should be construed simply as "an electronic component." Murata's Opening Brief, at 25. Bel Fuse argues that "electronic element" should be limited to "an electronic component (not including wound toroidal cores) such as a chip-type element." Bel Fuse's Responsive Brief, at 18. To support this limitation, Bel Fuse argues that one of the objects of the invention of the '641 Patent is to make the jack "compact," and if wound toroidal cores are used as the electronic element for suppressing noise, the jack cannot be compact. Bel Fuse also argues that since the specification discloses only embodiments that contain chip-type elements (an array of common mode choke coils, a chip inductor, and a chip capacitor), wound toroidal cores are not considered part of the invention.

In the background of the invention, the '641 Patent describes U.S. Patent No. 5,015,204 ("the '204 Patent") as prior art. '641 Patent, col. 1, ll. 33-56. The '204 Patent discloses a modular jack which contains a common-mode choke coil. *See* Ex. 3 to Bel Fuse's Responsive Brief. One end of the wire wound on the coil is the contactor which contacts with the plug, and the other end acts as a lead to connect with a printed board external to the modular jack. The '641 Patent states that the design of the '204 Patent has the following disadvantages: (1) since the contactor, terminal and coil are a single unit, they must be plated together which can result in unnecessary plating of the coil; (2) additional common mode choke coils are needed to increase the number of signal circuits, resulting in the jack not being compact; and (3) the pitch among the terminals is more than the 1.02 mm pitch of an ordinary circuit board, requiring a newly designed circuit board. '641 Patent, col. 1, ll. 33-56. The '641 Patent teaches that it has several advantages when compared to the prior art: (1) it is compact and economical; (2) the pitch among terminals can be set to the ordinary pitch of 1.02 mm or another value; (3) the contactor and terminal can be plated separately and with different

metals; and (4) a change in wire patterns on the printed board can accommodate an increase in the number of signal circuits. Id. at col. 1, l. 59-col. 2, l. 21.

Murata argues that these advantages are realized by the insertion of the printed board, rather than the elimination of wound toroidal cores. The court agrees. While the specification of the '641 Patent criticizes the configuration of the '204 Patent, that configuration is different from the disclosure of the '641 patent, not merely because the '204 Patent teaches use of a wound core but more importantly because it does not teach the inclusion of a printed board within the modular jack.

Additionally, there is no reason to limit the scope of "electronic element" to the embodiments disclosed in the '641 Patent. The '641 Patent discloses three preferred embodiments, each using a different electronic element for suppressing noise. The first embodiment teaches use of a common mode choke coil array. '641 Patent, col. 3, ll. 15-22. This array is placed on a base plate of ceramic material, thus making it a chip type element. Id. at col. 3, ll. 15-19. The second embodiment teaches a chip inductor, and the third embodiment teaches a chip capacitor. Id. at col. 4, ll. 20-22, 35-37. The three disclosed embodiments teach the specific electronic elements for suppressing noise that are claimed in dependent claims 2 (array of common mode choke coils), 3 (chip inductor), and 4 (chip capacitor). Therefore, the electronic element for suppressing noise of independent claim 1 must be broader than merely those three examples. Phillips, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.") (citing Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed.Cir.2004)). However, the application of this maxim to this case does not support Murata's construction because it does not necessarily follow that claim 1 must be broad enough to include all electronic elements for suppressing noise. For example, claim 1 would be broader than dependent claims 2, 3, and 4 if claim 1 included all chip type elements beyond the three claimed in the dependent claims.

That being said, there is nothing in the specification or description of the prior art to indicate that the "electronic element" is limited to chip type elements or excludes wound toroidal cores. While the specification suggests that chip-type elements might be preferred, as discussed above, the specification speaks inclusively of other embodiments:

Although the present invention has been described in conjunction with the embodiments above, it is to be noted that various changes and modifications are apparent to those who are skilled in the art. Such changes and modification are to be understood as included within the scope of the present invention defined by the appended claims.... [T]he method of providing an electronic element such as the common mode choke coil array 20, the chip inductors 40, the chip capacitors 50 or the like for the printed board 30, 41 and 51 ... may be determined arbitrarily.

'641 Patent, col. 4, ll. 50-56, 59-62, 64-65.

Additionally, even if using wound cores would make the modular jack somewhat less compact than using other noise suppressing elements, the other objects of the invention could still be satisfied, such as allowing the pitch among the terminals to be set to the ordinary pitch of 1.02 mm or another value and allowing the contactor and terminal to be plated separately and with different metals. Phillips, 415 F.3d at 1327 ("We have held that '[t]he fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives.' ").

For these reasons, the court finds that one of ordinary skill in the art would not have interpreted "electronic element" as used in the claims of the '641 patent, in light of the specification, as excluding wound toroidal cores or being limited to chip-type elements. Thus, the court construes"electronic element" as an "electronic component."

b. "Suppressing"

[13] Murata argues that "suppressing" as used in claim 1 of the '641 Patent means "limiting, attenuating, claiming, shunting, or bypassing." Murata's Opening Brief, at 25. Bel Fuse argues that it means "eliminating or attenuating." Bel Fuse's Responsive Brief, at 18. Claim 1 recites "a printed board containing an electronic element for suppressing noise." The court construed "electronic element" above as "an electronic component," and the parties agree that "noise" is properly construed as "undesired electrical signals." Thus, Murata argues that "electronic element for suppressing noise" means "an electronic component which serves to limit, attenuate, clamp, shunt, or bypass undesired electrical signals." But Bel Fuse argues that it means "an electronic component for eliminating or attenuating undesired electrical signals."

Bel Fuse argues that Murata's construction of "suppressing" is overly broad. According to Bel Fuse, the specification of the '641 Patent does not teach noise suppression that occurs by shunting, bypassing, clamping, or limiting. The specification of the '641 Patent, Bel Fuse argues, teaches eliminating and attenuating noise. For example, when describing the first embodiment, the specification states:

In the modular jack with this structure, noise is suppressed by the common mode choke coils 24 built into the coil array 20. Specifically, common mode noise received through the contactors 35 is *eliminated* in the common mode choke coils 24, and thereby outgoing noise through the terminals 36 is suppressed.

'641 Patent, col. 3, ll. 48-53 (emphasis added).

Murata argues that "suppressing" as used in claim 1 of the '641 Patent is entitled to its entire ordinary meaning which includes: "limit, attenuate, clamp, shunt, or bypass." Murata relies on Dr. Hughes' expert report in which he opined that these terms are included within the ordinary meaning of "suppress." To reach this construction, Dr. Hughes relied on two dictionary definitions: one contained in Webster's New World Dictionary of American English 1346 ("suppress" means "keep back"; "restrain, check"; "eliminate or weaken") FN9 and one contained in the Modern Dictionary of Electrocs ("suppression" means "elimination of unwanted signals or interference by means of shielding, filtering, grounding, component relocation, or sometimes redesign"; "the reduction to an acceptable level of a certain frequency or frequencies"). Hughes' Report, at 4-5. Dr. Hughes thus concludes that a noise suppressing electronic element in the context of the ' 641 patent is "an electronic component which serves to limit, attenuate, clamp, shunt, or bypass undesired signals (i.e., noise), and all equivalents thereof." Id. at 5. What is troubling about Dr. Hughes' construction is its conclusory nature. Phillips, 415 F.3d at 1318 ("[C]onclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court."). The terms "limit, attenuate, clamp, shunt, or bypass" do not appear in the dictionary definitions cited by Dr. Hughes, and he gives no explanation as to how he transformed the dictionarydefinitions into his proposed construction.

FN9. While Murata provided the court with definitions of other terms from this dictionary, Ex. 30 to Murata's Opening Brief, at least in the copy provided to the court, it neglected to include the definition of this term. The court is therefore unable to review this definition in its original source or other entries for this term in this dictionary.

In eliminating these terms from its proposed construction, Bel Fuse relies only on the preferred embodiments disclosed in the '641 Patent which it states describe only "eliminating" and "attenuating" noise. Bel Fuse argues that the court should not include "shunt" or "bypass" because these operations would require additional circuitry not disclosed in the '641 Patent. Bel Fuse also argues that, since the patent does not discuss "clamping" or "limiting" noise, it is unclear what those terms would mean in the context of the patent. Because Bel Fuse relies only on the specification with no other supporting evidence, Murata argues that Bel Fuse's construction is "attorney argument." Murata's Reply, at 13.

However, because Dr. Hughes' report is conclusory and it appears that Bel Fuse is correct that the specification does not disclose shunting, bypassing, clamping, or limiting, the court adopts Bel Fuse's proposed construction of "eliminating or attenuating." FN10

FN10. The court notes its role in claim construction is to determine the meaning of the claim term from the viewpoint of a person of ordinary skill in the art. Because the parties' briefing on "suppressing" has been scant, and neither party has made clear the meanings of "shunting," "bypassing," "clamping," or "limiting," the court has been limited in its ability to construe the meaning of this term.

5. **"*Containing*"**

[14] Claim 1 of the '641 Patent uses the term "containing" as follows:

1. A modular jack to be mounted on a circuit board, said modular jack comprising:

a printed board *containing* an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a wire on the printed board; and

an insulating housing for encasing the printed board.

Murata argues that "containing" means "including as a component." Murata's Opening Brief, at 28. Bel Fuse argues that "containing" means "held by or mounted on." Bel Fuse's Responsive Brief, at 23. The difference between these constructions is that Bel Fuse argues that the electronic element for suppressing noise must be physically "held by or mounted on" the printed board whereas Murata argues that "containing" is not so limited.

Bel Fuse argues that each of the three disclosed embodiments shows that the element for suppressing noise is "held by" or "mounted on" the printed board. Again, this court is wary of placing too much emphasis on the disclosure of the preferred embodiments, particularly where the specification contemplates modifications to the disclosed embodiments, because doing so may lead to improperly importing limitations from the specification into the claims. Phillips, 415 F.3d at 1323 (stating that courts should avoid "reading limitations from the specification into the claim").

Bel Fuse also argues that its construction is necessarily correct because the electronic element must be mounted on the printed board to be electrically connected to the printed wires on the printed board. However, because the court has rejected Bel Fuse's construction of "wire on the printed board" which would have required the wire to be printed, this argument no longer holds any force.

Murata's proposed construction of "containing" is supported by the Federal Circuit's decision in Mars, Inc. v. H.J. Heinz Co., L.P., 377 F.3d 1369 (Fed.Cir.2004). In Mars, the Federal Circuit held that the term "containing" is an open-ended term which does not exclude additional, unnamed elements. Id. at 1375-76. Citing a general purpose dictionary, the court also stated that "containing" is synonymous with "comprising" and "including." Id. In this case, Bel Fuse is attempting to transform the term "containing" into a structural requirement, namely, that the printed board physically hold the component or that the component be mounted on the board. There is no indication in the patent that such a requirement is present. Rather,

consistent with the Federal Circuit's holding in Mars, the court finds that "containing" is simply an open-ended term that denotes that the electronic element for suppressing noise is simply one component of the printed board. Thus, the court adopts Murata's proposed construction and holds that "containing" means "including as an component."

C. ***Summary***

For the foregoing reasons, the court adopts the following constructions:

-> "Modular jack" means "the female portion of a modular connector in which wires of a circuit are connected at one end and into which a plug is inserted at the other end."

-> "Printed board" means "a generally flat piece of material typically fabricated from insulating material that provides support and structural integrity for a plurality of electrically interconnected components comprising a circuit, with some or all of the conducting interconnection pattern formed on the board."

-> "Wire on the printed board" means "a conductive metallic element interconnecting various regions, contributing to the interconnecting of various regions, on the printed board."

-> "Insulating housing" means "a covering which has a high electrical resistance and which can serve to prevent a short circuit between components."

-> "Electronic element" means "an electronic component."

-> "Suppressing" means "eliminating or attenuating."

-> "Containing" means "including as an component."

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