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INTERPRETING WORDS IN A PATENT

Douglas Y'Barbo*

Introduction

The unquestionable center of gravity of a patent infringement suit is the meaning of selected words in the patent claim. The process that a court applies to decide the meaning of disputed language; whether it ought to consider evidence outside the patent record; and if it does, whether factual findings made from that evidence are entitled to deference on appeal are the three tightly reticulated questions that comprise the claim construction debate. They are also the most frequently debated and most pressing questions in patent law. This Article is directed to a single model to resolve the debate over these three chronic problems.

I. An Informal Taxonomy of Claim Construction Disputes

The interpretive model presented in this article is premised upon empirical observation, i.e., by observing how claim construction is actually performed by the Federal Circuit. This examination reveals that claim construction proceeds through selection by the trial judge or Federal Circuit panel using one of two constructions presented by the parties: one proffered by the patent owner and one by the accused infringer. In other words, claim construction--judicial rhetoric notwithstanding--is not an unconstrained search of the disputed term's meaning, but instead a more ordinary process of selection from among two alternatives. This selection is made between two proffered interpretations for the disputed claim language. The author suggests that one way to understand claim construction is to understand precisely how these two proffered interpretations compare to one another, and how the interpretations compare to a single agreed-upon benchmark (the term's fixed meaning).

Empirical observation aside (i.e. what courts actually do), this process of construction is the most sensible. The essential question under which all others are subsumed is whether the accused device lays within the scope of the patent owner's property right. For the purposes of analysis, this question is ordinarily divisible into ***192** two smaller questions: (1) what is the scope of the property right?; and (2) does the accused device lay within it? The scope of the property right is determined from the patent's claims, which are mainly expressed in words and their meanings. Empirically speaking, only a few words, sometimes just one, are in dispute. Therefore, determining the scope of the property right--the first step in the infringement question--is actually a

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matter of interpreting a few words (i.e. the disputed claim terms). The trial court identifies the disputed claim term or terms, then requires the two parties to offer their respective constructions of that term. Naturally, the accused infringer will urge a construction of the disputed term that places the accused device *outside* the just-determined scope, and not surprisingly this proffered construction is as broad as possible yet just barely avoids the accused device. Of course, the patent owner will urge a construction that places the accused device *within* the scope. Yet while the patent owner wishes to urge a construction that captures the accused device, he is careful not to offer a proposed construction that is so broad that the recently construed claims are judged invalid.¹ Hence, the process of proffering an interpretation of the disputed claim's term has a strong self-policing character to it. The trial court decides infringement by construing the patent claims. The court can certainly refuse to select one of the two proffered constructions and create its own, but there is no point in doing so because whatever that construction is, it will either capture the accused device or release it.

At the end of the day, the accused device either infringes or it does not. The trial court's only task is to answer that binary question; it cannot, regardless of what it does, supplement that result. There is no point in seeking a finer distinction that the end result permits. Therefore, claim construction should not be an unbounded search for the disputed term's *meaning* but instead a rational process of selection from between the two proffered alternatives.

What follows is a discussion of three distinct lines of cases. Each line of authority has emerged in response to the directives of *Markman v. Westview Instruments, Inc.*, and each is by now securely installed in the Federal Circuit's claim construction jurisprudence.² As we shall see, step-wise application of the principle embodied in each line actually defines post-*Markman* claim construction.

*193 II. The Markman Model

A. *What is Claim Construction?*

In *Modine Mfg. v. United States International Trade Commission*, a case decided shortly after *Markman*, the disputed claim term was "flat side walls" in a patent directed to a refrigerant condenser used in automotive air conditioners.³ Because the accused device had fin-like projections on the interior walls of its condenser (to increase the

¹ Claims are held invalid for numerous reasons. The particular reasons with which we are concerned with in this case are when the claims read on prior art or when the claims are not enabled by the specification.

² *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 U.S.P.Q.2d 1321 (Fed. Cir. 1995) (en banc), *aff'd*, 116 S. Ct. 1384, 38 U.S.P.Q.2d 1461 (1995).

³ *Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1550, 37 U.S.P.Q.2d 1609, 1611 (Fed. Cir. 1996).

surface area, thus providing additional condensation), the accused infringer argued that “flat side walls” meant that the *interior* walls of the condenser are smooth or without fins or webbing.⁴ The patent owner, Modine, argued that the “flat side walls” referred to the cross-sectional *exterior* shape of the condenser tubes; thus, it meant that the tubes in cross-section are not circular but oval.⁵

The disputed claim language appears this way in the claim: “[w]eb means *within* said flat cross-section tubes and extending between and joined to the flat side walls”⁶ The claim not only allows interior web fin-like projections but it requires them. According to the accused infringer, “flat” means *without* web means; but “web means” and “flat” are both required elements of the claimed condenser.⁷ If the accused infringer were correct that “flat side walls” meant that the interior walls were without web means, then the claim is internally inconsistent. Because a patented device cannot both have an element and not have it at the same time, the accused infringer’s proffered construction produced a linguistically implausible reading of the claims. Therefore, construction of the disputed claim term was resolved entirely by eliminating one of the two proffered constructions by identifying the one that produced an implausible reading of the text. In other words, the dispute in *Modine* was soluble solely from the claims themselves without the need for extrinsic evidence.

***194** Now compare *Modine* with *Markman*. The patent in *Markman* was directed to a system for tracking various items in a retail dry cleaning operation to prevent loss and theft.⁸ The disputed claim term was “inventory.”⁹ The patent owner, Markman, argued that it could refer to *either* cash or clothes, as well as cash and clothes together.¹⁰ The trial court quickly discarded this construction since it rendered the claim limitation internally incoherent: “[w]hereby said system can detect and localize spurious additions to inventory as well as spurious deletions therefrom.”¹¹ The trial court reasoned that if the term “inventory” could refer to cash only, then this limitation rendered the entire claim incoherent.¹² The reason is that cash is not “localized” since it does not travel through the

⁴ *Id.* at 1550, 37 U.S.P.Q.2d at 1611.

⁵ *Id.*, 37 U.S.P.Q.2d at 1611.

⁶ *Id.* at 1549, 37 U.S.P.Q.2d at 1611 (emphasis added).

⁷ *Id.* at 1550, 37 U.S.P.Q.2d at 1611-12.

⁸ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 U.S.P.Q.2d 1321 (Fed. Cir. 1995) (en banc), *aff’d*, 116 S. Ct. 1384 (1995).

⁹ *Id.* at 974, 34 U.S.P.Q.2d at 1325.

¹⁰ *Id.*, 34 U.S.P.Q.2d at 1325.

¹¹ *Id.* at 982, 34 U.S.P.Q.2d at 1331.

dry cleaning system.¹³ Also, cash is not reasonably subject to “spurious additions” to the system.¹⁴ The Court concluded that the term “inventory” cannot mean just “cash.”¹⁵

In *Markman*, just like in *Modine*, the claim construction dispute was resolved not by a quixotic search for the term’s true meaning, but instead by a pragmatic yet systematic process of eliminating the linguistically implausible interpretation from among the two proffered constructions. Not once did the Federal Circuit in *Markman* or *Modine* even hint at what was the “true meaning” of the term “flat side walls” or “inventory.” Again, the accused infringer argued that “inventory” must refer to at least clothes (e.g., either clothes *or* clothes and cash).¹⁶ The patent owner argued that it could refer to just cash.¹⁷ The *Markman* Court resolved the dispute not by asking what the term actually meant, but instead by checking each of the two proffered conjectures against the text and eliminating the one that fails to preserve the text’s internal coherence. Thus the *Markman* Court *195 never once actually said what “inventory” meant, though it did say, that whatever it meant, it could not refer to just cash.¹⁸

First, notice that the *Markman* and *Modine* panels did not assign meaning to the disputed claim language. Instead each produced its construction by selecting one from among the two constructions proffered by the parties, and more particularly, by eliminating the least plausible one. Indeed, almost without exception, the Federal Circuit performs the process of claim construction not by creating or determining the meaning of the claims. Instead what the Court does, if one looks closely enough, is select one of the two constructions proffered by the parties; often by eliminating the least plausible

¹² *Id.*, 34 U.S.P.Q.2d at 1331.

¹³ *Id.*, 34 U.S.P.Q.2d at 1331.

¹⁴ *Markman*, 52 F.3d at 971, 34 U.S.P.Q.2d at 1331.

¹⁵ *Id.* at 988-89, 34 U.S.P.Q.2d at 1337.

¹⁶ *Id.* at 974, 34 U.S.P.Q.2d at 1325.

¹⁷ *Id.*, 34 U.S.P.Q.2d at 1325.

¹⁸ Sometimes Federal Circuit opinions recite the “meaning” of the claim in these terms (i.e., by what the scope does *not* include). For example, “[t]he word ‘passage’ in the asserted claims, properly construed, does not encompass a completely cylindrical, smooth-walled structure.” *O.I. Corp. v. Tekmar Co. Inc.*, 115 F.3d 1576, 1581, 42 U.S.P.Q.2d 1777, 1781 (Fed. Cir. 1997).

alternative.¹⁹ This is an empirically demonstrable proposition. The Federal Circuit or its predecessor court has rejected both parties' proffered constructions and decreed its own claim construction a grand total of *three times* in the past twenty years.²¹ The majority opinion in each case was authored by the same judge, Judge Clevenger. Moreover, two of these cases in particular, *Exxon Chemical Patents, Inc. v. Lubrizol Corporation* and *J.T. Eaton v. Atlantic Paste Glue Company*, were harshly criticized, both by the dissenting judges and by the patent *196 bar.²² Both cases were criticized not only for *de novo* construction but also for the particular construction the court chose.²³

¹⁹ That is why one often sees Federal Circuit judges state in *dictum* that claim construction is generally dispositive of the infringement analysis. Of course it's dispositive. The patent owner proffers a construction of the disputed claim term that, if selected, would place the accused device within the claim scope; and the accused infringer proffers a construction that, if selected, would place the accused device outside the claim scope.

²⁰ Also, claim construction is really not a process of determining the scope of the claims. Instead, it is a matter of interpreting one or more (often just one) disputed words or terms within the claim: As with many patent cases, at issue is the meaning of only a few words in the claims--sometimes just a single word, rarely more than three or four." See, e.g., *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 47 U.S.P.Q.2d 1418 (Fed. Cir. 1998).

²¹ See, *J.T. Eaton v. Atlantic Paste Glue Co.*, 106 F.3d 1563, 41 U.S.P.Q.2d 1641 (Fed. Cir. 1997); *Ethicon Endo-Surgery Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 40 U.S.P.Q.2d 1019 (Fed. Cir. 1996); and *Exxon Chemical Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 35 U.S.P.Q.2d 1801 (Fed. Cir. 1995). These are all Clevenger opinions. Thus, while Judge Clevenger has failed to grasp the Federal Circuit's established practice of claim construction, consider how he tentatively followed the *Markman* approach (only to ignore it later): "Therefore, in our view, the plain meaning of the claim will not bear a reading that 'pusher assembly' and 'pusher bar' are synonymous." *Ethicon*, 93 F.3d at 1579, 40 U.S.P.Q.2d at 1024. He should have stopped right there but he didn't. In the very next sentence he said this: "The question remains, though, what is the meaning of the term 'pusher assembly'?" *Id.*

²² See, e.g., Kelly Ann Casey, *Recent Developments: Exxon Chemical Patents v. Lubrizol Corp.: The Federal Circuit Sets Unreasonable Standards for Chemical Composition Inventions*, 31 GA. L. REV. 1223, 1228 (1997); *A Statutory Solution to the Mischief of Markman v. Westview Instruments, Inc.*, 63 BROOKLYN L. REV. 279, 308 (1997).

²³ Casey, *Recent Developments*, 31 GA. L. REV. at 1228; Note, *A Statutory Solution*, 63 Brooklyn L. Rev. at 308.

Second, *Markman*'s core proposition is that "[a] term can be defined only in a way that comports with the instrument as a whole".²⁴ The opinion reiterated more precisely that it required that the proposed definition fully complies with the specification and claims and so will preserve the patent's internal coherence. This is a sophisticated interpretive model and a challenging directive to execute. But how can we tell whether a particular construction of a disputed claim term preserves the patent's internal coherence? In fact, it's difficult to do since it requires reading the entire text and having a thorough understanding of the complex relationship between the invention's primary elements. However, what is much easier is to tell is whether a particular construction does *not* preserve the text's internal coherence.²⁵ Thus, if one conjecture is checked against the text and it renders two portions of the text incoherent or in conflict with one another, then this conjecture must be discarded. Hence, "internal textual coherence" is a reasonably objective baseline indeed as evidenced by *Modine* and *Markman*. As we shall see, the Federal Circuit has relied upon this baseline to decide a number of post-*Markman* disputes, and from these decisions a rule has coalesced.

Markman and *Modine* stand for the proposition that claim construction is not a process of assigning meaning to each of the terms in a claim, rather it is a process of systematically eliminating implausible interpretations (i.e. textual not technical implausibility). The linguistic competence needed to do this is not high. For instance, consider the statements "all cocker spaniels are dogs," "Cujo is not a dog," and "Cujo is a cocker spaniel." If one can tell that if the first two statements are correct then the third is not. Thus, the third statement renders the "text" (the sum of the three statements) incoherent. Notice that one can make this claim about the implausibility of statement number three, even if they have never seen a cocker spaniel nor ever met Cujo. Similarly, one could confirm that the accused infringer's proffered construction in *Modine* was implausible without any knowledge of condenser technology.

***197 B. Other Cases That Apply the Markman Model**

Vitronics Corporation v. Conceptronics, Inc. is a virtually identical dispute.²⁶ Despite almost unanimous criticism from the patent bar, this case is correctly decided beyond a shadow of a doubt. In *Vitronics*, the disputed claim term was "solder reflow temperature."²⁷ Unfortunately, this term was not used anywhere in the specification.²⁸

²⁴ *Markman*, 116 S.Ct. at 1391, 38 U.S.P.Q.2d at 1470 (citations omitted).

²⁵ *Id.*, 38 U.S.P.Q. at 1470.

²⁶ *Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576, 39 U.S.P.Q.2d 1573 (Fed. Cir. 1996).

²⁷ *Id.* at 1579, 39 U.S.P.Q.2d at 1574.

²⁸ *Id.* at 1580, 39 U.S.P.Q.2d at 1574.

The first time it appears is in the claims.²⁹ Two other terms were in fact mentioned in the specification: “liquidus temperature” and “peak reflow temperature.”³⁰ So the question was which of these two terms was synonymous with the disputed claim term. The plaintiff, Vitronics, argued that the disputed claim term, “solder reflow temperature,” referred to “peak reflow temperature.”³¹ The accused infringer, Conceptronics, argued that the disputed claim term referred to “liquidus temperature.”³²

Two different temperatures are relevant in soldering technology as it relates to the Vitronics patent.³³ The first is the temperature at which the solder first begins to melt and freely flow (the liquidus temperature).³⁴ The second important temperature is the one in which the solder *re*-flows after first melting, obviously a higher temperature than the first (the peak reflow temperature).³⁵ In the Vitronics specification, three exemplary types of solder are described each having a liquidus *198 temperature of 190° C and a peak reflow temperature of about 210-218° C.³⁶ With that background in mind, here is that crucial claim language: “A method for reflow soldering ... for a period of time sufficient to cause said solder to reflow and solder said devices to said board while maintaining the temperature of said device below said solder reflow temperature.”³⁷ Thus, Claim 1 recites a process of soldering “[w]hile maintaining the temperature below said solder reflow temperature.”³⁸ Again, whether the claim term “solder reflow temperature” refers to

²⁹ Generally, the Federal Circuit decisions and the scholarly commentary use the term “specification” to refer to the entire patent document minus the claims. Thus, in common vernacular, the patent document consists of the specification and the claims. In fact, the claims are part of the specification according to the Patent Code (35 U.S.C. § 112 ¶ 1 (1988)). I shall use the terms “specification” and “claims” consistent with their common usage, rather than in the formal sense.

³⁰ *Vitronics Corp.*, 90 F.3d at 1580, 39 U.S.P.Q.2d at 1574.

³¹ *Id.*

³² *Id.*, 39 U.S.P.Q.2d at 1574.

³³ *Id.* at 1579-80, 39 U.S.P.Q.2d at 1574.

³⁴ *Id.* at 1580, 39 U.S.P.Q.2d at 1574.

³⁵ *Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576, 1579-80, 39 U.S.P.Q.2d 1573, 1574 (Fed. Cir. 1996).

³⁶ *Id.* at 1580 n.3, 39 U.S.P.Q.2d at 1574 n.3.

³⁷ *Id.* at 1579, 39 U.S.P.Q.2d at 1574.

³⁸ *Id.*, 39 U.S.P.Q.2d at 1574.

“liquidus temperature” or to “peak reflow temperature” is the issue on appeal.³⁹

If the disputed claim term refers to “liquidus temperature” (as defined in the specification) then the claim language just recited makes no sense. One cannot solder *below* the liquidus temperature; by definition, that is the temperature at which the solder *first* begins to melt.⁴⁰ Thus, below the liquidus temperature soldering cannot occur. On the other hand, if the disputed claim term referred to the peak reflow temperature then this portion of the claim is at least sensible or not internally incoherent. So *Vitronics*, just like *Markman* and *Modine*, is an extraordinarily easy dispute to resolve, one of the two proffered constructions renders the claim incoherent and therefore must be rejected.⁴¹ Also just like *Markman*, the *Vitronics* Court never bothered to find the *correct* meaning of the disputed claim term. Instead, all it did was determine that it could not mean “liquidus temperature,” but that it could plausibly refer to “peak reflow temperature.”

In *Vitronics*, the Federal Circuit vacated the trial court’s construction of the claims,⁴² and in both *Markman* and *Vitronics*, the trial courts relied upon extrinsic evidence. Yet on appeal, the Federal Circuit did not look at the extrinsic evidence, but instead produced its construction based solely upon the intrinsic record. More to the point: the case did not involve a re-reading of the extrinsic record. Therefore, according to the *Vitronics* court, deference is not owed to those factual findings because any factual findings produced were illegitimate (i.e., they were not *199 necessary to resolve the dispute, as evidenced by the fact that the panels did not consider them in reaching a contrary construction). So one must not confuse cases of this sort with those like *Bausch & Lomb Inc. v. Barnes-Hind/Hydrocurve Inc.*⁴³ There the Federal Circuit (pre-*Markman*), like *Vitronics*, set aside the trial court’s claim construction and developed its own, but unlike *Vitronics*, based its construction, at least in part, upon the re-reading of the extrinsic record.

C. A Brief Digression: The Proper Standard of Review

³⁹ *Id.* at 1580, 39 U.S.P.Q.2d at 1575.

⁴⁰ *Id.*, 39 U.S.P.Q.2d at 1574.

⁴¹ And yet despite this simplicity, *Vitronics* was decided after a lengthy trial followed by an appeal. This case should illustrate, as well as any, that nearly any dispute no matter how simple, can be made much more complex once extrinsic evidence--particularly expert testimony--is admitted.

⁴² *Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576, 1586, 39 U.S.P.Q.2d at 1580 (Fed. Cir. 1996).

⁴³ *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986).

If this view is correct, then it offers a solution to the debate over the proper standard of review in claim construction disputes. The *Markman* and *Cybor Corporation v. FAS Technologies, Inc.* courts--both *en banc* decisions--have decreed that the standard of review is *de novo*. Yet the debate over the deference owed to factual findings made at the trial level continues as evidenced by cases like *Fromson v. Anitec Printing Plates, Inc.* and *Eastman Kodak v. Goodyear Tire & Rubber Company*, and even more recently, two post-*Cybor* cases, *Voice Technologies* and *Key Pharmaceuticals*.⁴⁴

In fact, many standards of review in U.S. law, including patent law, are *de novo*.⁴⁵ Yet underlying facts are still assessed under a more discretionary standard; hence most *de novo* standards are actually a hybrid or layered standard.⁴⁶ *Markman* *200 and *Vitronics* are perfectly consistent with this background rule. In these two cases, the extrinsic evidence was not reviewed under *any* standard, since the Federal Circuit made an *a priori* determination that the lower court should not have relied upon extrinsic evidence at all. If it had decided that extrinsic evidence was properly received during trial, then deference is owed to those factual findings.⁴⁷ This plenary authority to assign the dispute to one category or another (i.e., to determine whether extrinsic evidence is necessary or not) *defines de novo* review in claim construction disputes. This view accounts for the desire to defer to trial courts on factual findings, which are beyond question the more experienced and structurally far better situated forum to conduct factual inquiries, while at the same time ensuring that trial courts do not slowly but insidiously short circuit appellate review by re-labeling then subsuming the entire dispute under the rubric of “factual determinations.”

⁴⁴ *Fromson v. Anitec Printing Plates, Inc.*, 132 F.3d 1437, 45 U.S.P.Q.2d 1269 (Fed. Cir. 1997); *Eastman Kodak v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 42 U.S.P.Q.2d 1737 (Fed. Cir. 1997); *Voice Technologies Group, Inc. v. VC Systems, Inc.*, 164 F.3d 605, 49 U.S.P.Q.2d 1333 (Fed. Cir. 1999); *Key Pharmaceuticals v. Hercon Laboratories, Corp.*, 161 F.3d 709, 48 U.S.P.Q.2d 1911 (Fed. Cir. 1998).

⁴⁵ For instance, the obviousness determination under section 103 of the Patent Code “[i]s a question of law that this court reviews *de novo*” *In re Donaldson Company, Inc.* 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994) (*en banc*), as is the enablement standard under § 112, ¶ 1 “Although the question of whether [a party’s foreign priority] specification contains a sufficient disclosure under 35 U.S.C. § 112, ¶ 1 is one of law, ... compliance with the written description aspect of that requirement is a question of fact.” *Utter v. Hiranga*, 845 F.2d 993, 6 U.S.P.Q.2d 1709 (Fed. Cir. 1988).

⁴⁶ *See, Fromson*, 132 F.3d 1437, 45 U.S.P.Q.2d 1269 (Fed. Cir. 1997); *Eastman Kodak*, 114 F.3d 1547, 42 U.S.P.Q.2d 1737 (Fed. Cir. 1997); *Voice Technologies Group, Inc.*, 164 F.3d 605, 49 U.S.P.Q.2d 1333 (Fed. Cir. 1999); *Key Pharmaceuticals*, 161 F.3d 709, 48 U.S.P.Q.2d 1911 (Fed. Cir. 1998).

⁴⁷ *See, e.g., Eastman Kodak Co.*, 114 F.3d at 1555, 42 U.S.P.Q.2d at 1742.

D. Still More Cases That Apply the Markman Model

Permitting extrinsic evidence into the claim construction inquiry dilutes the record, which inevitably enlarges the error rate. *Vitronics* is a perfect example. The trial court allowed and relied upon extrinsic evidence. The Federal Circuit reached a contrary claim construction by relying solely on the intrinsic evidence. As evidenced by this discussion, *Vitronics* was an unusually easy case--one of the two proffered constructions produced an implausible or contradictory reading of the patent and was therefore quickly eliminated by a straightforward reading of the patent. That is the impression one gets from reading the Federal Circuit's opinion, yet the case also demonstrates that easy cases become difficult when an ocean of extrinsic evidence obscures the debate. *Vitronics* stands squarely for the proposition that no amount of technical detail will transform a linguistically implausible interpretation into a plausible one, but what it may do is coax the trial court in the face of a heap of extrinsic evidence in predictable equipoise (to overlook an easy solution).

Next, consider *Maxwell v. J. Baker, Inc.*, which is another post-*Markman* case.⁴⁸ *Maxwell* involved a device for securing together a single pair of shoes.⁴⁹ Retail stores prefer that each pair of shoes be kept together.⁵⁰ If they become *201 separated, then they may become undesirable if the customer can't locate the other member of the pair. For shoes with laces, this isn't a problem because a plastic thread can be run through one eyelet of each shoe and then the two ends of the thread connected.⁵¹ For shoes without eyelets for laces (e.g., woman's high-heeled pumps), this technique is not operable.⁵² Consequently, the inventors of the patent-in-suit developed a *tab* which is placed along the inside of each shoe, which roughly function like ordinary eyelets in shoes having laces.⁵³ At the end of each tab is a small eyelet through which a plastic thread can be run, hence connecting the two shoes.⁵⁴

The accused tab was actually a part of the shoe's lining, so the defendant argued that the claim term "fastening tab" must be *separate from* the shoe's lining.⁵⁵ By contrast,

⁴⁸ *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 39 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

⁴⁹ *Id.* at 1101, 39 U.S.P.Q.2d at 1002.

⁵⁰ *Id.*, 39 U.S.P.Q.2d at 1002.

⁵¹ *Id.*, 39 U.S.P.Q.2d at 1002.

⁵² *Id.*, 39 U.S.P.Q.2d at 1002.

⁵³ *Id.*, 39 U.S.P.Q.2d at 1002.

⁵⁴ *Id.*, 39 U.S.P.Q.2d at 1002.

⁵⁵ *Id.* at 1105, 39 U.S.P.Q.2d at 1005.

the patent owner argued that the tab could be a part of the shoe's lining.⁵⁶ Consider the relevant claim language: "[t]ab ... extending vertically upward ... but spaced apart from the inside surface of the shoe upper."⁵⁷ The disputed claim term "shoe upper" indisputably includes the inner lining; therefore, the claim itself forecloses the plaintiff's proffered construction (i.e., the plaintiff argued that the fastening tab can be a part of the shoe's lining). Specifically, the claim requires that the tab be spaced apart from the lining.⁵⁸ Hence, if it is part of the shoe's lining, then the portion of the claim just recited makes no sense; i.e., a tab cannot be both part of the shoe lining and spaced apart from it.

Once again, like *Markman*, *Vitronics*, and *Modine, Maxwell* is soluble solely by a careful inspection of the claim itself. Indeed, one cannot help but be struck by the simplicity of these disputes. This is particularly obvious once the focus is redirected towards the intrinsic record. No doubt such disputes can be made complicated if the dispute is poorly framed (the disputed claim term is not precisely identified, or the two proffered constructions are not established), or if the trial court yields to the unfortunate temptation to open the floodgates and let in the inevitable avalanche of extrinsic evidence once either party urges some tiny sliver of ambiguity *202 (which is what happened in *Vitronics* for instance). The need to avoid complicating what are genuinely simple disputes, therefore, is perhaps responsible more than anything else for the Federal Circuit's militant proscription on extrinsic evidence expressed in *Vitronics*, and slightly less so in *Markman*. Indeed, this proscription is well grounded provided that the claim construction dispute fits the model just described that is where one of the two proffered constructions is eliminated on the ground that it renders the text internally incoherent.

In *Harris Corp. v. IXYS Corp.*, the patent at issue was related to a particular type of semiconductor device known as a MOSFET (Metal Oxide Semiconductor Field Effect Transistor), which is used to control the flow of electrical power.⁵⁹ A thyristor is a similar device, but it exhibits "latching," which refers to the fact that the thyristor will turn on and remain on even after a gate control signal is removed.⁶⁰ This latching property arises from the structure of the thyristor.⁶¹ The four alternating semiconductor regions incorporate two three-layer combinations, each of which has a forward current gain denoted as α_1 and α_2 .⁶² According to the standard teaching in the semiconductor art, a

⁵⁶ *Id.*, 39 U.S.P.Q.2d at 1005.

⁵⁷ *Id.* at 1102, 39 U.S.P.Q.2d at 1003.

⁵⁸ *Id.*, 39 U.S.P.Q.2d at 1003.

⁵⁹ *Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 43 U.S.P.Q.2d 1018 (Fed. Cir. 1997).

⁶⁰ *Id.* at 1151, 43 U.S.P.Q.2d at 1019.

⁶¹ *Id.*, 43 U.S.P.Q.2d at 1019.

⁶² *Id.*, 43 U.S.P.Q.2d at 1020.

thyristor will not latch if the sum of α_1 and α_2 is less than one.⁶³

The claim at issue was directed to a MOSFET device; the disputed language was: “no thyristor action occurs under any device operating conditions.”⁶⁴ IXYS, the accused infringer, argued that the disputed language referred only to four-layer devices that, because of their structure, *never* acted as thyristors (i.e., in other words, $\alpha_1 + \alpha_2$ is always less than one).⁶⁵ The patent owner, Harris, predictably argued for a broader construction: that the MOSFET device can act as a thyristor under certain conditions as long as the device was intended to be operated below the thyristor threshold.⁶⁶ Thus, according to the accused infringer the claim excludes thyristors, and according to the patent owner the claim can include them.

***203** The Federal Circuit rejected Harris’s broad interpretation and selected the one urged by IXYS.⁶⁷ Despite the obvious complexity of the technology, the Court produced its construction without extrinsic evidence. Indeed, like *Modine* and the other cases discussed in this section, the Court reached its construction by eliminating one of the two proffered constructions; the Court’s reasoning was linguistic rather than technical. In this instance, the Court observed that Harris’s proffered construction was difficult to reconcile with the claim language “under *any* device operating conditions,” since Harris urged that an accused device could infringe if it exhibited thyristor behavior under *some* operating conditions.⁶⁸ In straightforward terms, the Court eliminated Harris’s argument once it identified an obvious linguistic inconsistency: In plain terms, Harris’s claim construction argument is that the intended “operating conditions” of the patented device do not include conditions that cause the device to latch, and therefore the device does not latch under its intended “operating conditions.”⁶⁹

In summary, the Federal Circuit resolved a claim construction dispute relating to particularly complex technology without a single glance at extrinsic evidence based solely on identifying each party’s proffered construction, and then eliminating the one that produced an incoherent reading of the patent.

⁶³ *Id.*, 43 U.S.P.Q.2d at 1020.

⁶⁴ *Id.*, 114 F.3d at 1152, 43 U.S.P.Q.2d at 1020.

⁶⁵ *Id.*, 43 U.S.P.Q.2d at 1020.

⁶⁶ *Id.*, 43 U.S.P.Q.2d at 1020.

⁶⁷ *Id.*, 43 U.S.P.Q.2d at 1020.

⁶⁸ *Id.*, 43 U.S.P.Q.2d at 1021.

⁶⁹ *Id.*, 43 U.S.P.Q.2d at 1021.

Finally, consider *PPG Industries v. Guardian Industries Corp.*⁷⁰ In this case the disputed claim term was “SO₃.”⁷¹ The plaintiff argued that it referred to *all* sulfur compounds including iron sulfide.⁷² The defendant argued that the term referred only to dissolved sulfate retained in the glass composition.⁷³ The term was not defined in the specification.⁷⁴ From a distance, it is difficult to imagine a scenario in which extrinsic evidence is *less* objectionable. Expert testimony seems absolutely crucial to explain how one skilled in the relevant art would understand the disputed term; indeed, both candidates seem plausible. In fact, the trial court permitted *PPG* to introduce expert testimony on this issue.⁷⁵ What is interesting *204 though is that the Federal Circuit did not rely upon extrinsic evidence. Instead, it held based solely on a careful examination of the specification that the term SO₃ must refer only to dissolved sulfates.⁷⁶ The court observed that the specification states that “[r]esidual amounts [of SO₃] in the glass can vary and have no significant effect on the properties of the glass product.”⁷⁷ Yet as both parties agreed, iron sulfide is a strong colorant in glass; in other words, it can have a “significant effect” on glass properties.⁷⁸ Therefore, “SO₃,” whatever it means, cannot *include* iron sulfide, since the statement in the specification states that SO₃ in small amounts has no significant effect on glass properties. Following this analysis, the term “SO₃,” if it were to mean all sulfur species including iron sulfide, would render the specification contradictory since it would refer to SO₃ in *two* different ways (i.e., SO₃ cannot both have no significant effect and have a significant effect).⁷⁹ Therefore, this construction must be eliminated.⁸⁰ Also observe that the Federal Circuit never actually defined the term “SO₃” but just decreed that, whatever it meant, it could not refer to *all* sulfide species; the plaintiff’s proffered construction was eliminated, therefore resolving

⁷⁰ *PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351, 48 U.S.P.Q.2d 1351 (Fed. Cir. 1998).

⁷¹ *Id.* at 1356, 48 U.S.P.Q.2d at 1355.

⁷² *Id.*, 48 U.S.P.Q.2d at 1355.

⁷³ *Id.*, 48 U.S.P.Q.2d at 1355.

⁷⁴ *Id.*, 48 U.S.P.Q.2d at 1355.

⁷⁵ *Id.* at 1357, 48 U.S.P.Q.2d at 1356.

⁷⁶ *Id.* at 1356, 48 U.S.P.Q.2d at 1357.

⁷⁷ *Id.*, 48 U.S.P.Q.2d at 1355.

⁷⁸ *Id.*, 48 U.S.P.Q.2d at 1355.

⁷⁹ *Id.* at 1357, 48 U.S.P.Q.2d at 1356-57.

⁸⁰ *Id.* at 1358, 48 U.S.P.Q.2d at 1357.

the claim construction issue.⁸¹

Remember that claim construction is just a predicate to the ultimate question of infringement, which is a binary decision; either the accused device infringes or it does not. The patent owner will urge a construction that will capture the accused device within the scope of the claims, and of course the accused infringer will offer one that excludes it. The trial judge correctly performs the claim construction task by selecting one of these. There is little point in doing more than this; principled construction of a legal document should mean not seeking more precision or generality than you need for the particular task at hand. The cases discussed in this section reflect that each case is remarkable in its emphasis on identifying the implausible interpretation, rather than on comparing the two to determine the best one, or worse, embarking on an unbounded search for the singular, correct meaning. For example:

**205 [Maxwell]* [T]o accept Maxwell’s claim interpretation that the inside lining of the shoe is part of the tab, we would have to ignore the claim limitations that require⁸²

[Markman] [T]he claim phrase “detect and localize spurious additions to inventory as well as spurious deletions therefrom” does not make sense using Markman’s definition of “inventory.”⁸³

[PPG Industries] [A]n interpretation that includes all sulfur compounds would call into question the accuracy of the statement in the specification⁸⁴

Additionally, if the Federal Circuit wanted its judges to ransack the record in some sort of cryptographic quest for the singular correct meaning, then it would not have placed such tight restrictions on the use of extrinsic evidence, as indeed it did in *Markman* and *Cybor*.⁸⁵ In fact, if one is trying to crack a code, then *all* interpretive

⁸¹ In *PPG*, the Federal Circuit never admonished the trial court for relying on extrinsic evidence, probably because the trial court got the right answer, like *Markman* but unlike *Vitronics*; nevertheless, it is very clear that the Federal Circuit did *not* rely upon that extrinsic evidence in *PPG*.

⁸² *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1105, 39 U.S.P.Q.2d 1001, 1005 (Fed. Cir. 1996).

⁸³ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 971, 34 U.S.P.Q.2d 1321, 1323 (Fed. Cir. 1995) (en banc), *aff’d*, 116 S. Ct. 1384, 38 U.S.P.Q.2d 1461(1995).

⁸⁴ *PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351, 1356, 48 U.S.P.Q.2d 1351, 1355 (Fed. Cir. 1998).

⁸⁵ *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 46 U.S.P.Q.2d 1169 (Fed. Cir. 1998).

sources should be freely available without restriction, which in this case, they are not. Therefore, what the cases presented in this section (collected in Table A) demonstrate is that a routine and indeed preferred technique of claim construction is to check each proffered construction against the text and eliminate one of the two proffered constructions that renders the patent internally incoherent. This technique is now firmly installed in the Federal Circuit claim construction jurisprudence.

Finally, it should come as no surprise that the Federal Circuit's harsh proscriptions on extrinsic evidence are found in the cases discussed in this section cases in which the claim construction dispute is easiest to resolve. More to the point, the authors of *Markman*, *Vitronics*, and most recently, *Cybor*, appear to *206 believe that disputes requiring extrinsic evidence occur far too infrequently, if ever, to justify an exception to claim construction jurisprudence. For instance:

[W]hile credibility determinations theoretically could play a role in claim construction, the chance of such an occurrence is "doubtful"⁸⁶

[T]he specification is ... usually dispositive ... it is the single best guide to the meaning of a disputed term.⁸⁷

In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term.⁸⁸⁸⁹

In this next section, a second category of cases shall be examined. These cases involve situations where *both* proffered constructions produce a plausible reading of the text and are not soluble using the *Markman* model. One purpose of this examination is to assess whether the Federal Circuit's proscriptions on extrinsic evidence are justified.

III. The Multiform model

⁸⁶ *Id.* at 1455-56, 46 U.S.P.Q.2d at 1174 (citing *Markman*, 116 S.Ct. at 1395, 38 U.S.P.Q.2d at 1469).

⁸⁷ *Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576, 1582, 39 U.S.P.Q.2d 1573, 1577 (Fed. Cir. 1996).

⁸⁸ *Id.* at 1583, 39 U.S.P.Q.2d at 1577.

⁸⁹ Vary or contradict with respect to what? Taken literally, this seems to mean that extrinsic evidence can only be relied upon to corroborate or to provide meaning when the intrinsic record is silent or too self-conflicting to reliably converge on a single meaning (i.e., the intrinsic record, at different parts, supports both proffered constructions). In other words, *Markman* and progeny appear to prohibit extrinsic evidence in those instances in which it would actually be probative.

Aside from the *Markman* family, a second distinct and distinguishable line of cases has coalesced into at least a tendency and at most a legal standard. Exemplary cases from this line shall be discussed in detail. Readers can then determine for themselves whether these cases suggest a discernible pattern, and whether this pattern implies a legal rule. In this Article, the interpretive strategy *207 applied in this particular family of Federal Circuit decisions shall be referred to as the “*Multiform* model.” The cases discussed in this section are listed in Table B.

The characteristics that define the *Multiform* model cases exhibit the following pattern. First, the patent owner urges the dictionary definition (either layman’s or technical) of the disputed claim term; the accused infringer proffers a narrower construction, but one subsumed within the dictionary definition. Second, the Court refuses the ordinary dictionary definition of the term, even though the term is not expressly defined in the specification, and ultimately selects the narrower of the two proffered constructions.⁹⁰ Third, although both proffered constructions produce a coherent and plausible reading of the patent--they are *not* soluble by applying the *Markman* model--the Federal Circuit nonetheless resolves the dispute *without* extrinsic evidence. In each case comprising this family, the Federal Circuit deliberately *avoids* extrinsic evidence even though it is available, is probative, and was relied upon by the trial court.⁹¹ Finally, in each instance, the Court selects the proffered construction in accordance with the *stated objectives or purpose of the invention*, and it rejects the

⁹⁰ Indeed, this trend towards narrower constructions from the Federal Circuit has been noted by others. *See*, Patrick J. Flinn and Keith E. Broyles, *The Patent Prairie Gets Fenced In: The Court’s Trend Seems to Be Towards Limiting Patent Claims*, NAT’L L. J., C4, Feb. 8, 1999.

⁹¹ One apparent exception is *Fromson v. Anitek Printing Plates Inc.*, 132 F.3d 1437, 45 U.S.P.Q.2d 1269 (Fed. Cir. 1997); however, though extrinsic evidence was admitted and perhaps relied upon at trial, the Federal Circuit mentioned it only to corroborate its construction produced solely from the intrinsic record as evidenced by this remark from the *Cybor* majority: “In *Fromson*, the district court ‘relied primarily on the ‘754 specification’ [citing, *Fromson*, 132 F.3d at 1442, 45 U.S.P.Q.2d 1269] Although the extrinsic record--expert testimony, prior art, and scientific tests--confirmed the district court’s claim construction, it was directed primarily to whether Anitec’s thin, nonporous oxide layer infringed the claims.” *Cybor Corporation v. FAS Technologies, Inc.*, 138 F.3d 1448, 1455, 46 U.S.P.Q.2d 1169, 1197 (Fed. Cir. 1998).

proffered construction inconsistent with those stated objectives.⁹²

***208** The first of these cases is *Multiform Dessicants, Inc. v. Medzam LTD.*⁹³ In *Multiform*, the disputed claim term was “degrade” in a claim directed to a device for controlling spilled liquids.⁹⁴ The claimed device is a packet that consists of a degradable envelope which holds an absorbing material and a treating material.⁹⁵ This packet can be placed near a container filled with a hazardous liquid, so that if the liquid spills, it contacts the envelope, and eventually “degrades” it, hence releasing the absorbing and treating material, which acts on the spilled liquid.⁹⁶ In the preferred embodiment of the invention, the packet envelope is made of a soluble material, which readily dissolves

⁹² The Federal Circuit has decided several other cases after *Markman* in which it applied an interpretive strategy very similar to the *Multiform* model, though the cases did not have all of the characteristics that I identified above. *See*, *Bell & Howell Document Management Prods. Comp. v. Altek Sys.*, 132 F.3d 701, 706, 45 U.S.P.Q.2d 1033, 1038 (Fed. Cir. 1997) (selecting the *broader* of the two proffered constructions, though essentially applying the *Multiform* model, “The specification sets forth that the invention is an improvement over, *inter alia*, the paper-ribbed prior art because it does not use a separate adhesive layer between the ribs and the panels [I]t is the main object of this invention to provide ... a jacket for microfilm wherein the channels are defined by in situ ribs which are integral with the panels of the jacket”); *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1160, 42 U.S.P.Q.2d 1577, 1587 (Fed. Cir. 1997) (construing the term “greater than 3% elasticity,” which obviously had no dictionary definition; moreover, the two proffered constructions were of approximately equal scope, “[O]ur interpretation of the claims is consistent with and furthers the purpose of the invention.”); *Novo Nordisk of North America Inc. v. Genentech Inc.*, 77 F.3d 1364, 1370, 37 U.S.P.Q.2d 1773, 1778 (Fed. Cir. 1996) (deciding the case based upon the *Multiform* model, though neither party relied upon the ordinary dictionary definition. Quoting the applicants’ remarks made during prosecution, the Court stated “the present invention provides a basis for dispensing with the necessity of an additional processing step. It, for the first time, provides a convenient method for producing in a host system a protein which is in mature form, having been expressed directly by means of this invention.”); *Pall Corp. v. Micron Separations Inc.*, 66 F.3d 1211, 1217, 36 U.S.P.Q.2d 1225, 1228 (Fed. Cir. 1995) (selecting the *broader* of the two proffered constructions but rejecting the narrower dictionary definition, “We too conclude ... that ‘skinless’ is properly construed as a performance characteristic”).

⁹³ *Multiform Dessicants, Inc. v. Medzam, LTD.*, 133 F.3d 1473, 45 U.S.P.Q.2d 1429 (Fed. Cir. 1998).

⁹⁴ *Id.* at 1475, 45 U.S.P.Q.2d at 1430.

⁹⁵ *Id.*, 45 U.S.P.Q.2d at 1431.

⁹⁶ *Id.*, 45 U.S.P.Q.2d at 1431.

upon contact with most liquids.⁹⁷ The absorbing material is preferably sodium polyacrylate, a known absorbent, which expands and forms a gel on contact with a liquid; the treating material can be a deodorizer, for instance.⁹⁸

Medzam, the accused infringer, sold a similar packet, but the envelope was made of a porous material (like the kind used in teabags).⁹⁹ This causes the Medzam packet to work a little differently than Multiform's preferred embodiment. Hence, when the Medzam envelope contacts a spilled liquid, the absorbing material inside the envelope expands and *bursts* the envelope (rather than *dissolves* as in the Multiform envelope), releasing the entire contents for further absorbing and *209 treatment.¹⁰⁰ Medzam argued that the mode of releasing the envelope contents--i.e., bursting--was excluded from the meaning of the claim term "degradable."¹⁰¹ This term, it argued, referred to dissolution, as evidenced by the embodiments recited in Multiform's specification.¹⁰²

Multiform's rejoinder was very simple. It urged that the ordinary layman's dictionary definition of the term "degradable" must control, absent an express definition in the specification to the contrary (there was none).¹⁰³ Therefore, Medzam argued, the term had its ordinary meaning, which was: "[a]ny loss in containment function of the envelope."¹⁰⁴ So, Medzam's proffered construction was not repugnant to Multiform's, indeed, it was a narrower definition, subsumed within it. In addition, both interpretation produced a coherent reading of the specification.

⁹⁷ *Id.* at 1477, 45 U.S.P.Q.2d at 1432.

⁹⁸ *Id.* at 1475, 45 U.S.P.Q.2d at 1431.

⁹⁹ *Id.*, 45 U.S.P.Q.2d at 1431.

¹⁰⁰ *Id.* at 1476, 45 U.S.P.Q.2d at 1431.

¹⁰¹ *Id.* at 1477, 45 U.S.P.Q.2d at 1431.

¹⁰² *Id.*, 45 U.S.P.Q.2d at 1431.

¹⁰³ *See, e.g.,* Vitronics Corp. v. Conceptronics, Inc., 90 F.3d 1576, 1582, 39 U.S.P.Q.2d 1573, 1576 (Fed. Cir. 1996) ("[W]ords in a claim are generally given their ordinary and customary meaning"); *see also*, York Products., Inc. v. Central Tractor Farm & Family Ctr., 99 F.3d 1568, 1572, 40 U.S.P.Q.2d 1619, 1622 (Fed.Cir.1996) ("Without an express intent to impart a novel meaning to claim terms, an inventor's claim terms take on their ordinary meaning."); Hoechst Celanese Corp. v. BP Chemicals Ltd., 78 F.3d 1575, 1578, 38 U.S.P.Q.2d 1126, 1129 (Fed. Cir. 1996) ("A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of the invention").

¹⁰⁴ Multiform Dessicants, Inc. v. Medzam, LTD., 133 F.3d 1473, 1477, 45 U.S.P.Q.2d 1429, 1432 (Fed. Cir. 1998).

The trial court refused to assign the ordinary dictionary meaning to the disputed term, and agreed with *Medzam*.¹⁰⁵ It defined the term “degradable” more narrowly than its general dictionary definition, “[i]n light of the mode of action of the accused device ...”¹⁰⁶ The Federal Circuit agreed.¹⁰⁷ To reach this construction, the trial court (and Federal Circuit) relied only upon the intrinsic evidence and almost exclusively upon the specification.¹⁰⁸ Thus, in *Multiform*, the patent owner urged the ordinary dictionary definition of the disputed language; the *210 Federal Circuit refused it, and without relying on extrinsic evidence, selected a narrower construction based explicitly on the stated objectives of the invention.

Next, consider *O.I. Corp. v. Tekmar Co.*¹⁰⁹ In *O.I. Corp.*, the disputed claim term was “passage” in a claim directed to a device for removing water vapor from a sample prior to analysis by gas chromatography.¹¹⁰ In the preferred embodiment of the invention, the passage (the interior of the tube) is threaded rather than smooth.¹¹¹ The reason for the threading is to induce a swirling motion of the sample, which promotes removal of the water from the sample.¹¹²

The Tekmar device fits this description, but the internal walls of the tube are *smooth* rather than *threaded*.¹¹³ Predictably, Tekmar argued that the term “passage” referred to a threaded (or similar configuration) but not to a smooth internal configuration.¹¹⁴ The patent owner, O.I. Corp. argued that the disputed term “passage” had its ordinary dictionary meaning.¹¹⁵ The trial court again rejected the dictionary

¹⁰⁵ *Id.* at 1478, 45 U.S.P.Q.2d at 1433.

¹⁰⁶ *Id.*, 45 U.S.P.Q.2d at 1433.

¹⁰⁷ *Id.*, 45 U.S.P.Q.2d at 1433.

¹⁰⁸ *Mezdam* highlighted a portion of the prosecution history favorable to its position, which was recited in the Federal Circuit’s opinion; this evidence was very weak.

¹⁰⁹ *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 42 U.S.P.Q.2d 1777 (Fed. Cir. 1997).

¹¹⁰ *Id.* at 1580, 42 U.S.P.Q.2d at 1779.

¹¹¹ *Id.* at 1581, 42 U.S.P.Q.2d at 1780.

¹¹² *Id.*, 42 U.S.P.Q.2d at 1780.

¹¹³ *Id.* at 1582, 42 U.S.P.Q.2d at 1781.

¹¹⁴ *Id.* at 1580, 42 U.S.P.Q.2d at 1779.

¹¹⁵ *O.I. Corp. v. Tekmar Co.*, 115 F.3d at 1580, 42 U.S.P.Q.2d at 1779.

meaning and selected the narrower meaning urged by the accused infringer.¹¹⁶ To do that, it relied primarily upon a portion of the patent specification in which the inventors recited the advantages of the invention. As with the threaded or ridged configuration, the conical shape causes a swirling effect on the water vapor from the analyte slug. [I]n contrast, the prior art has generally specified that the pneumatic tubing and passageways between the trap and GC are smooth-walled.”¹¹⁷ Just like in *Multiform*, the *O.I. Corp.* panel, without relying on extrinsic evidence, rejected the broader dictionary definition and adopted a narrower subset of that meaning, based solely upon the portion of the specification that recites the purpose of the invention.

Similarly in *Mantech v. Hudson*, the disputed claim term was “well” in a claim directed to monitoring the movement and levels of groundwater *211 contamination.¹¹⁸ The patent owner, Mantech, argued that the term “well” had its ordinary dictionary meaning (modified slightly for this context), which was “a device that provides access to groundwater.”¹¹⁹ Neither parties’ expert disputed this general meaning of the term.¹²⁰ Hudson argued that as the term was used in the context of the patent, it referred to a structure that enabled either monitoring the groundwater or injecting substances into the groundwater.¹²¹ The Federal Circuit accepted this construction.¹²² As in *Multiform* and *O.I. Corp.*, the *Mantech* panel rejected the dictionary definition and adopted a construction subsumed within, but not inconsistent with, that broader meaning. It developed that construction by a careful examination of the patent specification to determine the invention’s purpose.

In addition to the three cases discussed in this section, many more cases in which the Federal Circuit has applied the *Multiform* model after *Markman* are described in pertinent part in Table B. One should also be aware that though each case that I discuss in this section was decided after *Markman*, the *Multiform* model has an established pedigree. Numerous panels have relied upon this Model to decide pre-*Markman*

¹¹⁶ *Id.* at 1581, 42 U.S.P.Q.2d at 1779.

¹¹⁷ *Id.*, 42 U.S.P.Q.2d at 1780-81.

¹¹⁸ *Mantech Environmental Corp. v. Hudson Env'tl. Servs., Inc.*, 152 F.3d 1368, 47 U.S.P.Q.2d 1732 (Fed. Cir. 1998).

¹¹⁹ *Id.* at 1370, 47 U.S.P.Q.2d at 1734.

¹²⁰ *Id.*, 47 U.S.P.Q.2d at 1734.

¹²¹ *Id.* at 1372, 47 U.S.P.Q.2d at 1734.

¹²² *Id.* at 1375, 47 U.S.P.Q.2d at 1738.

disputes.¹²³

***212** Again, one remarkable feature of the *Multiform* model cases is that they are decided without extrinsic evidence. In each of these cases, the patent owner argued that the disputed term's meaning was coextensive with its ordinary or technical dictionary definition. The accused infringer argued that it was narrower--not repugnant to or outside of that definition--but subsumed within it. The significance of this is that the term's general meaning to the PHOSITA--i.e., its "fixed meaning"--was *not in dispute*. The debate was conducted entirely within a single, agreed-upon lexical plane. What was in dispute was how the term was used *in the text*. The key distinction here is between *intra*- and *extra*-textual conflicts. So *Multiform*, and cases like it, stand for the proposition that arguments that narrowly focus upon how a term is used in a patent are best resolved by an examination of the patent itself.

If the *Multiform* model is an emerging trend in Federal Circuit claim construction jurisprudence, then there should be reasons for it, and indeed there are: First, the

¹²³ See, e.g., *Hoganas AB v. Dresser Indus. Inc.*, 9 F.3d 948, 951, 28 U.S.P.Q.2d 1936, 1939 (Fed. Cir. 1993) (construing the term "straw shaped" whether it requires hollowness or not: "Although the documentation does not expressly identify the hollowness characteristic as contributing to the inventive concept, it is not inconsistent with that concept either. Moreover, a significant and possibly critical contribution for this feature can be readily inferred: it permits the release of steam before the elements are burned away"); *Carroll Touch, Inc. v. Electro Mechanical Systems, Inc.*, 15 F.3d 1573, 1578, 27 U.S.P.Q.2d 1836, 1840 (Fed. Cir. 1993) (construing the term "spaced apart" whether it requires that the surfaces be spaced apart over their entire surface area: "Were the claimed invention to have intersecting beam surfaces, in those areas where the beams intersected the invention would be unable to achieve its stated objectives of distinguishing valid inputs from stray inputs caused by small foreign objects or determining the velocity of an object approaching the touch panel."); *The Read Corp. v. Portec, Inc.*, 970 F.2d 816, 823, 23 U.S.P.Q.2d 1426, 1432 (Fed. Cir. 1992) (construing the term "closed to the ground" on whether the object must actually touch the ground: "The prosecution history describes the short end's function of acting as a barrier [T]hus the specification indicates an "end closed to the ground" means sufficiently closed to achieve those functions."); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987, 6 U.S.P.Q.2d 1601, 1604-05 (Fed. Cir. 1988) (construing the term "plasticizer" whether it refers to just external or both internal and external plasticizers: "Nowhere does the specification of the '487 patent teach that external plasticizers must be used. On the contrary, some internally plasticized polymers are expressly disclosed in the specification. The emphasis is on the suitability of any plasticizer that will achieve the specified properties, not on the particular class of plasticizer."); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 450, 230 U.S.P.Q. 416, 421 (Fed. Cir. 1986) (construing the term 'smooth,' "[w]e hold that smooth means smooth enough to serve the inventor's purposes, i.e., not to inflame or irritate the eyelid of the wearer or be perceived by him at all when in place.").

Multiform model may reflect the Federal Circuit's growing impatience with poor claim drafting--either deliberate or inadvertent-- as well as with patent owners who during litigation, urge for constructions that are far broader than either the inventor or draftsman ever dreamed possible. This view is evidenced in more than a few recent Federal Circuit decisions. For instance, consider these remarks from Judge Clevenger in *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*:

Here, too, we have expended significant effort endeavoring to ascertain the proper construction of the term "pusher assembly" in claim 24. As has already been noted, the '519 specification provides minimal guidance on this question. Similarly, as U.S. Surgical points out, the Tompkins' specification which originated the term is of little, if any, help. Without more explicit alternatives, we have been forced to spend a significant quantity of time carefully sifting through each piece of the reissue prosecution history made part of *213 the appellate record in an effort to discover the term's proper meaning.¹²⁴

Similarly, Judge Nichols has also expressed the Federal Circuit's obvious sense of frustration: "We are up against what we must realistically consider a growing inability of speakers and writers, lawyers, technicians, and laymen, to say what they intend to say with accuracy and clarity."¹²⁵

Second, the *Multiform* model appears to be a deliberate, coherent strategy to adhere to *Markman*'s primary mandate. Again, a defining characteristic of the *Multiform* model cases is that they are resolved without extrinsic evidence even though both proffered constructions are plausible; they are genuinely close cases. *Markman* also insists that the trial court's construction preserve the text's internal coherence. Clearly, the *Multiform* model executes both of those directives. These cases produce claim constructions without extrinsic evidence, and do so by eliminating proffered constructions that are inconsistent with the purpose or stated objectives of the invention.

A third possible reason for the emergence of the *Multiform* model is compromise. The interpretive strategy distilled from the *Multiform* model cases appears to be a compromise strategy between the two competing factions within the Federal Circuit

¹²⁴ *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1581, 40 U.S.P.Q.2d 1019, 1026 (Fed. Cir. 1996).

¹²⁵ *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1583, 6 U.S.P.Q.2d 1557, 1563 (Fed. Cir. 1988) (Nichols, J., dissenting).

strategy for resolving difficult cases.¹²⁶ In September of 1995, the *214 Federal Circuit

¹²⁶ The post-*Markman* Court does not always rely upon the *Multiform* model--even in those instances when it is applicable--in fact, on two occasions it has rejected it outright. *See, York Products, Inc. v. Central Tractor*, 99 F.3d 1568, 1573, 40 U.S.P.Q.2d 1619, 1622 (Fed. Cir. 1996) (construing the phrase “a substantial part of the entire height thereof” [in a claim directed to a protective liner for a pickup truck bed] to determine to how much of the height the ridge members must extend; the plaintiff urged that the term means only “[a]mple extension to accomplish the purposes of locking loads.” Judge Rader, writing for the majority, rejected this interpretation: “The language and syntax of the claim preclude a functional definition of ‘substantial part.’” Later he said: “This redraft [urged by the plaintiff] would essentially strip many words in the claim of their meaning.”); *Hoechst Celanese Corp. v. BP Chemicals Ltd.*, 78 F.3d 1575, 1579, 38 U.S.P.Q.2d 1126, 1129-30 (Fed. Cir. 1996) (construing the term “dimension,” which either referred to linear measure [i.e., the resin beads shrunk by no more than 50% of their size based on diameter] or volume [the resin beads shrunk by no more than 50% of their size based on volume]. That the disputed term referred to volume was supported by reference to the objectives of the invention specification. For example, according to Hoechst’s expert: “[I]t is clearly the objective of this patent to distinguish between a resin that works because it has a porosity independent of swelling ... and another type of resin that depends upon swelling.” Judge Newman, writing for the majority, rejected this construction, primarily on the ground that if the functional definition were selected, then the major independent claim would exclude the preferred embodiment. The canon that interpretations that place the preferred embodiment outside the scope of the claim are to be avoided, is perhaps the strongest canon in patent law.); *See, e.g., Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576, 1583, 39 U.S.P.Q.2d 1573, 1578 (Fed. Cir. 1996) (An interpretation of a patent’s claims that would exclude from their scope “a preferred [and indeed only] embodiment ... is rarely, if ever, correct and would require highly persuasive evidentiary support”); *See also, e.g., Hoechst Celanese*, 78 F.3d at 158, 38 U.S.P.Q.2d 1126, 1130 (“[I]t is unlikely that an inventor would define the invention in a way that excluded the preferred embodiment, or that persons of skill in this field would read the specification in such a way.”); I am aware of only one case in which this canon has been violated: *Exxon Chemical Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 35 U.S.P.Q.2d 1801 (Fed. Cir. 1995). In both *York Products* and *Hoechst*, the plaintiff’s proffered construction was rejected as in the *Multiform* model cases. Moreover, in *York Products*, the plaintiff’s interpretation would have read words out of the claim, while in *Hoechst*, the plaintiff’s construction would have violated the strong canon discussed above. Finally in *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, the majority adopted a construction of the term “plastic flow temperature above 120°” in an invention directed to a vermin trap comprised of a flat surface coated with a pressure-sensitive adhesive. The disputed focused upon how parameter referred to in the claim term was measured. The majority (Judges Clevenger and Rich) concluded that a plastic flow temperature above 120° meant that the adhesive on the sheet must resist flow when exposed for 24 hours at a temperature of 120° and when the sheet is suspended in both horizontal and vertical (upside down) orientations. Judge Rader disagreed (i.e., his dissent actually applied the *Multiform* model). Thus, he relied upon portions of the intrinsic record showing that the

decided *Markman*, *en banc*. Of the twelve sitting judges, eight joined the majority opinion (written by then-Chief Judge Archer, who also authored the majority opinion in *Cybor*). Judges Mayer and Rader each filed concurring opinions; and Judge Newman filed a 27-page dissent. *Markman* did not provide a uniform standard for claim construction, so the Federal Circuit less than three years later decided to hear the matter again *en banc*, this time in *Cybor v. FAS Technologies*. *Cybor* did little to assure the patent bar that the Federal Circuit would apply a consistent claim construction standard from one panel to the next, as *215 evidenced by the voting alignment in *Cybor*.¹²⁷ Of the 12 judges who heard the case, five judges either wrote separately or joined a concurring opinion.¹²⁸

Subsequently, two disparate factions have emerged with respect to appellate deference to extrinsic evidentiary findings made at the trial level: Judges Mayer, Newman, Rader, Plager, and Bryson in one group; and Judges Rich, Gajarsa, Michel, Lourie, Clevenger, Shall, and Archer in the other.¹²⁹ Notice the authorship of the twelve *Multiform* model cases recited in Table A. Six of the majority opinions were written by judges from one faction, and six from the other.

So will the *Markman* model work in every case? No. That the *Markman* model is not applicable in some instances is not, however, a fair argument against its use. Besides, the *Multiform* model is a second filter in the event that the *Markman* model is

invention was directed to solving the problem of conventional traps whose adhesive melted (hence flowed) during shipping. The inventors learned that the maximum ambient temperature encountered during shipping was 120°; this temperature was typically maintained for about 16 hours (at most), which corresponded to a normal day minus eight non-daylight hours (hence cooler temperatures). Hence, Judge Rader argued, 16 not 24 hours was a far more relevant index to measure resistance to flow at 120°, since at this temperature an embodiment of the invention (or an accused device) would perform the stated objectives or purpose of the invention. 106 F.3d 1563, 41 U.S.P.Q.2d 1641.

¹²⁷ To be fair, *Markman* and *Cybor* are directed at slightly different issues, though with substantial overlap. In *Markman*, the primary issue was whether claim construction was a judge or jury question. In *Cybor*, the issue was the proper standard of review in claim construction disputes, or more precisely, the proper degree of deference owed to the trial court's factual findings (extrinsic evidence) in the context of a claim construction disputed. Hence though this issue was decided in *Markman*--i.e., *Markman* decreed a *de novo* standard of review for claim construction disputes--it was not actually the center of the dispute, as it was in *Cybor*.

¹²⁸ *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 46 U.S.P.Q.2d 1169 (Fed. Cir. 1998).

¹²⁹ Judge Archer took senior status between the time that *Markman* and *Cybor* were decided *en banc*. Nevertheless, the Author has included him here, because he was the author of both majority *en banc* opinions.

inapplicable. Indeed, the Federal Circuit frankly acknowledging that not every claim construction dispute is the same, and then applying the correct precedent (interpretive strategy) to resolve the dispute, would go a long way towards achieving the stability in this area of law. The Federal Circuit, the patent bar, and its clients, so desperately need this stability.

IV. Distinguishing Legal from Interpretive Matters

The *Multiform* model cases are more difficult to resolve than *Markman* model cases. Are there cases in which neither model is applicable? Is extrinsic evidence necessary to resolve those disputes?

***216** First, consider *Athletic Alternatives Inc. v. Prince Mfg. Inc.*¹³⁰ In this dispute, the patent at issue was directed to a novel tennis racket, or more precisely to the tennis racket's arrangement of strings on the racket face.¹³¹ In an ordinary string pattern, the string holes all lie along a single plane all the way around the racket face. The patent owner AAI discovered that if the strings are "splayed"--i.e., if the string holes are arranged alternatively above and below a central plane--then the racket's user can impart greater spin on the ball.¹³² One key parameter in this regard is the "offset distance" or the distance between a string hole and a central plane.¹³³ Also important is the *number* of offset distances, which is the number of different distances that the offset holes varied from the central plane.¹³⁴ Defendant Prince's racket had only two offset distances.¹³⁵ The claim-in-suit required that the offset distance "varies between" minimum and maximum values.¹³⁶ Prince argued that this referred to at least *three* offset distances (i.e., baseline value, minimum, and maximum).¹³⁷ According to the patent owner, AAI, this language

¹³⁰ *Athletic Alternatives Inc. v. Prince Mfg. Inc.*, 73 F.3d 1573, 37 U.S.P.Q.2d 1365 (Fed. Cir. 1996).

¹³¹ *Id.* at 1576, 37 U.S.P.Q.2d at 1369.

¹³² To visualize this plane, imagine cutting a tennis racket lengthwise into two identical halves, so that two mirror-image pieces result. A prior art tennis racket has all of its string holes lying along that axis; the AAI racket has some holes that lie above that axis, and some below it.

¹³³ *Athletic Alternatives Inc.*, 73 F.3d at 1577, 37 U.S.P.Q.2d at 1367.

¹³⁴ *Id.*, 37 U.S.P.Q.2d at 1369.

¹³⁵ *Id.*, 37 U.S.P.Q.2d at 1369.

¹³⁶ *Id.*, 37 U.S.P.Q.2d at 1369.

¹³⁷ *Id.*, 37 U.S.P.Q.2d at 1370.

covered *two* offset distances as well as three or more.¹³⁸

The claims themselves provided no clues. The specification was also silent with respect to whether only two offset distances yields an operable embodiment of the invention, or whether it is included within the scope of the claims.¹³⁹ The prosecution history was a confusing mass of contradictory and irreconcilable remarks.¹⁴⁰ This dispute was truly in equipoise, which the Federal Circuit frankly conceded: “[T]he dispositive claim language on its face is susceptible to two *217 equally plausible meanings”¹⁴¹ What the Court did next was interesting. Judge Michel, writing for the majority, invoked section 112, paragraph 2 of the Patent Code, which states that the “[s]pecification shall conclude with one or more claims particularly pointing out and *distinctly* claiming the subject matter which the applicant regards as his invention.

Although statutory requirements of validity are routinely invoked as interpretive tools, section 112, paragraph 2 had not been invoked to solve claim construction problems, prior to *AAI*.¹⁴² From § 112, ¶ 2, Judge Michel extracted a notice requirement:

Were we to allow *AAI* successfully to assert the broader of the two senses of “between” against *Prince*, we would undermine the fair notice function of the requirement that the patentee distinctly claim the subject matter disclosed in the patent from which he can exclude others temporarily. Where there is an equal choice between a broader and a narrower meaning of a claim, and there is an enabling disclosure that indicates that the applicant is at least entitled to a claim having the narrower meaning, we consider the notice function of the claim to be best served by adopting the narrower

¹³⁸ *Id.*, 37 U.S.P.Q.2d at 1372.

¹³⁹ *Id.*, 73 F.3d at 1579, 37 U.S.P.Q.2d at 1371.

¹⁴⁰ *Id.* at 1580, 37 U.S.P.Q.2d at 1371.

¹⁴¹ *Id.* at 1581, 37 U.S.P.Q.2d at 1370.

¹⁴² *See, e.g.*, *Genentech, Inc. v. The Wellcome Found. Ltd.*, 29 F.3d 1555, 1564, 31 U.S.P.Q.2d 1161, 1167 (Fed. Cir. 1994) (“An appropriate method for resolving [a claim construction dispute] is to avoid those definitions upon which the PTO could not reasonably have relied when it issued the patent.”); *Harris Corp. v. IXYS Corp.*, 114 F.3d 1149, 1153, 43 U.S.P.Q.2d 1018, 1021 (“[C]laims should be read in a way that avoids ensnaring prior art if it is possible to do so.”); *Texas Instruments Inc. v. United States Int’l Trade Comm’n*, 871 F.2d 1054, 1065, 10 U.S.P.Q.2d 1257, 1265 (Fed. Cir. 1989) (citing *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 932 (Fed. Cir. 1984)) (“Ambiguous claims, whenever possible, should be construed so as to preserve their validity.”); *but see*, *Hoganas AB v. Dresser Industries, Inc.*, 9 F.3d 948, 951, 28 U.S.P.Q.2d 1936, 1939 (Fed. Cir. 1993) (“It would not be appropriate for us now to interpret the claim differently just to cure a drafting error”).

meaning.¹⁴³

***218** *AAI* nicely illustrates the distinction between finding meaning and determining claim scope. The latter is a purely legal exercise, which asks not what the term means, but what the patent owner is entitled to claim. *AAI* also demonstrates that many claim construction disputes are not soluble on linguistic grounds. Often the disputed claim term will credibly support both proffered constructions, as we have seen in the *Multiform* model cases. However in *AAI*--unlike the *Multiform* model cases--both proffered constructions were consonant with the invention's purpose. A statutory requirement of patentability was invoked to place principled constraints upon the possible spectrum of meaning. Like the *Multiform* model, this approach undoubtedly evolved in response to *Markman*. It is directed to panels to identify and apply disciplined interpretive techniques to resolve difficult claim construction disputes without the use of extrinsic evidence and that preserve the internal coherence of the text.

In fact, *AAI* appears to be the seed of an emerging trend as evidenced by the fact that it has been closely followed in three recent Federal Circuit decisions. In addition, the *AAI* approach has been applied by judges on both sides of the *Markman/Cybor* debate. Likewise in *Ethicon Endo-Surgery Inc. v. U.S. Surgical Corp.* the Federal Circuit refused to extend the scope of meaning of the disputed claim term, reasoning that “[t]o the extent that the claim is ambiguous, a narrower reading which excludes the ambiguously covered subject matter must be adopted.”¹⁴⁴

¹⁴³ See *AAI* at 1581, 37 U.S.P.Q.2d at 1372 (Judge Michel said in the same opinion “[t]he primary purpose of the requirement [section 112, paragraph 2] is ‘to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their respective rights.’”) (citing, *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369, 37 U.S.P.Q.466 (1938)); see also, *McClain v. Ortmyer*, 141 U.S. 419, 424 (1891) (“The object of the patent law in requiring the patentee [to distinctly claim his invention] is not only to secure to him all to which he is entitled, but to apprise the public of what is still open to them.”); *Rengo Co. v. Molins Mach. Co.*, 657 F.2d 535, 551, 211 U.S.P.Q. 303, 320-21 (3d Cir. 1891) (other citations omitted).

¹⁴⁴ See *Ethicon Endo-Surgery Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 1581, 40 U.S.P.Q.2d 1019, 1026 (Fed. Cir. 1996) (citing *AAI*, F.3d at 1581, 37 U.S.P.Q.2d at 1372); See also, *Genentech Inc. v. The Wellcome Foundation Ltd.*, 29 F.3d 1555, 1564-65, 31 U.S.P.Q.2d 1161, 1168 (Fed. Cir. 1994) (this is a pre-*Markman* case similar to *AAI* and *Ethicon*: “[W]e are unwilling to say that the specification satisfies the enablement requirement of 35 U.S.C. § 112 ¶ 1 (1988) with respect to these broader definitions, or that the PTO could have relied on these definitions in issuing the patent.”) (citations omitted).

More recently, *AAI* was closely followed in *Digital Biometrics*.¹⁴⁵ There, the disputed claim term was “array” in a claim directed to a system of generating a computerized image of a human fingerprint.¹⁴⁶ The accused infringer’s system was virtually identical to Digital Biometrics’ except that the former system relied upon an array that did not store data in a digital format or in the memory.¹⁴⁷ Naturally *219 this difference formed the basis for the claim construction dispute. Though Digital Biometrics’ preferred embodiments showed an array storing the data in memory and in digital format, it nevertheless argued that since the term “array” was not expressly defined anywhere in the patent specification, its “ordinary” meaning was controlling.¹⁴⁸ They proffered a meaning straight from the standard technical dictionary in the field.¹⁴⁹ This definition was sufficiently broad to cover data *not* stored in digital format or in memory.

The panel rejected this argument.¹⁵⁰ What is interesting is how Judge Plager, writing for the majority, justified the result. First, he found support for Identix’ (the accused infringer’s) narrower interpretation in the specification--though this is of questionable relevance since Digital Biometrics could have relied upon the venerable canon that preferred embodiments do not define the scope of the invention--by holding that limitations in the specification should not be imported into the claims.¹⁵¹ This provided the basis for ultimately rejecting Digital Biometrics’ broader construction in favor of the narrower one, reasoning that, between the two, the narrower one more adequately complied with section 112, paragraph 1. Granted, this argument is always available in favor of the narrower construction; nevertheless, Judge Plager took the unusual (and very sophisticated) step of illustrating the questionable validity (on section 112, paragraph 1 grounds) of Digital Biometrics’ interpretation. By constructing a hypothetical claim based on that interpretation and analyzing the validity of that claim on section 112, paragraph 1 grounds, the Court found:

¹⁴⁵ *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 47 U.S.P.Q.2d 1418 (Fed. Cir. 1988).

¹⁴⁶ *Id.* at 1343, 47 U.S.P.Q.2d at 1424.

¹⁴⁷ *Id.* at 1342, 47 U.S.P.Q.2d at 1423.

¹⁴⁸ *Id.* at 1346, 47 U.S.P.Q.2d at 1426.

¹⁴⁹ *Id.*, 47 U.S.P.Q.2d at 1426.

¹⁵⁰ *Id.* at 1348, 47 U.S.P.Q.2d at 1426.

¹⁵¹ *See, e.g., Rolls-Royce Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 231 U.S.P.Q. 185 (Fed. Cir. 1986).

In view of the uncertainties surrounding the implementation of such an invention [described the hypothetical claim based on the patent's owner's proffered construction], we adopt the narrow claim construction that is clearly supported by the written description, and interpret "array" in claim 16 to mean a data structure stored in memory that is representative of a two-dimensional image.¹⁵²

***220** The *AAI* model was recently extended in *Brand Management*.¹⁵³ There, the disputed claim term was "sides" in a claim directed to a construction device for connecting building elements (e.g., 2x2 planks) used to build decks.¹⁵⁴ Plaintiff Brand Management argued that "sides" referred to just the internal sides; the accused infringer argued that it referred to both internal and external sides.¹⁵⁵ The *Brand Management* panel selected the narrower of the two proffered constructions once again, closely following the *AAI* decision: The term "sides" is ambiguous to the extent that it could be interpreted to refer to either internal sides or both internal and external sides. [F]aced with two competing interpretations that are equally tenable, we choose to reinforce the notice requirement by construing claim 1 narrowly.¹⁵⁶

The *AAI* family of cases compels the question whether the Federal Circuit intends for trial courts to apply this model before or after it allows extrinsic evidence. In other words, must the trial court invoke the *AAI* model immediately after exhausting the intrinsic record? Or is it first permitted to admit extrinsic evidence? If that provides no solution, then can the Court invoke the *AAI* technique? The answer to this question is important because the *AAI* model is applicable in *every single* claim construction dispute. In *AAI* itself, the court mentioned that no extrinsic evidence was available. Similarly, the authority following *AAI* did not provide an answer. For instance, from the *Digital Biometrics* panel:

[I]f after consideration of the intrinsic evidence there remains doubt as to the exact meaning of the claim terms, consideration of extrinsic evidence may be necessary to determine the proper construction. If a claim falls into this latter category, however, another claim construction canon comes into play. Because the applicant has the burden to "particularly point out and distinctly claim the subject matter which the applicant regards as his invention," 35 U.S.C. § 112, ¶ 2 (1994), if the claim is susceptible to a broader and a narrower meaning, and the narrower one is clearly supported by the intrinsic evidence while the broader one ***221** raises questions of enablement under §

¹⁵² *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1346, 47 U.S.P.Q.2d 1418, 1425 (Fed. Cir. 1998) (citing *AAI*, 73 F.3d at 1581, 37 U.S.P.Q.2d at 1372).

¹⁵³ *Brand Management, Inc. v. Sutherland Lumber Southwest Inc.*, 1997 U.S. App. LEXIS 15255 (Fed. Cir. 1997).

¹⁵⁴ *Id.* at *5.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.* at *8 (quoting *AAI*, 73 F.3d at 1581, 37 U.S.P.Q.2d at 1372).

112, ¶ 1, we will adopt the narrower of the two.¹⁵⁷

Whether a trial court can allow extrinsic evidence prior to invoking the *AAI* model deserves resolution by the Federal Circuit.

If extrinsic evidence was *ever* justified to resolve a claim construction dispute, then *AAI*, *Digital Biometrics*, and *Brand Management* are striking exemplars.¹⁵⁸ It is hard to imagine three cases in which the meaning of the disputed claim term was more in equipoise, and yet the Federal Circuit *still* did not rely on extrinsic evidence to resolve them.

If *Digital Biometrics* and *Brand Management* are reliable indicators, then the interpretive strategy decreed in *AAI* has become securely embedded in the Federal Circuit's claim construction jurisprudence.¹⁵⁹ Indeed, unlike the *Markman* and *Multiform* models, the *AAI* line of authority can be invoked to solve *any* claim construction dispute. Therefore, the principle established in *AAI* must be cautiously applied. The purpose of the discussion that follows is to suggest the limits of this principle.

Contrast *AAI* with *Specialty Composites v. Cabot Corp.*¹⁶⁰ There, the disputed claim term was “plasticizer,” a term of art in polymer chemistry.¹⁶¹ Plasticizers come in two types: internal and external.¹⁶² Neither the term “internal” nor “external” is used in the patent specification.¹⁶³ The patent discloses species of plasticizers that are all external plasticizers (but without using the term “external”) as the preferred embodiments.¹⁶⁴ Several species of internal plasticizers are obliquely mentioned, though not emphasized.¹⁶⁵ The patent owner *222 argued that “plasticizer” referred to both internal

¹⁵⁷ *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1344, 47 U.S.P.Q.2d 1418, 1424 (Fed. Cir. 1988).

¹⁵⁸ Collected in Table C.

¹⁵⁹ The Author is aware of only one case in which the Federal Circuit has cited and refused to apply the *AAI* approach: *Transco Prods., Inc. v. Performance Contracting, Inc.*, 1997 U.S. App. LEXIS 21294 (Fed. Cir. 1997).

¹⁶⁰ *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 6 U.S.P.Q.2d 1601 (Fed. Cir. 1988).

¹⁶¹ *Id.* at 986, 6 U.S.P.Q.2d at 1604.

¹⁶² *Id.* at 985, 6 U.S.P.Q.2d at 1603.

¹⁶³ *Id.* at 987, 6 U.S.P.Q.2d at 1604.

¹⁶⁴ *Id.*, 6 U.S.P.Q.2d at 1604.

¹⁶⁵ *Id.*, 6 U.S.P.Q.2d at 1604.

and external plasticizers.¹⁶⁶ The accused infringer urged that the term referred to only external plasticizers.¹⁶⁷ If *Specialty Composites* followed *AAI*, then it would have invoked section 112, paragraph 2 and reasoned that the inventor did not adequately disclose both types of plasticizers, and therefore the term shall be construed to satisfy section 112, paragraph 2's implicit notice requirement. Yet the *Specialty Composites* panel decided the case the other way.¹⁶⁸ Hence, despite the limited disclosure, the claim term "plasticizer" covers *both* internal and external plasticizers according to the Court.¹⁶⁹ Are *AAI* and *Specialty Composites* reconcilable?

Perhaps they are. The focus in *AAI* was upon the patent's disclosure--i.e., was a racket having two splay patterns adequately disclosed in the specification? Again, the Court said no. Recall that one can satisfy section 112's strictures in either of two ways: 1) through express disclosure in the specification; or 2) by relying upon the PHOSITA to furnish the teaching (i.e., under established Federal Circuit law, a patent specification incorporates by reference all that is well-known in the art to which the patent is directed, and so therefore the patent need not include that "background" information, and indeed preferably omits it).¹⁷⁰ Therefore, an implicit indifference curve is at work: the closer the particular element is to the invention's center of gravity, the greater the disclosure requirement. Put another way, if the particular claim element in dispute is a *novel* feature of the invention--i.e., if the invention, or part of it, resides in that element--then the PHOSITA will have no knowledge of it, since it is by definition "novel," and therefore not a well-known principle in the art. Therefore, the inventor must disclose it in the patent specification with particularity. This is precisely the scenario in *AAI*. The splay pattern was the heart of the invention, offset string holes in a tennis racket *was* the invention. The PHOSITA could not be expected to know whether a racket having only two offset distances would result in a functional embodiment of the invention. More precisely, the PHOSITA was unable to furnish that knowledge (if he was, then the of course, invention would fail for lack of novelty). Therefore, since *AAI*'s specification did not furnish that teaching, then it was unavailable to the *223 PHOSITA.¹⁷¹ The narrower construction was selected to preserve the patent's validity on the grounds of section 112,

¹⁶⁶ *Id.* at 986, 6 U.S.P.Q.2d at 1604.

¹⁶⁷ *Id.*, 6 U.S.P.Q.2d at 1604.

¹⁶⁸ *Id.* at 993, 6 U.S.P.Q.2d at 1609.

¹⁶⁹ *Id.* at 988, 6 U.S.P.Q.2d at 1606.

¹⁷⁰ *See, e.g.*, *Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys.*, 804 F.2d 659, 231 U.S.P.Q. 649 (Fed. Cir. 1986); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q. 81 (Fed. Cir. 1986); *see also*, *In re Buchner*, 929 F.2d 660, 661, 18 U.S.P.Q.2d 1331, 1332 (Fed. Cir. 1991) ("[U]nless the information is well known in the art, the application itself must contain this information").

¹⁷¹ That is, claims directed to those particular embodiments were not enabled.

paragraphs 1,2 grounds.

Now contrast *AAI* with *Specialty Composites* where the invention was for foam rubber earplugs. The advantage of the invention lay in the earplugs' compressibility, which allowed them to be squeezed between the thumb and forefinger and inserted into the ear canal, and their plasticity, which allowed them to return to original size so that they formed a reasonably tight seal around the ear canal (yet were easy to insert). In order to achieve the desired compressibility and plasticity, a "plasticizer" had to be added to the foam to permit it to be compressed, yet still have a sufficiently high rate of recovery to fill the ear canal. The Federal Circuit quite correctly believed that the choice of plasticizer type--internal or external--was of little consequence to the invention:

The emphasis is on the suitability of any plasticizer that will achieve the specified properties, not on the particular class of plasticizer. [T]he specification states: "Any flexible polymeric material which can be foamed so as to result in an ultimately formed earplug structure meeting the recovery rate and pressure criteria set forth herein above constitutes a satisfactory material of construction in the earplug of the invention."¹⁷²

What is quite clear from this passage is that the panel did not believe that the type of plasticizer was a crucial aspect of the invention because the inventor said that it was not, which is credible since it is like an admission against interest. Therefore, if it was not a novel feature of the invention, but rather an ancillary feature of an overall device of which the invention was also a part, then the PHOSITA could be invoked to furnish the requisite knowledge to fully practice the invention (i.e. to choose between internal and external plasticizers).

With these thoughts in mind, the patent owner in *AAI* was not permitted to rely upon generally known principles of the relevant art because such principles relating to the element in disputes did not exist (indeed if he purported to have invented them). On the other hand, the patent owner in *Specialty Composites* was allowed to rely upon the routine implicit teachings of the relevant art to complete the patent disclosure. In other words, the term "plasticizer" subsumes external and *224 internal plasticizers because the PHOSITA says it does and would know that either would yield an operable embodiment of the invention.

The point of this section is only to illustrate the boundaries of the principles set forth in *AAI*. *AAI* should not be relied upon to narrow a claim term in those instances in which established principles of the relevant technical discipline are available to supplement the term's meaning beyond the meaning supplied in the patent specification. These instances occur when the element in dispute is generally at the invention's periphery, rather than at its hub, where the PHOSITA's knowledge (in theory) falls to zero.

¹⁷² *Specialty Composites*, 845 F.2d 981, 6 U.S.P.Q.2d 1601.

Conclusion

Now the relationship between the three families of cases--the *Markman* model cases, the *Multiform* model cases, and the *AAI* model cases--is understood. In the *Markman*-type disputes, linguistic implausibility provides the solution. If both proffered constructions traverse this minimal hurdle, then it becomes irrelevant, and so a subsequent filter must be applied. In the *Multiform* model cases, the ordinary dictionary meaning is rejected in favor of a subset of that broader meaning, narrowed according to its use in the context of the patent, and on the ground that the narrower definition is more consistent with the stated objectives of the invention, or that the rejected interpretation is inconsistent with those objectives. Like the *Markman* model, the *Multiform* model generates its construction from the intrinsic record alone. In the *AAI* model cases, both proffered constructions are linguistically plausible, and both are roughly consistent with the purpose of the invention. Hence, between two equally plausible interpretations, the narrower one is selected by invoking a statutory ground of validity namely section 112.

What the prior discussion should at least illustrate is that not all claim construction disputes are alike. Different types of disputes have created different lines of authority; this heterogeneity should be accounted for in deciding claim construction cases. Three distinct lines of authority are chiseled from the block of the Federal Circuit's post-*Markman* precedent, which are now securely installed in the Federal Circuit's interpretive repertoire. Indeed, step-wise application of these three successive filters, beginning with the *Markman* model to resolve the easiest cases first, and ending with the *AAI* model in the most difficult cases--which resist *225 solution by the *Markman* and *Multiform* models--actually *defines* the Federal Circuit's claim construction approach in the post-*Markman* era.¹⁷³

¹⁷³ Application of this three-part algorithm to resolve claim construction disputes is a very good way for trial courts to avoid reversal.