United States District Court,
W.D. Pennsylvania.

DELTA FRANGIBLE AMMUNITION, LLC,
Plaintiff.
v.
SINTERFIRE, INC,
Defendant.

Aug. 25, 2008.

Russell D. Orkin, Kent E. Baldauf, Jr., Nathan J. Prepelka, Webb Law Firm, Pittsburgh, PA, for Plaintiff.

William F. Ward, Ward McGough, LLC, Pittsburgh, PA, Ali I. Ahmed, John F. Hornick, Louis M. Troilo, Stephen L. Peterson, Finnegan Henderson Farabow Garrett & Dunner LLP, Washington, DC, for Defendant.

MEMORANDUM ORDER

TERRENCE F. McVERRY**, District Judge.**

On November 8, 2006, this patent infringement case was referred to United States Magistrate Judge Francis X. Caiazza for pretrial proceedings in accordance with the Magistrates Act, 28 U.S.C. s.s. 636(b)(l)(A) and (B), and Rules 72.1.3 and 72.1.4 of the Local Rules for Magistrates.

On July 23, 2008, Judge Caiazza issued a Report (Doc. 75) recommending that the District Court construe the parties' disputed claim terms, "sintering" and "sintering temperature," to mean "the bonding of adjacent particles in a powder mass or compact by heating to a temperature below the melting point of the main constituent." *Id*. at 41. FN1

FN1. After Judge Caiazza issued his Report, this case was reassigned to United States Magistrate Judge Cathy Bissoon. *See* text Order dated Aug. 1, 2008. The reassignment has no effect on the District Court's review of the Report and Recommendation.

Service of the Report and Recommendation was made on the parties, and Defendant filed Objections on August 8, 2008. *See* Doc. 76.

After a *de novo* review of the pleadings and documents in the case, together with the Report and Recommendation and the Objections thereto, the following Order is entered:

AND NOW, on this 25th day of August, 2008, IT IS HEREBY ORDERED that, for the purposes of claim construction, the terms "sintering" and "sintering temperature" mean:

The bonding of adjacent particles in a powder mass or compact by heating to a temperature below the melting point of the main constituent.

The Report and Recommendation dated July 23, 2008 is adopted as the opinion of the District Court.

MAGISTRATE JUDGE'S REPORT AND RECOMMENDATION FN1

FN1. Before filing this Report as part of the public record, the undersigned has confirmed that none of the evidence addressed herein has been filed under seal pursuant to the parties' Stipulated Protective Order (Doc. 31), Western District Local Patent Rule 2.2, and/or "Appendix A" thereto. *See id*. (addressing standard Protective Order automatically entered in all patent infringement cases).

FRANCIS X. CAIAZZA**, United States Magistrate Judge.**

I. *RECOMMENDATION*

In this patent infringement case, it is respectfully recommended that the District Court construe the disputed claim terms in conformity with the analyses below.

II. *REPORT*

BACKGROUND

On April 1, 2008, the parties appeared before the undersigned for a *Markman* hearing to address claim construction. Pre- and post-hearing briefs have been filed, and the matter is now ripe for adjudication.

The Plaintiff Delta Frangible Ammunition, LLC, is the owner by assignment of U.S. Patent Number 6,074,454, entitled "Lead-Free Frangible Bullets and Process for Making Same." *See generally* Compl. (Doc. 1) at para.para. 1, 4. The Plaintiff at times will be referred to as "Delta" or, for the sake of convenience, "the Patentee." The patent-in-suit will be referred to as "the PIS," "the '454 Patent," or "the Patent."

Delta alleges the Defendant SinterFire, Inc. ("the Defendant" or "SinterFire") is manufacturing and selling products in willful infringement of the PIS. *See* id. at para.para. 5, 7.

The PIS addresses bullets made of at least 60% copper that have "increased frangibility[, *i.e.*,] which can be easily fragmented[.]" *See generally* '454 Patent at "Abstract" & Claim 1. The expected benefits of the invention are the provision of lead-free bullets, given the toxic nature of lead, that "minimiz [e] the risk of both ricochet and back-splatter." *See* id. at "Background" section, col. 1, Ins. 14-26; 27-50. Essentially, the bullets are intended to fracture into small pieces upon hitting a sufficiently hard surface, thereby preventing fragments from striking unintended targets. *See generally* id.

The PIS has two independent claims, Numbers 1 and 39, and multiple dependent claims. *See generally* '454 Patent. Because the dependent claims incorporate by reference the terms in dispute, the court may focus primarily on the independent claims.

Claim 1 covers:

A frangible bullet comprising at least 60 percent by weight copper and manufactured by pressing a copper-containing powder in a die to form a pressed powder compact and subsequently sintering said pressed powder compact, wherein said sintering is partially impeded either[:]

(i) by the addition of a frangibility effecting additive to said powder, or

(ii) through control of density of said pressed powder compact, or

(iii) through control of sintering temperature, or sintering time, or

any combination of the above; so as to produce a bullet capable of fragmenting upon impact with a target.

Id. Claim 39 covers "[a] method of making" such a bullet, and otherwise is materially similar. *See* id.

Before the hearing, the parties reduced their disagreements to the terms "sintering," "sintering temperature," and the phrase "powder is bronze," which appears only in dependent Claim 44. After the hearing, and in reliance on the Defendant's assertion it does not heat bullets to the temperature range required in Claim 44, the Plaintiff has agreed to withdraw its assertion of infringement regarding said Claim. *See* Pl.'s Post-Hearing Br. (Doc. 69) at 1, 17. SinterFire has acquiesced to the withdrawal, *see* Def.'s Post-Hearing Br. (Doc. 71) at 1 n. 1, and the dispute regarding "powder is bronze" is moot. *See* id. In reaching this conclu sion, the District Court should hold the parties judicially bound to their representations, namely that SinterFire does not heat to the temperature range applicable in Claim 44, and Delta therefore has withdrawn its claim of infringement under that Claim.

At the hearing, the parties deliberately conflated the terms "sintering" and "sintering temperature," treating them as presenting the same issues. *See, e.g.,* Corrected Hearing Tr. (Doc. 74, hereafter cited as "Tr.") at 21 (Plaintiff counsel's opening statement, indicating that "[s]intering and sintering temperature[ ] have [the same] common and customary meaning [ ]") and id. at 32 (questioning of Plaintiff's expert, indicating definitions of subject terms were same); *see also, e.g.,* id. at 26 (Defense counsel's opening statement, arguing Plaintiff advanced single, "narrow" interpretation of terms during prosecution history) and id. at 63 (Defendant's *Markman* case-in-chief, in which counsel stated terms "sintering and sintering temperature" had "collapsed [in]to be[ing] the same thing"). The District Court should construe the disputed claim terms accordingly.

The parties' disputes regarding the term "sintering" are informed by the products and processes used by the Defendant. SinterFire has consistently maintained it utilizes a "low temperature technique" that differs from Delta's "high temperature sintering process." *See, e.g.,* Tr. at 23. Indeed, SinterFire is the assignee of a patent, granted shortly after the PIS, which contemplates frangible bullets "heated to a temperature ... below the temperature of joining of the metal particles by sintering ." *See* U.S. Patent No. 6,090,178 (filed under Ex. T to Doc. 58) at "Abstract." FN2

FN2. All of the evidence discussed herein was submitted to the court at the *Markman* hearing, and the parties stipulated to its admissibility. *See* Tr. at 61. The hearing exhibits were not entered into the docket, however, and requiring this would demand an unnecessary expenditure of resources. Accordingly, to the extent possible the court will identify the exhibits by reference to previous and unrelated filings. Should the

undersigned prove unable to identify hearing evidence in the docket, it will append the documents to this Report.

Given this background, the Defendant argues "sintering" means "[the] heating of a pressed powder compact comprised of a copper-containing material *at a temperature ranging from 1400[(deg.)F] to 1900 (deg.)F*." *See* Joint Disputed Claim Construction Chart (Doc. 45) (emphasis added); *see also* Doc. 50 at 10 n. 3 (Defendant's submission, omitting other portions of proposed definition to narrow issues at hearing). In support of its construction, the Defendant relies almost exclusively on the prosecution history, arguing the Patentee has made a clear and unambiguous disavowal of claim scope. *See generally* discussions infra.

Delta argues no such disavowal occurred, and that "sintering" should be given its customary meaning to a person ordinarily skilled in the art. *See generally* id. Because "sintering" is not expressly defined in the PIS, the Plaintiff cites two technical treatises, the sworn statements of the Defendant's expert on invalidity, Dr. Alan Lawley, and Delta's own expert Dr. Randall German. *See* id. Plaintiff's counsel demonstrates that all of these sources give materially similar definitions of the term, and Delta argues they provide insight regarding how a person of ordinary skill in the art would interpret it. *See* id.

ANALYSIS

A. *Claim Construction and the Court's Determination of Meaning to a Person Ordinarily Skilled in the Art.*

The Court of Appeals for the Federal Circuit's decision in *Phillips v. AWH Corporation* provides a blueprint for the court's analyses:

A court construing a patent claim seeks to [afford] a claim the [ordinary and customary] meaning it would have to a person of ordinary skill in the art at the time of the invention....

In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction ... involves little more than the application of the widely accepted meaning of commonly understood words....

In many cases ..., however, determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. Because the meaning ... as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.... Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art....

Within the class of extrinsic evidence, the court has observed that dictionaries and treatises can be useful in claim construction.... We have especially noted the help ... technical dictionaries may provide to a court to better understand the underlying technology and the way in which one of skill in the art might use the claim terms.... Because dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology, those resources have been properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology to those of skill in the art .... Such evidence, we have held, may be considered if the court

deems it helpful in determining the true meaning of [the] language used ....

[Although] ... extrinsic evidence in [a] general [sense is] less reliable than [intrinsic evidence] in determining how to read claim terms, ... encyclopedias and treatises [can be] particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms [so long as they are considered within the context of the intrinsic evidence].

Id., 415 F.3d 1303, 1313, 1314, 1318-19 (Fed.Cir.2005) (citations and internal quotations omitted).

In balancing, (i) the general preference for intrinsic evidence with, (ii) the recognized value of certain extrinsic evidence for the purposes of determining ordinary and customary meaning, the *Phillips* Court opined:

The underlying goal of our decision[s has been] to increase the likelihood that a court will comprehend how a person of ordinary skill in the art would understand the claim terms.... In that process, ... *there is no magic formula or catechism for conducting claim construction. Nor is the court barred from considering any particular sources or required to analyze sources in any specific sequence,* as long as those sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence....

The sequence of steps used by the judge in consulting various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law....

Id. at 1234 (citations omitted, emphasis added).

B. *The Instant Matter*

The undersigned respectfully submits that this is not a case where the meaning of the disputed term(s) is so "readily apparent ... to lay judges" that claim construction "involves little more than the application of the widely accepted meaning of commonly understood words." Rather, the term "sintering" involves concepts that are not obvious to this jurist and layperson.

Resort to the PIS's claims and specification provide little immediate guidance, moreover, for as Plaintiff's counsel suggests the language provides no express definition of "sintering" but rather appears to presume the knowledge and understanding of it by persons of ordinary skill. And though Defense counsel's references to the prosecution history purportedly indicate what falls *outside* the Patent (*i.e.,* heating at temperatures below 1400 (deg.)F and above 1900 (deg.)F), SinterFire provides no evidence regarding what the term "sintering" more generally means.

Under the circumstances, the District Court should invoke its discretion under *Phillips* and begin with the technical writings submitted by the Plaintiff. First is the ASM Handbook, Volume 7 (1998), a "collective effort involving hundreds of technical specialists" regarding materials and metallurgy. *See* excerpts attached under Appendix 1 hereto. This source, which was referenced repeatedly throughout the prosecution history,FN3 states:

FN3. Not all of the prosecution history documents admitted at the hearing are found in the docket, and those that can be are scattered throughout. Accordingly, the undersigned has filed as Appendix 2 hereto a

complete set of the same. The relevant documents are referenced by the Defendant's bench book exhibit number, and have been paginated by the court for easy reference. Thus, the seven-page Office Action Summary mailed on October 14, 1997 (Bench Book Ex. A) i s labeled Ex. "A-1" through Ex. "A-7." Examples of references to the ASM Handbook can be found at Exs. A-4 through A-6, C-4 through C-6, D-4 through D-6, E-5 through E-10, G-7 through G-8, and G-20 through G-21. *See* App. 2 hereto.

[Sintering is t]he bonding of adjacent particles in a powder mass or compact by heating to a temperature below the melting point of the main constituent.
Id.
In addition, the Plaintiff's expert has authored a book on sintering. *See* Randall M. German, *Sintering Theory and Practice* (1996), filed as Ex. E to Doc. 49. The book was written well before Dr. German was in any way involved with the subject matter of this lawsuit, thereby negating concerns of bias as referenced in *Phillips*. *Cf*. id., 415 F.3d at 1318 ("extrinsic evidence consisting of *expert reports and testimony*" "*generated at the time of and for the purpose of litigation*" "can suffer from bias ... not present in intrinsic evidence") (emphasis added). Based on the author's thirty years of experience in powder metallurgy at the time, *cf. generally* Tr. at 29, Dr. German defined sintering as "a thermal treatment for bonding particles into a coherent, predominantly solid structure via mass transport events that often occur on the atomic scale." *Sintering Theory* at 8.

Plaintiff's counsel asserts, and the undersigned agrees, that the definitions above are materially similar and, more significantly, they omit reference to any specific temperature range. *Cf*. Tr. at 8.

Although additional support for this definition is, in the court's view, unnecessary, more can be found in the record. Specifically, Dr. German testified regarding the incompatibility between the assignment of specific temperature range(s) and the science of sintering:

Q. SinterFire has proposed the terms sintering and sintering temperature be limited in the context of this patent to a temperature range of 1400 to 1900-degree[s] Fahrenheit.... Do you believe that it's proper to [so] define those terms ... ?

A. No.... I don't think I've ever seen sintering defined in terms of the temperature before. There are so many different materials, so many different combinations. [It is j]ust contrary to anything that would be the natural definition.

Q. In the context of 60 percent copper ..., would it be proper to limit sintering to the 1400 to 1900 degrees Fahrenheit range ... ?

A. No, because the other 40 percent is wide open, undefined, and really an omnipotent [sic] number of combinations would be possible at that point.

Q. .... Can you please state the various parameters that affect sintering?

A. [The f]irst thing is what powder we're dealing with. Historically, ... we've dealt with particles ... which tend to be a hundred micrometers in size.... [S]ome of the particles might go down to 10 or [20] micrometers but some might go to 200 or even larger.... [S]maller particles will sinter at lower temperatures. Even from a given lot of powder, we can pull out different-sized distributions.

You have higher sintering temperatures or lower sintering temperatures for exactly the same powder, the same composition. So, particle size is part of it.

[Also is t]he degree [to] which we [press] the particles together. In the extreme, we can push the particles together where there [are] no pores. So that's why, in the sintering definition, we talk about a strength change as [a] goal of sintering, not a dimensional change ....

Then we have the heating rate. Sometimes [in] industrial processes, you can become very impatient.... I have seen sintering operations that go 60 hours at the peak temperature, and I've seen others that ... literally go to the [maximum] temperature ... and come back down....

Q. Would it be meaningful to one skilled in the art to define the specific sintering temperature without taking into account these other process variables?

A. No.

Tr. at 33-35.

Dr. German also explained the wide variances in sintering temperature that can result from the use of different constituents:

Q. The patent specifically claims a powder combination of 90 percent copper and 10 percent tin. Can you explain to me at what point sintering begins when this mixture is heated?

A. [Using mixed powders, as opposed to alloys,] the tin is sitting as a distinct chemical ingredient in that composition. At about [440.6 (deg.)F], there is what's called a detect between the copper and tin....

Then, a few degrees higher, the remaining tin ... would melt. That occurs between [440.6 (deg.)F] and [779 (deg.)F] ....

Q. So, has sintering occurred at that temperature?

A. .... [Y]es, from the definition in terms of bond and increase in strength, you would see both of those.... [Y]ou can't revert it back to powder that would be useful to feed into a compacted process again.... Sintering has occurred. It's not a particularly impressive level of sintering for a commercial application like bearings, but I think the intent of this patent was to do something outside the range of traditional powder metallurgy[, *i.e.*, create frangibility].

Id. at 37-39.

Similarly, Dr. German explained how the Patent's use of predominantly copper, as opposed to the iron referenced in the *Slater* prior art (discussed further below), would affect sintering temperature:

Well, the melting temperature is probably [842 (deg.)F] different between copper and iron.... [T]he sintering temperature of copper is much lower than the sintering temperature of iron.

Id. at 44-45.

The Defendants did not present a rebuttal expert regarding claim construction, instead challenging Dr. German's testimony through cross-examination. *See generally* Tr. at 47-58. Counsel was able to demonstrate Dr. German's opinions were not significantly informed by the Patentee's statements during the prosecution history, *see id*. at 57-58, but the court will address that issue separately and without reference to the Plaintiff's expert.

The Defendant also sought to discredit Dr. German's opinions as "academic," rather than reflecting the ordinary skill in the art, and counsel elicited testimony that, on the surface, may appear to support the argument. *See id*. at 51 ("[Q: T]he definitions you gave for sintering, are they made in terms of academic definitions or how that material is used in the '454 [P]atent? [A.] In terms of the academic definition."). Relatedly, counsel seemed to suggest Dr. German was *too* qualified to offer testimony regarding claim construction, objecting the expert was "well beyond a person [ordinarily] skilled in the art" because "[h]is opinions as to what sintering means" were "generated over 40 years as a specialist in the field." *Id*. at 42.

Nevertheless, the court finds Dr. German to have been a credible and convincing expert witness, and he showed no evidence of bias. The court disagrees with the Defendant's premise, moreover, that references to "academia" demonstrate this individual's inability to offer insights regarding the meaning of sintering to a person of ordinary skill. Indeed, the Defendant has secured the testimony of its own expert witness regarding invalidity, Dr. Lawley, who possesses a similar background and experiences. *See* Decl. of A. Lawley (filed as Ex. K to Doc. 63) at para.para. 2-4 (identifying expert's educational background, status as university faculty member, and forty years' experience in research and development of powder metallurgy).FN4

FN4. The Defendant's objection Dr. German is too qualified to testify regarding the ordinary usage of "sintering" is at least somewhat peculiar. The logical implication would be that the court and parties should detensify their analyses to a level of "ordinary skill," and the undersigned cannot imagine how this can or should be done here. In any event, as seen above and below, Dr. German's testimony is consistent with all of the evidence regarding the standard meaning of "sintering," and whether the Patentee disavowed the ordinary definition during prosecution is a separate matter.

As Plaintiff's counsel highlights, Dr. Lawley himself has issued sworn statements agreeing in principle with the definitions of "sintering" referenced above. *See id*. at para. 10 ("[s]intering of materials is a thermal process which increases the strength of a powder mass by bonding adjacent particles together via diffusion or related atomic level mechanisms"). Although Defense counsel suggests Dr. Lawley merely adopted the Patentee's definition to avoid material disputes of fact on summary judgment, *see* Doc. 72 at 4, the expert's declaration neither states nor implies this although it easily could have (*e.g.,* "for the purposes of this Declaration, I have been asked to assume 'sintering' means...."). *See id*.

The sworn statements of both parties' experts are consistent with the technical writings cited by the Plaintiff. And while Dr. German's testimony undoubtedly elucidates the science underlying the definition, neither he nor Dr. Lawley's statements are necessary to conclude sintering means "the bonding of adjacent particles in a powder mass or compact by heating to a temperature below the melting point of the main constituent." FN5 In reaching this conclusion, the court relies primarily, and independently, on the treatises identified above, as confirmed secondarily by the statements of Drs. German and Lawley.

FN5. Given the prosecution history's extensive citation to the ASM Handbook, coupled with that source's lack of bias or even the appearance of bias, its definition is the one the District Court should endorse. *Cf.* discussion *supra* (ASM Handbook reflects "[the] collective effort of hundreds of technical specialists" regarding metallurgy).

The District Court should also conclude the above sources in no way "contradict claim meaning that is unambiguous in light of the intrinsic evidence." *See* discussion *supra*. Turning to the Patent itself, neither independent claim makes reference to specific sintering temperature(s). *See id*. at Cls. 1 & 39. Rather, the only claims citing temperature ranges are dependent Claims 43 and 44, which establish both temperatures and sintering times. *See id*. (method in independent Claim 39 where sintering temperature is 1500 (deg.)F to approximately 1900 (deg.)F, 1600 (deg.)F to 1800 (deg.)F when powder is copper, 1600 (deg.)F and 1700 (deg.)F when powder is brass, and between 1500 (deg.)F and 1600 (deg.)F when powder is bronze). Sintering heat and time are the only factors distinguishing Claims 43 and 44 from independent Claim 39, and the doctrine of claim differentiation prohibits reading the dependent claims' temperature ranges into the independent ones. Acumed LLC v. Stryker Corp., 483 F.3d 800, 806 (Fed.Cir.) (claim differentiation "is clearly applicable when there is a dispute over whether a limitation found in a dependent claim should be read into an independent claim, and that limitation is the only meaningful difference between the two") (citations and internal quotations omitted), *cert. denied,* --- U.S. ----, 128 S.Ct. 615, 169 L.Ed.2d 393 (2007).

Turning to the specification, the "preferred embodiments" section states:

The bullets are ... preferably sintered by heating .... The sintering can be done in a belt furnace which has three zones. The first zone called the 'preheat zone' is set to a temperature sufficient to burn the lubricant off, typically 1000-1200 (deg.)F.

The second zone called the 'high heat' zone is set to the sintering temperature, typically the 1500-1900 (deg.)F range, the exact temperature depending on the material and the frangibility required.

The third zone called the 'cool zone' typically has a water jacket surrounding it which allows the bullets to be cooled to room temperature in a protective atmosphere....

Copper powder pressed to a density between 7.5 to 8.5 g/cm3, preferably about 8.0 g/cm3 and sintered at 1500[(deg.)F] to 1900 (deg.)F, preferably about 1700 (deg.)F, has been found to have excellent firing characteristics and frangibility. Lower density and lower sintering temperature increase the frangibility while higher density and higher sintering temperature increase the ductility. A delicate balance must be struck between frangibility and ductility[, as t]he bullets must have sufficient ductility to withstand the firing operation .... [but] also [must] have sufficient frangibility so that [they] break up into small pieces upon impact against a hard surface.

See id., col. 3, lns. 29-41, 48-60.FN6

FN6. Given the specification's references to 1500 (deg.)F, the District Court may wonder why SinterFire urges a limitation of sintering to the temperature range of *1400* (deg.) F and 1900 (deg.)F. Perhaps in an attempt to show magnanimity, the Defendant has "lowered the range to 1400 (deg.)F" because a publication

of PIS inventor Anil V. Nadkarni "set[s] out 1400 (deg.)F as the lowest conventional sintering temperature for copper materials." *See* Doc. 50 at 15-16. As seen below, the Plaintiff has asserted, and Defense counsel has failed to refute, that the referenced publication addresses *fully* sintered products that are intended to be *non*-frangible (*i.e.,* resistant to breakage). *See* discussion *infra*.

"Preferred" temperature ranges notwithstanding, the Federal Circuit Court has "repeatedly warned against confining claims" to even "very specifical[ly described preferred] embodiments of the invention." Phillips, 415 F.3d at 1323 (citations omitted). "Much of the time, ... it will [be] clear whether the [specification] is setting out specific examples of the invention ..., or whether the patentee instead intends for the claims and the embodiments ... to be strictly coextensive." *Id*. (citation omitted).

A reading of the entire PIS makes abundantly clear the Patentee's descriptions of "preferred" embodiments were just that. Any conceivable doubt as to whether the embodiments and claims were not "strictly coextensive" is put to rest at the close of the specification:

The invention has been described with respect to preferred embodiments. However, as those skilled in the art will recognize, *modifications and variations in the specific details which have been described and illustrated* (*including* blend compositions, *sintering temperatures* and compacting pressures, and bullet manufacturing techniques) *may be resorted to without departing from the spirit and scope of the invention as defined in the appended claims*.

'454 Patent at col. 8, lns. 46-53 (emphasis added).

As just seen, the ASM Handbook's definition of "sintering" is consistent not only with the sworn statements of both parties' experts but the Patent's claims and specification. The only question is whether the Patentee disavowed the plain and ordinary meaning of the term through the prosecution history.

C. *The Prosecution History*

The standards for demonstrating a disavowal of claim scope are a relatively exacting. As recognized in *Phillips,* "the prosecution history represents an ongoing negotiation between the [US]PTO and the applicant, rather than the final product of that negotiation," and it therefore "often lacks the clarity of the specification and thus is less useful for claim construction purposes." Id., 415 F.3d at 1317 (citations omitted). For these and other reasons, the Federal Circuit Court has used words like "clear," "unmistakable," "deliberate[ ]," and "unambiguous" when describing the character and degree of what is required. *See, e.g.,* Purdue Pharma L.P. v. Endo Pharm. Inc., 438 F.3d 1123, 1136 (Fed.Cir.2006); Eolas Techs. Inc. v. Microsoft Corp., 399 F.3d 1325, 1338 (Fed.Cir.2005); Computer Docking Station Corp. v. Dell, Inc., 519 F.3d 1366, 1375 (Fed.Cir.2008) (citations in all omitted). Nothing identified by SinterFire rises to this level.

The District Court should limit its analyses to those portions of the prosecution history submitted by SinterFire. *Cf*. Phillips, 415 F.3d at 1317 (court should consult prosecution history to extent "it is in evidence") (citation omitted). At the *Markman* hearing, Defense counsel began by reviewing the original application for the '454 Patent. *See* Tr. at 65; *see also* Application (attached as Appendix 3 hereto; markings made by Examiner). Unlike the more detailed independent claim ultimately accepted, Claim 1 initially read:

A frangible bullet comprising copper or a copper alloy powder and manufactured by pressing said powder in

a die and subsequently sintering it under conditions so as to produce a bullet capable of fragmenting upon impact with a target.

See id. at pg. 25. The Examiner rejected this and the other independent claim based on the prior art in U.S. Patent Number 5,399,187 (hereafter "*Mravic*").FN7 *See* Tr. at 65; App. 2 at A-2. The Examiner also rejected the dependent claims, including two that specified sintering temperature ranges and durations. *Compare* Application claims 29 & 30 *with* App. 2 at A-4. Among other things, the Office Action stated:

FN7. *Mravic* does not appear in the docket. It is part of the public record, however, and can be found on the USPTO's website at: http:// patft.uspto.gov/netac gi/nph-Parser?Sect1=PTO1 & Sect2=HITOFF & d=PALL & p=1 & u= (R)netahtml(R)PTO(R)srchnum. htm & r=1 & f=G & l=50 & s1=5,399,187.PN. & OS=PN/5,399,187 & RS=PN/5,399,187.

Changes in the method parameters of pressing and sintering pressure, temperature, time [and] atmosphere do not impart patentability unless the recited ranges are critical. Since the determination of these conditions in this case have been to determine the optimum conditions of operation, such determination does not impart patentability and are thus found obvious.
App. 2 at A-4.
In response, the Patentee filed an amendment. *See* App. 2 at C-1 through C-7. The only change to Application claim 1 was the requirement that the bullet be "*predominantly* copper," an amendment specifically recommended by the Examiner. *Compare* App. 2 at C-2 (emphasis added) *with* Application at 25 (handwritten markings of Examiner, inserting word "predominantly" before "copper") *and* Tr. at 64 (Defense counsel's comment, "[t]he markings ... were done by the Examiner during the examination of the patent application").

The Defendant highlights a portion of the Patentee's response addressing original dependent claims 21-24 and 49-52. Notably, these claims were not the ones identifying specific temperature ranges, but rather identified specific powder mixtures. *See* id. In distinguishing *Mravic* and excerpts of the ASM Handbook, the Patentee stated among other things:

While *Mravic* ... does not show alloyed copper, the ASM Handbook is cited as indicating that the copper/tin/zinc powder may be premixed before use, to ensure homogeneity of the mixture.... [N]either *Mravic* ... [n]or the ASM Handbook recognize[s] that with the additives of the present invention, or the small changes in sintering temperatures (Table 6) set forth in the present application, a wide range of frangibility can be achieved with bronze and brass alloys. Hence[, the Patentee] maintain[s] claims 21-24 and 49-52 claiming a powder and a frangible bullet made through compressing a predominantly prealloyed brass (or bronze) powder of 5-40% zinc (or 2-20% tin) are not obvious from, and are indeed patentable over, *Mravic* ... in view of the ASM Handbook.

App. 2 at C-5.FN8

FN8. The Defendant describes *Mravic* as "teach[ing] a lead-free bullet, [where] copper can be one of the constituents in that bullet ." Tr. at 65. The parties are in agreement that the Patentee distinguished *Mravic* based on the low level of copper contained therein. *See* id. at 65 (Patentee argued "*Mravic* had a required density for the frangible bullet, and you could not get to that density unless the .... powder" was "predominantly ... a heavier metal than copper"); Tr. at 100 (stating Plaintiff's position regarding *Mravic:*

"Copper is only a constituent in that bullet in 15 to 28 percent. The main components are high density metals such as tungsten and iron ....").

The Defendant places great weight on the Patentee's reference to the Patent's "Table 6," which lists "[b]ullet [p]rocessing and [t]est [r]esults" for certain blends, mold pressures, and sintering temperatures ranging between 1500 (deg.)F and 1700 (deg.)F. Counsel takes the position that, in citing Table 6, the Patentee represented that the temperatures referenced therein were "critical." *See* Tr. at 67.

The undersigned disagrees. Reading the response in context, it is quite reasonable to conclude the Patentee referenced Table 6 as an *example* of how "small changes in sintering temperatures" could achieve "a wide range of frangibility." *See* discussion *supra*. Importantly, the cited portion of the response addressed dependent claims reciting specific constituent blends, not sintering temperature. Nothing in this portion of the prosecution history can be read as a clear and unambiguous disavowal of any specific temperature range, irrespective of the powder constituency.

In the next Office Action, the Examiner rejected revised claim 1, stating the addition of the word "predominantly" before "copper" did not "clear the claims of the prior art. The term 'predominantly' is relative and [im]precise to meaning [,] *i.e.* [,] predominant to what-impurities, additives, [*et cetera*]." App. 2 at D-2. The Examiner again rejected the original dependent claims containing temperature ranges, reiterating that "[c]hanges in the method parameters of pressing and sintering pressure, temperature, time [and] atmosphere do not impart patentability unless the recited ranges are critical." Id. at D-4.

Before the Patentee could respond, the Examiner sent out another Office Action, *see* App. 2 at E-1 through E-11, indicating claim 1 was anticipated by British Patent Application No. 2278423 (hereafter "*Slater*"). *See* Ex. I to Doc. 58. Otherwise, the Examiner rejected the dependent claims that recited temperature ranges based on the same lack of criticality referenced above. Id . at E-4 through E-5.FN9

FN9. Although Defense counsel stated at the hearing that the Examiner's "criticality" analysis now extended to the *Slater* prior art, there is nothing in the patent history to support this assertion. *Compare* Tr. at 70 (as to criticality, "[n]ow [the examiner is] rejecting the claims on *Slater*") *with* App. 2 at E-4 through E-5 (rejecting relevant claims over *Mravic*).

In response, the Patentee amended claim 1 by removing the term "predominantly" and replacing it with "at least 60 percent by weight copper." *See* App. 2 at G-3. As it had done previously, the Patentee distinguished *Mravic* based on said invention's use of predominantly high-density metal powders as opposed to copper. *See* id. at G-12 through G-14 ("*Mravic* is concerned with a sintered composite bullet having as its major constituent a high-density metal powder"). Regarding *Slater,* the Patentee stated:

Slater discloses sintering at temperatures in the range of [1202-1382 (deg.)F] and that higher temperatures produce ***non***-frangible bullets.... *Slater* also discloses sintering times of about 1 to 5 hours. Further, *Slater* does not teach any amount of copper or bronze, or additives, to be used in the bullet and teaches only that the density of the bullet should be at minimum about 6 gm/cm ^{3}.

Applicants have found that to produce a frangible, predominantly copper bullet, the sintering temperature preferably is between about 1500[(deg.)F] and 1900 (deg.)F ... and that the sintering time preferably is

between about 10 to 120 minutes, more preferably between about 15 and 45 minutes.

Further, Applicants have found that the frangible bullet preferably comprises at least 60% copper.

The sintering temperature, sintering time, composition and density of the bullet all [a]ffect the balance between dimensional tolerances, frangibility, ductility, cost, ricochet and target backstop damage that Applicant's invention achieves. Slater' s silence on these factors leaves one skilled in the art without an instructional clue as to how a frangible predominantly copper bullet might successfully be made. *Slater*' s passing reference to copper and bronze powders is merely an idea that, at best, one is invited to try.

App. 2 at G-10 through G-11 (emphasis added).

Defense counsel reads the above passages as distinguishing *Slater* on the basis it teaches too low a temperature (*i.e.*, 1202-1382 (deg.)F). Tr. at 73. Under the Defendant's theory, the Patentee implicitly represented that *any* sintering below 1382 (deg.)F was clearly and unambiguously disavowed.

The undersigned begs to differ. A finding of clear and unmistakable disavowal would require the court to essentially ignore the Patentee's indication that sintering temperature was but one of a host of factors affecting frangibility for the purposes of the '454 Patent. *See* discussion *supra*. "[T]he prosecution history must always receive consideration in context," *see* Computer Docking Station, 519 F.3d at 1378, and the District Court should reject SinterFire's attempts to cherry-pick only those passages supporting its arguments.

This conclusion is bolstered by a review of what was actually claimed in *Slater*. The only temperature range referenced in the prior art relates to a bullet whose metal core is "a coarse iron powder." *See* Ex. I to Doc. 58 at 6, claims 1, 6, 7 & 8 (contemplating sintering temperature of between 1112-1472 (deg.)F for bullets with metal core made of "a coarse iron powder"). As explained time and again by the Plaintiff, its invention was directed to a bullet made predominantly of copper, and the Defendant's prosecution analysis compares "apples" to "oranges." *See, e.g.*, Tr. at 99-100; *cf. generally* discussion *supra* (quoting Dr. German's testimony regarding differences in sintering temperatures between iron and copper).

Finally, the Defendant's position fails to account for the multitude of varying features identified by the Patentee in distinguishing *Slater*. In addition to sintering temperature, sintering time, composition, and density, the Patentee also noted the prior art's failure to specify the percentage copper, as well as the art's demand for a plastic or metal adherent coating. *See* App. 2 at G-10 through G-12. Although "a disavowal, if clear and unambiguous, can lie in a single distinction among many," the inventor's references to "a multitude of distinctions may serve to make any single distinction in the group less clear and unmistakable as the point of distinction over prior art and as a critical defining point for the invention as a whole." Computer Docking Station, 519 F.3d at 1377-1378 (citations omitted). There is no basis for concluding the Patentee unmistakably limited its claims to a temperature range higher than *Slater*' s, and the Defendant's argument is unconvincing.

The Examiner next rejected the independent claims, and the dependent claims citing temperature ranges, based on British Patent Number 531,389 (hereafter "*Woodworth*"). *See* Ex. J to Doc. 58; *see also generally* App. 2 at H-2, H-3, H-5. The parties have not made the portion of the Office Action addressing independent claim 1 part of the record. Nevertheless, the court may reasonably deduce that the Examiner rejected the claim over *Woodworth* (despite that ar t's being directed to a *non*-frangible bullet) because its "use of the

same materials and approximate processing parameters would produce a bullet with similar characteristics." *See* id. at H-3.

In rejecting the temperature-related dependent claims, the Examiner stated:

[Regardless of the fact that *Woodworth* contemplates a non-frangible bullet, it] discloses the invention substantially as claimed [in the PIS]. However, *Woodworth* does not disclose the range of pressing and sintering parameters except for a temperature range of 1500-1550[(deg.)]F for certain compositions.

Applicant has claimed various process conditions based upon the material selected. However, changes in process conditions of an old process do not impart patentability unless the recited ranges are critical.... In this case, the selection [of] process parameters would be within ordinary skill in the art at the time of the invention in order to form a fully dense alloyed bullet.

App. 2 at H-5.

In response, the Patentee significantly amended the language of the independent claims to discuss the "partial imped[iment]" of sintering through the use of additives, the density of the pressed powder compact, and/or through control of sintering temperature or time. *See* App. 2 at J-2 through J-3. Although Defense counsel focuses on page J-15, the Patentee's distinction of *Woodworth* should be read in full context:

Woodworth neither discloses nor suggests a frangible bullet. *Woodworth* is directed to bullets formed by sintering processes previously used to manufacture [products that] .... will resist great crushing, pressures, and fracturing strains and which [are] of great strength ....

The prior processes are further described as providing a bullet [that] can be caused to absorb lubricant which during firing ... reduce[s] wear [on the gun barrel] ....

Thus, to one skilled in the art, *Woodworth* discloses and teaches a bullet of high strength and crush resistance which may be impregnated with a lubricant to resist barrel wear. Nowhere does [it] disclose or suggest that [the] described bullet is frangible.

In fact, the result of following the teachings of *Woodworth* is NOT a frangible bullet. As set forth in the accompanying Declaration of [one of the PIS inventors] Anil V. Nadkarni ..., when bullets are manufactured in conformance with the teachings of *Woodworth,* the bullet is *not* frangible.... This is the result expected by one skilled in the art.

[I]n addition to not disclosing any frangible bullet, [*Woodworth*] does not disclose or suggest a frangible bullet manufactured by partially impeding sintering. It particularly does not disclose [sintering] that is partially impeded either (i) by the addition of a frangibility effecting additive to said powder, or (ii) through control of density of the pressed powder compact, or (iii) through control of sintering temperature or sintering time, or any combination thereof, so as to produce a bullet capable of fragmenting upon impact with a target.

App. 2 at J-13 through J-15 (internal quotations omitted, emphasis and text capitalization in original).

Defense counsel takes these passages as reflecting a clear and unambiguous representation that *Woodworth*

sinters at too high a temperature:

[T]he claims [we]re rejected by *Woodworth*. It sinters at higher temperatures, and again, the [P]atentee said, no, that is not our invention. It's too high. [A]nd [then] the patent was ... allowed. Clearly, the patentee has now convinced the [E]xaminer that the sintering temperature ... parameters ... are significant, even though they are not in Claim 1. There is no temperature [limitation] in Claim 1.

Tr. at 75-76.

To follow this train of reasoning, the Defendant relies on the declaration of Mr. Nadkarni dated January 25, 1999. *See* Ex. H to Doc. 63. In relevant part Mr. Nadkarni stated that, "[t]o confirm ... *Woodworth* does not teach a frangible [product]," he had bullets manufactured in "strict adherence to [its] teachings," including the use of specific powder constituents, pressed to specified densities, at a sintering temperature of 1525 (deg.) F for 20 minutes. *See* id. at para. 7, pgs. 7-8. The results were non-frangible bullets. Id.

The inventor went on to say:

At the sintering conditions described by *Woodworth,* complete sintering occurs. In contrast, the present application teaches sintering under conditions that partially impede the sintering process. For example, the instant application discloses a frangible bullet composed entirely of copper powder....

In this embodiment, sintering is at a temperature between about 1500 (deg.)F and 1900 (deg.)F. Since copper melts at 1983 (deg.)F, no melting or liquid-phase sintering occurs. Rather, the particles of copper are bonded together by a mechanism known as solid-state diffusion....

By controlling the temperature and time of sintering in the range described in this application, the sintering is partially impeded....

Id. at pg. 9.

Mr. Nadkarni went on to reveal how the use of different composite materials radically affects the sintering temperatures required. For a mixture of 90 parts copper, 10 parts tin, and 0.75 parts molding lubricant, bullets sintered at 500 (deg.)F and 700 (deg.)F were frangible, and those sintered at 1200 (deg.)F were not. Id. at pg. 11.

In closing, the inventor stated:

[A] number of individual metal and alloy powders, and mixtures thereof[,] may be compacted and sintered into bullets. However, in order to make a frangible bullet, the sintering must be carried out under conditions that partially impede the sintering process as taught in the present application.

Woodworth does not disclose a frangible bullet, but merely teaches that a known process for making strong and ductile porous bronze bearings can be used also to make strong and ductile porous bronze bullets.

Id. at para. 8, pg. 11.

Although Mr. Nadkarni's declaration discussed one embodiment (pure copper) utilizing a sintering

temperature between 1500 (deg.)F and 1900 (deg.)F, nowhere did it state or imply his invention was restricted to that temperature range. Quite to the contrary, he specifically discussed another embodiment that effectuated sintering in the 500 (deg.)F and 700 (deg.)F range. Placing aside the Defendant's assertion Mr. Nadkarni essentially "stole" the lower-temperature sintering concept from SinterFire's inventor, *see* discussion infra, the declaration's statements do more to undermine the Defendant's position than support it.

In conclusion, the Defendant has failed to show the Patentee deliberately and unmistakably disavowed claim scope outside the sintering temperature range of 1400 (deg.)F and 1900 (deg.)F.FN10

FN10. Somewhat relatedly, Defense counsel has failed to demonstrate the Patentee overcame *Woodworth* by representing the prior art sintered at a higher temperature. *See* discussion *supra* in text. The only referenced temperatures in *Woodworth* appear in the specification, and the range cited is 1500 (deg.)F and 1550 (deg.)F. *See* Woodworth Patent at 1st column of pg. 3, lns. 35-38. The sole and consistent point made during the prosecution history was that, should one skilled in the art utilize the parameters identified in *Woodworth,* the result would be complete sintering and a non-frangible bullet. *See* discussions *supra* in text.

Although the discussions above are sufficient to demonstrate why SinterFire has failed to show a clear and unambiguous disavowal of claim scope, the undersigned pauses to address a more general theory presented by the Defendant less captured in the prosecution minutiae. That is the purported "criticality" of sintering temperature (along with pressing parameters, sintering pressure, sintering time, and atmosphere). *See* Office Actions cited *supra*.

Defense counsel's theory is as follows. The Examiner's Office Actions repeatedly advised that, in order for the Application claims to be patentable, temperature ranges had to be "critical." Through its distinction of prior art, the Patentee demonstrated temperature ranges in the prior art were higher or lower, and as a result the Examiner finally was satisfied that the 1500 (deg.)F to 1900 (deg.)F range was critical. *See, e.g.,* Tr. at 27, 66-67, 73, 95-96.

As recognized by Plaintiff's counsel, SinterFire's theory overlooks the fact that specific temperature ranges appeared only in dependent claims, never the independent ones. Not once was an independent claim rejected because temperature ranges were not critical; this would have been impossible because the independent claims did not contain temperature ranges. Simply put, the criticality analysis was never directed toward the independent claims, and it has no impact on the eventual acceptance of the Patent.FN11

FN11. The district court should reject the Defendant's assertion the criticality analysis extends to all claims because it has alleged "argument-based estoppel." *See* Doc. 72 at 5. "Any argument-based estoppel affecting a limitation in one claim will also extend to all claims *in which that limitation appears*." Allen Eng'g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1350 (Fed.Cir.2002) (citation omitted, emphasis added). Here, the temperature ranges in the dependent claims never appeared in the independent claims.

To the contrary, the prosecution history strongly suggests that the Patentee's clarification of the independent claims to include the "partial imped[iment]" of sintering through the use of additives, density of powder compact, an/or control of sintering temperature/time is what was required to establish patentability. And though the Examiner also accepted the dependent claims referencing temperature ranges (numbered 43 and 44 in the PIS), there is no basis for concluding any allowance(s) resulted from a clear and unambiguous

disavowal of claim scope. Nor is there reason to read the final dependent claims' limitations into the independent ones. *See* discussion *supra* regarding doctrine of claim differentiation.

Were the court to try and place itself in the mind of the Examiner and divine why he withdrew his "criticality" objection, a more reasoned prediction would be that the clarification of "partially impeded" sintering in the independent claims provided sufficient context for (or made moot) the criticality issue raised in connection with the dependent claims. Such an exercise is bound to speculation, however, and it adds little to the discussion of whether a clear and unambiguous disavowal occurred. *Cf.* Phillips, 415 F.3d at 1317 (because "the prosecution history represents an ongoing negotiation," rather than final product thereof, it "often lacks ... clarity" and "is less useful for claim construction"). The Defendant falls well short of its burdens, and the prosecution history does not modify the ordinary and customary meaning of "sintering," as defined above.

Another angle pursued by the Defendant relates to the evidence that Mr. Nadkarni, through one of his co-inventors, obtained samples of SinterFire's lower-temperature bullets and tested them. *See generally* Tr. at 81-86. This occurred in the summer of 1998, well after the application for the '454 Patent was filed but before Mr. Nadkarni submitted his January 25, 1999 declaration. *See generally* id. The Defendant's implication, it seems, is that the Patentee previously was unaware of low temperature sintering, it "stole" the idea from SinterFire's inventor, and then utilized the knowledge to secure approval of the Patent.

At the onset, the court must note that this theory makes little sense. The knowledge the Patentee purportedly misappropriated and passed on to the Examiner addressed sintering at temperatures *well below the range SinterFire now seeks to have read into the sintering definition*. *Compare* Nadkarni Decl. quoted above (discussing sintering of frangible bullets at temperatures between 500 (deg.)F and 700 (deg.)F) *with* discussions *supra* (reciting Defendant's argument that Patentee disavowed claim scope for sintering below 1400 (deg.)F and above 1900 (deg.)F); *see also* discussion *supra* (court's observation Dr. Nadkarni's declaration did more to undermine SinterFire's position than support it).

If anything, the Defendant's suggestions of misappropriation would appear more a call for relief under the equities. Counsel has failed to identify legal authority, however, demonstrating this is a proper consideration for the purposes of claim construction. At best, Sinterfire's belief the Patentee "stole" its low temperature sintering concept conceivably could support a cause of action for misappropriation; it has no place in the claim construction analyses here.FN12

FN12. The District Court should state no opinion regarding whether SinterFire has asserted, or can prove, the elements of any state law claim. *Compare* Def.'s evidence Patentee obtained samples of Defendant's bullets (noting SinterFire's inventor "gave away samples" at symposium) *with, e.g.,* Parsons v. PHEAA, 910 A.2d 177, 183 (Pa.Commw.2006) (under Pennsylvania law, misappropriation of trade secrets requires that relevant materials were "the subject of efforts ... reasonable under the circumstances to maintain ... secrecy") (citation and internal quotations omitted), *appeal denied,* 591 Pa. 686, 917 A.2d 316 (Pa.2007).

Finally, the Defendant's misappropriation theory ignores the essential fact that the Patent's claims, as stated in both the original application and as finally approved, included limitations covering the same copper/tin mix used in obtaining the lower-range sintering temperatures. *Compare* Nadkarni Decl. (addressing sintering of "90 parts copper, 10 parts tin, and 0.75 parts molding lubricant" at 500 (deg.)F to 700 (deg.)F) *with* original claim 24 (mixture of copper powder with "2 to 20 percent by weight ... tin powder"); final Claim 13

(same); final Claim 15 (dependent claim stating "the powder is a mixture of about 90 percent by weight copper and about 10 percent by weight tin").

The Defendant's misappropriation theory is unavailing. So too are its arguments regarding "conventional sintering," as that phrase appeared in the Plaintiff's "continuation in part" of the '454 Patent, filed under U.S. Patent Number 6,536,352. *See* Ex. C to Doc. 50 (hereafter "the '352 Patent" or "'352").

Counsel highlights a portion of the '352 Patent stating: [In this invention, a] pressed compact of the admixture of metal powders is formed into the shape of a bullet ... as desired, and the pressed compact then is heated under conditions effective to reach the melting point of the lower melting point binder metal to place the lower melting point binder metal into a molten state, or at least a partial molten state, thereby effectively 'wetting' the surface of the higher melting point matrix metal powder. The process is effective to bond the compacted powders together with minimal alloying taking place.

....

An advantage of this invention is that the above described 'wetting' bonding process and 'diffusion' bonding process of manufacturing *versus conventional sintering* enables the production of compacted bullets with extremely small dimensional changes occurring between the pressed compact and the final product.

'352 Patent at col. 3, lns. 12-21, 50-59 (emphasis added); *see also* Tr. at 77 (Defense counsel, quoting same).

Defense counsel suggests that, in referencing "conventional sintering," the Patentee distinguished the lower-temperature process from the "conventional" high-temperature sintering in Patent '454. *See generally* Tr. at 76-77. SinterFire has challenged the validity of the '352 Patent, moreover, and counsel argues the USPTO rejected the Patentee's assertion the low-temperature sintering in '352 was already disclosed in the '454 Patent. Id. at 78-79.

As to the '352 Patent's use of the words "conventional sintering," the Plaintiff has introduced evidence that the inventors used this phrase to distinguish its processes from conventional operations that utilize *full* (as opposed to partial) sintering to create *non*-frangible products. *See* Tr. at 16-18. This is consistent with the understanding, demonstrated time and again in the prosecution history, that Delta does not engage in "conventional" sintering, but rather uses partially impeded sintering. *See* discussions *supra*. In any event, the single phrase in the '352 Patent identified by the Defendant is far too ambiguous to create an clear and unmistakable disavowal.

Turning to the '352 Patent's prosecution history, the undersigned cannot agree the USPTO rejected arguments that the temperature ranges in the continuation-in-part were disclosed in the PIS. Rather, the examiner found a distinction between the partially sintered bullets in the '454 Patent and the purportedly *non*-sintered bullets in '352:

It is immaterial whether or not the heating temperature range disclosed in the '454 [P]atent will inherently melt and wet the copper matrix powder. The determining factor is whether the '352 [P]atent claims subject matter which was not disclosed in the '454 [P]atent.

It does.... [T]he '352 [P]atent recite[s] a frangible bullet ... made by a wetting process ... and which has not been sintered. The '454 [P]atent does not teach a frangible bullet ... which has not been sintered. The

concept of a non-sintered frangible bullet ... was first introduced in the ... application [that] became the '352[P]atent.

See '352 Patent's prosecution history (attached as Appendix 4 hereto) at 12 (internal quotations omitted).

As just seen, the '352 examiner's comparison of the "wetting" process, versus partially impeded sintering, is what led him to believe the continuation-in-part was invalid. Precise heating ranges were, by his own words, "immaterial." There has been no clear and unambiguous disavowal.FN13

FN13. The District Court need not, and should not, concern itself with the validity or invalidity of the Plaintiff's '352 Patent. It suffices to say that nothing in its prosecution history, as provided by the Defendant, demonstrates sintering in the PIS was limited to 1400 (deg.)F to 1900 (deg.)F.

Last are some "loose ends" raised by SinterFire, namely the excerpted deposition testimony of Mr. Nadkarni FN14 and his publication, "Copper Powder Metallurgy Alloys and Composites" (1998). *See* Ex. K to Doc. 58.

FN14. Pages 114-15 of Mr. Nadkarni's deposition do not appear in the docket. Given that the undersigned will quote the relevant passages verbatim, there is no need to append those pages to this Report.

Defense counsel cites the following deposition testimony:

Q. Is there an actual disclosure in the [']454 [P]atent of using temperatures in the range of 500[(deg.)]F to 1200[(deg.)]F in connection with mixed powders of copper and tin?

A. No.

See Tr. at 89 (quoting Dep. Tr.).

If the Defendant believes this passage reveals a clear and unambiguous disavowal of sintering temperatures below 1400 (deg.)F, it reads far too much into Mr. Nadkarni's testimony. Given his prior sworn statements the PIS covers sintering in the 500 (deg.)F to 700 (deg.)F range, the inventor's testimony can be interpreted consistently as acknowledging that the exact temperatures of 500 (deg.)F and 1200 (deg.)F do not appear in the Patent specification. Mr. Nadkarni is not a lawyer, and to deduce that he admitted a legal conclusion regarding what was "disclosed" in the Patent proves to much. *Cf.* Tr. at 98 (Plaintiff counsel's argument inventor merely "acknowledge[d] that there are no specific examples [recited] in the '454 patent of using temperatures in the range of 500 to 1200 degrees Fahrenheit"). Again, there is no evidence of a clear and unambiguous disavowal.

As for the inventor's 1998 publication, Plaintiff's counsel has argued, and the Defendant has failed to refute, that the article was directed at conventional, fully sintered products designed not to break. *See* Tr. at 17-18 ("When one reads this article, it[is] plainly directed to the manufacture of non-frangible products. The products ... discussed [in connection with] copper are electrical components. In the discussion of [bronze], they are bearings. These are non-breakable parts."). The District Court should read the article consistently, and it offers no guidance in defining the term "sintering."

CONCLUSION

For all of the reasons stated above, the District Court should define the terms "sintering" and "sintering temperature" as "the bonding of adjacent particles in a powder mass or compact by heating to a temperature below the melting point of the main constituent."

In accordance with the Magistrate's Act, 28 U.S.C. s. 636(b)(1) (B) and (C), and Rule 72.1.4(B) of the Local Rules for Magistrates, objections to this Report and Recommendation are due by August 8, 2008.

Responses to objections are due by August 18, 2008.

W.D.Pa.,2008.
Delta Frangible Ammunition, LLC v. Sinterfire, Inc.

Produced by Sans Paper, LLC.