United States District Court,
D. Delaware.

BAYER AG, a corporation,
Plaintiff.
v.
SONY ELECTRONICS, INC., a corporation,
Defendant.
Bayer AG, a corporation,
Plaintiff.
v.
Sony Corporation, Inc., a corporation, and Dowa Mining Co., a corporation,
Defendants.

Nos. CIV.A.95-8-JJF, CIV.A.97-401-JJF

Nov. 4, 2002.

Suit was brought alleging infringement of patent describing and claiming a magnetic metal powder suitable for use in magnetic recording media such as in audio and video tapes. Defendants counterclaimed that the patent was invalid and unenforceable. The District Court, Farnan, J., held that: (1) patentee failed to establish that defendant literally infringed patent; (2) patent was not invalid as anticipated by prior art; (3) patent was not obvious; (4) patent was invalid due to lack of enablement; (5) patentee did not engage in inequitable conduct before Patent and Trademark Office (PTO); (6) patent infringement suit was not barred by laches; and (7) patentee's pursuit of patent infringement litigation did not amount to an abuse of process.

Patent adjudged invalid and not infringed.

4,290,799. Invalid And Not Infringed.

Rudolf E. Hutz, Esquire, R. Eric Hutz, Esquire, Helena C. Rychlicki, Esquire, Daniel C. Mulveny, Esquire of Connolly Bove Lodge & Hutz, LLP, Wilmington, DE, for Plaintiff.

Douglas E. Whitney, Esquire, Thomas C. Grimm, Esquire, Mary B. Graham, Esquire, Rodger D. Smith, Esquire of Morris, Nichols, Arsht & Tunnell, Wilmington, DE, for Defendants.

MEMORANDUM OPINION

FARNAN**, District Judge.**

This action was brought by Plaintiff, Bayer AG ("Bayer"), against Defendants, Sony Electronics Inc. ("SEL"), Sony Corporation, Inc. ("Sony") and Dowa Mining Co. ("Dowa") (collectively "the Sony

Defendants"), for infringement of U.S. Patent No. 4,290,799 (the " '799 Patent"). The '799 Patent issued to Bayer on September 22, 1981 and expired on February 25, 2000. The '799 Patent describes and claims a magnetic metal powder suitable for use in magnetic recording media such as in audio and video tapes. Bayer contends that SEL infringed the '799 Patent by making, using or selling magnetic record tapes containing the metal powders claimed in the '799 Patent. In addition, Bayer contends that Sony and Dowa actively induced direct infringement in the United States through their activities and relationship with each other and with SEL.

The Sony Defendants have denied Bayer's allegations of infringement and have counterclaimed for a declaratory judgment of non-infringement. In addition, the Sony Defendants have counterclaimed that the '799 Patent is invalid and unenforceable. Specifically, the Sony Defendants allege that the '799 Patent is invalid on the grounds of anticipation, obviousness, enablement, lack of written description and indefiniteness and unenforceable due to inequitable conduct by Bayer before the United States Patent and Trademark Office ("PTO").

The Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. s.s. 1331 and 1338, because this action arises under the patent laws of the United States. In addition, the Court has subject matter jurisdiction over the Sony Defendants' counterclaim action pursuant to 28 U.S.C. s.s. 1338, 2201, and 2202, because the Sony Defendants seek declaratory judgment with regard to claims arising under the patent laws of the United States. Personal jurisdiction over the parties exists pursuant to 10 Del. C. s. 3104, the Delaware long-arm statute. Likewise, venue in this district is appropriate under 28 U.S.C. s.s. 1391 and 1400. Neither jurisdiction nor venue is contested by the parties.

The Court conducted a nine day bench trial on the issues presented by the parties. This Memorandum Opinion constitutes the Court's findings of fact and conclusions of law on the claims and counterclaims presented by Bayer and the Sony Defendants.

BACKGROUND

I. The Parties

Bayer is a German corporation having a principal place of business in Leverkusen, Germany. Bayer operates approximately 350 companies world-wide and is principally involved in the health care and chemicals industries. (DX 671).

Defendants Sony and Dowa are Japanese corporations with principal places of business in Tokyo, Japan. (DX 672, 673). In addition to other businesses not related to this action, Dowa is involved in the manufacture of high quality metal powders used in the manufacturing of magnetic recording tapes. Defendant Sony is involved in audio and video electronics, information technology, music, and motion picture and television production and distribution. Defendant Sony purchases magnetic metal powders from Dowa for use in manufacturing magnetic recording tapes.

Defendant SEL is a Delaware corporation with a principal place of business in Park Ride, New Jersey. (D.I.412, Ex. 1, para. A). SEL is a wholly owned subsidiary of Sony. SEL sells metal tape products that are purchased from Sony and magnetic recording tapes that are manufactured using Dowa metal powders at its facility in Dothan, Alabama.

II. The '799 Patent And The Technology Generally

The '799 Patent claims a metal powder suitable for magnetic recording which consists essentially of iron. ('799 Patent, Abstract & col. 1, 11. 5-7). The individual particles of the powder are acicular and contain for purposes of Claim 1 an average of no more than 5 pores and no more than 2 metal cores and for purposes of Claim 2 an average of no more than 1 pore and 1 metal core. The particles are produced by precipitating and oxidizing an aqueous iron-salt solution to produce finely divided acicular iron-oxide-hydroxide. The particles are stabilized by treatment with a variety of metals and compounds like cadmium, lead, calcium, magnesium, zinc, aluminum, chromium, tungsten, a phosphorous oxide and/or a boron oxide, and converted into ferromagnetic iron oxide of low pore content. The iron oxide is then reduced to a metallic iron with a gaseous reducing agent at about 300 (deg.) to 600 (deg.) C. ('799 Patent, Abstract).

The magnetic powder is used to make magnetic recording tapes. The purpose of magnetic powder for recording purposes is to achieve higher storage densities. Magnetic recording tapes consist of an underlying base film and a coating containing the magnetic particles. (O'Grady Tr. 660-664). The coating is produced from a mixture containing magnetic particles and other ingredients and is filtered to eliminate agglomerates that might occur because of the magnetic attraction of individual particles. (O'Grady Tr. 660-664). A coating machine applies a uniform layer of the coating to the base film. Before the coating is dried, a powerful magnetic field orients the particles so that each particle is as parallel to the direction of the magnetic tape as possible. The coated film is then dried and the surface is smoothed through a process called calendering. (O'Grady Tr. 660-664, 515). During the calendering process, the tape is pressed between heated, polished rollers to produce a smooth tape surface. The tape is then cured, and cut into strips to be wound into reels or cassettes.

Among the important properties of magnetic tape are its remanence, coercivity and squareness ratio. (DX 280 at 000101-02). Remanence is the magnetization remaining on the tape following the effects of a magnetic field, which determines the strength of a recording. (DX 280 at 000101-02). Coercivity is a measure of the tape's resistance to demagnetization or its "magnetic hardness." (DX 280 at 000101-02). The squareness ratio compares the strength of the recording (remanence) with the amounts of magnetization required to make the recording. (DX 280 at 000101-02).

Among the important qualities for the magnetic particles used in the coating for magnetic tapes are a high coercivity to resist being demagnetized, chemical stability to prevent rusting and the concomitant loss of information, and dispersability so that they can be uniformly coated on the tape. (O'Grady Tr. 658-661, 754). Different types of magnetic particles have been used over the years in the manufacture of magnetic tapes. Gamma iron oxide particles were used in 1937 and continue to be used today. However, as technology progressed, particles with a higher magnetization than the traditional iron oxides was needed. (DX 619 at 12-14). Companies like Defendant Sony experimented with metal tape formulations and the use of particles that were an alloy of three metals, iron, cobalt and nickel. (DX 481 at S2828). Some manufactures worked with chromium dioxide particles and others with cobalt epitaxial doped iron oxide particles. The cobalt epitaxial doped iron oxide particles predominated in the industry and are still used today in home VCR applications, because they can be produced at a lower cost than the chromium dioxide particles. (DX 619 at 12-14).

The newer generation of magnetic recording technology focuses on metal particle coatings. (DX 619 at 12-14). The efforts of several companies were aimed at producing metal particle coatings for tape applications in hand-held video cameras and professional video and audio use. A need also developed for higher densities for data storage applications, like backing up computer systems. Bayer and the Sony Defendants

were among the corporations engaging in extensive research regarding these metal particles.

DISCUSSION

I. Claim Construction

A. *The Legal Principles of Claim Construction*

[1] Claim construction is a question of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 977-78 (Fed.Cir.1995), *aff'd,* 517 U.S. 370, 388-90, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). When construing the claims of a patent, a court considers the literal language of the claim, the patent specification and the prosecution history. Markman, 52 F.3d at 979. A court may consider extrinsic evidence, including expert and inventor testimony, dictionaries, and learned treatises, in order to assist it in construing the true meaning of the language used in the patent. Id. at 979-80 (citations omitted). A court should interpret the language in a claim by applying the ordinary and accustomed meaning of the words in the claim. Envirotech Corp. v. Al George, Inc., 730 F.2d 753, 759 (Fed.Cir.1984). However, if the patent inventor clearly supplies a different meaning, the claim should be interpreted accordingly. Markman, 52 F.3d at 980 (noting that patentee is free to be his own lexicographer, but emphasizing that any special definitions given to words must be clearly set forth in patent). If possible, claims should be construed to uphold validity. In re Yamamoto, 740 F.2d 1569, 1571 & n. * (Fed.Cir.1984) (citations omitted).

B. *The Meaning Of The Disputed Terms of* the '799 Patent

Bayer asserts Claims 1-3 of the '799 Patent against the Sony Defendants. Claims 1-3 of the '799 Patent read as follows:

1. A metal **powder**, suitable for magnetic recording, **consisting essentially of iron**, the individual particles being acicular and containing on average no more than 5 **pores** and consisting on average of no more than 2 metal **cores**.

2. A metal **powder** as claimed in claim 1, in which the individual particles contain on average no more than 1 **pore** and consist on average of no more than 1 metal **core**.

3. A metal **powder** as claimed in claim 1, containing about 0.1 to 7% by weight of at least one of cadmium, lead, calcium, zinc, magnesium, aluminum, chromium, tungsten, phosphorus (expressed as $P_2O_{5)}$ and/or boron (expressed as $B_2\ O_3$).

('799 Patent, col. 8, 11. 67-68, col.9, 11. 1-13).

The parties seek construction of the highlighted terms in these claims. For the reasons that follow, the Court construes the disputed terms as follows:

1. "pores"

[2] The parties do not dispute that a pore is a hole or cavity in a magnetic particle which may be open or closed. (DX 60; Buxbaum 11/15/96 Dep. 447-448). An "open pore" is a "cavity or channel communicating

with the surface of a particle." (DX 60; O'Grady Tr. 687). A "closed pore" is a "cavity or channel not communicating with the surface of a particle." (DX 60; O'Grady Tr. 687).

The parties' disagreement centers on the size of the pores contemplated by the Bayer patent. Pores can be classified into three size ranges: (1) micropores which are less than approximately 2nm, (2) mesopores which are between approximately 2nm and 50nm and (3) macropores which are above approximately 50nm. (DX 60; O'Grady Tr. 688). Bayer contends that the size of the pores is necessarily limited by their manner of detection and count as described in the '799 Patent. According to Bayer, this method is via bright field TEM analyses at approximately 120,000:1 magnification, i.e. the magnification present in Figures 1 through 3 of the '799 Patent. Individual pores appear as light-colored areas or spots in an otherwise darker TEM micrograph of the particle at the relevant magnification. According to Bayer one skilled in the art would realize that only mesopores would be detectable in the TEM analysis at the magnification of 120,000:1. Bayer contends that macropores would be excluded because their size exceeds the diameter of the particles, and micropores would be excluded because they cannot be seen, let alone counted and averaged at the 120,000:1 magnification. Thus, Bayer contends that it is only those pores visible in the TEM images at the relevant magnification that must be counted and averaged to determine the "on average" pore limitations of the '799 Patent.

In response, the Sony Defendants contend that the term "pore" should not include any size limitations. According to the Sony Defendants, one of ordinary skill in the art reading the '799 Patent would understand that the term "pore" refers to pores as commonly understood and that no size limitation or distinction between open and closed pores is stated or implied in the patent.

After reviewing the disputed term in light of the specification, the Court agrees with the Sony Defendants. The term pore is not limited to any size or distinction between open and closed pores. The specification contains no limitations about pore size whatsoever. If Bayer had wanted to limit the definition of pores to mesopores, it should have done so explicitly in the patent. *See e.g.* Beachcombers v. WildeWood Creative Products, Inc., 31 F.3d 1154, 1158 (Fed.Cir.1994) ("[A] patentee can be his own lexicographer provided that patentee's definition, to the extent that it differs from the conventional definition, is clearly set forth in the specification."); *Vitronics,* 90 F.3d at 1582. Absent clear language in the specification departing from the customary use of the term pore, the Court concludes that the word should be given its ordinary meaning as used by those skilled in the art, without the limitation Bayer seeks to impose. *See* Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1477 (Fed.Cir.1998).

Bayer contends that the patent should be limited by the illustrative figures, Fig. 1-3 of the patent, which both parties agree are at a magnification of 120,000:1. The Court disagrees. The inclusion of the TEMs in Bayer's patent does not inform someone of ordinary skill in the art how the TEMs should be used or that they should be used for counting pores. Although TEM analysis can be used for counting pores, other methods are available and are recommended by those skilled in the art to confirm the impressions one gains from TEM analysis. (O'Grady Tr. 846-847). Further, Dr. Buxbaum, one of the inventors of the patent testified that the figures in the '799 Patent were for illustrative purposes only and not for use in counting pores. (Buxbaum Tr. 339). Similarly, another inventor of the patent, Dr. Schroder, testified that he was not concerned about the size of the pores, because "the goal was to possibly have no pores because the recognition was prevailing with us that the fewer pores, the better." (Schroeder 9/27/96 Dep. at 127-128).

The Court's conclusion that the term "pore" is not limited by size is also supported by the understanding of the term by one skilled in the art. The parties agree that the literature recognizes three sizes of pores. (D.I.

476 at 25, para. 42; D.I. 477 at 34-35, para. 91). Further, Dr. Buxbaum, admitted that individuals researching magnetic particles were using high magnification TEMs to look for micropores in the late 1970s and 1980s. FN1 (Buxbaum Tr. 201). Thus, in the Court's view, micropores were encompassed in the term "pores" as used by those skilled in the art, and Bayer has not persuaded the Court otherwise.

FN1. Indeed, even Bayer's experts used TEMs at magnifications as high as 240,000:1 and 220,000:1 in connection with the proceedings related to Bayer's related Japanese patent. (Buxbaum Tr. 207-209, 213; DX 268E, PX 640). That Bayer's experts used TEMs at higher magnifications in a related patent further suggests that the '799 Patent is not limited by the TEM magnification in its examples.

That one skilled in the art would not exclude micropores from the term "pores" is further evidenced by the expert testimony of Professor O'Grady, which the Court finds credible. As Professor O'Grady testified:

I have heard testimony in this court that says that micropores are of no significance. Personally, as an expert in the field, I don't agree with that testimony. But if someone wished to place that restriction upon one skilled in the art, that person would have to state that in my opinion quite explicitly, *because it's contrary to the accepted [I]nternational [U]nion of [P]ure and [A]pplied [C]hemistry definition of pores*.

(O'Grady Tr. 829). Accordingly, the Court construes the "term" pore as a hole or cavity in a magnetic particle which may be open or closed, and the Court declines to impose any size limitation on the term "pore."

2. "cores"

[3] The term "cores" is used in the context of "metal cores." Bayer contends that the term "core" was not understood in the art at the time the '799 Patent was developed and that the inventors explicitly defined metal core in the patent specification as follows:

In the context of the invention, a metal core is understood to be a geometric subregion of an acicular particle which is formed by the merging of several individual pores which are thus no longer separated by matter. Needles dissociated into metal cores are formed, for example, when the metal needles are produced from acicular *a*-Fe_2O_3 by reduction, as a result of the fact that, dependent on the decrease in crystal volume during reduction, the pores increase in volume so that they ultimately overlap.

('799 Patent, col. 2, 11. 42-51). Thus, Bayer contends that the inventors defined "core" in terms of a metal needle (acicular particle) whose parts have become separated or dissociated from other regions of the needle. According to Bayer, under the patent's definition of "core," an acicular particle which has not dissociated or separated into two or more different geometric subregions consists of one core. The presence of different geometric subregions is detected by light colored gaps in the TEM image which indicate an absence of matter. Bayer contends that these subregions may have the same or different crystallographic orientation and areas of different crystallographic orientation do not qualify as cores unless they are separated from each other by light colored gaps as viewed by the TEM image at a magnification of about 120,000:1.

In response, the Sony Defendants contend that the term "core" is defined in the patent with reference to crystallographic orientation, which is omitted in the Bayer definition. Specifically, the Sony Defendants

highlight that part of the specification which contrasts "metal core" from the prior art "chain of spheres." In this regard, the specification states:

The expression "chain of spheres" is known from the literature for structures which have a similar appearance in photographs taken through a microscope. However, these structures are formed by agglomeration or growth of individual metal particles. The individual "spheres" consist predominantly of differently oriented crystallographic regions. *By contrast, the expression "metal core" as used herein is intended to designate a structure which may be imagined to have been formed from originally coherent material, the various metal cores of a needle having substantially the same crystallographic orientation.*

('799 Patent col. 2, 11. 51-62). According to the Sony Defendants, the definition of a "metal core" as a "subregion" of a certain crystallographic orientation is evident from the comparison between the prior art particles with "differently oriented crystallographic regions" and the "subregions" of the claimed invention with "substantially the same crystallographic orientation."

After reviewing the claim language in light of the specification, the Court agrees with the Sony Defendants. Bayer's definition of "core" overlooks the remaining portion of the specification which elaborates on what is meant by the term "metal core" and includes as an essential element of that term "substantially the same crystallographic orientation." The specification explicitly explains that, as used in the patent, the term "metal core" is designated to have a structure formed "from originally coherent material, the various metal cores of a needle having substantially the same crystallographic orientation." ('799 Patent, col. 2, 11. 60-62). That the crystallographic orientation is important to the definition of metal core is, in the Court's view, highlighted by the comparison to the prior art "chain of spheres," which consisted mainly of differently oriented crystallographic regions.

Bayer contends that the appropriate focus is not on the crystallographic regions, but on the lack of dissociation in the claimed invention as compared with the prior art. With regard to the prior art, Bayer explains:

As used in the '799 Patent, the terms "dissociated" and "dissociation" regarding the prior metal needles (which the patent seeks to avoid) mean that the needle form has been separated or divided into separate parts or subregions.

(D.I. 476 at 22-23, para. 39). In contrast, Bayer contends that the invention of the '799 Patent seeks to produce acicular (needle like) particles having a "coherent, non-dissociated external needed form" as depicted in Figure 1. According to Bayer, it is this "non-dissociated" form that makes the claimed invention different from the prior art needles which have "dissociated into a plurality of individual metal cores" as depicted in Figures 2 and 3. The Court disagrees with the distinction Bayer seeks to make between the claimed invention and the prior art. In the Court's view, the specification contradicts Bayer's position by highlighting the difference in crystallographic orientation as the key difference between the prior art and the claimed invention. That this is an important distinction between the claimed invention and the prior art was confirmed by one of the inventors of the '799 Patent, Dr. Schroeder, who testified as follows:

Q: So ... it's a logical conclusion from the preparation process of the particle that you would expect a single core to have a uniform crystallographic orientation?

A: Correct. In the literature the contrasting ... conclusion was arrived at with regard to the spheres. And

subsequent to that we did our considerations for our particles.

(Schroder 9/28/96 Dep. 178-179).

In addition to the language of the specification, the Court's definition of the term "core" is supported by a certified translation of a counterpart patent to the '799 patent. Both the English translation and the original German text were submitted to the PTO in connection with the '799 Patent to give Bayer the benefit of its German filing date under 35 U.S.C. s. 119. In relevant part, the English translation of the counterpart patent provides:

From the literature, the phrase "chain of spheres" has been used to describe structures having a similar appearance to these clusters when viewed under a microscope.... The individual "spheres" are predominately made up of regions with different crystallographic orientations. *Contrary to this, the expression "metallic core" shall be used herein to describe a structure that originates from an originally coherent material. The metallic cores in the needle generally all exhibit the same crystallographic orientation.*

(DX 699). Accordingly, the Court concludes that the term "core" is defined as a geometric sub-region of an acicular particle which is formed by the merging of several individual pores which are no longer separated by matter, but which have substantially the same crystallographic orientation.

3. "consisting essentially of iron"

[4] Bayer contends that the phrase "consisting essentially of iron" does not refer to a particular percentage of iron. Rather, Bayer contends that as long as iron makes up more than half of the metal content of the powder, then the powder consists essentially of iron.

In response, the Sony Defendants contend that the phrase "consisting essentially of iron" is a term of art signaling that the invention necessarily includes the listed ingredient, but excludes additional ingredients that would affect the basic and novel properties of the claimed invention. Applying this definition in the context of the '799 Patent, the Sony Defendants contend that the materials must be at least 90% reduced from iron oxide to elemental iron. According to the Sony Defendants, more than 10% iron oxide would have a material effect on the basic and novel properties of the claimed invention and would produce an inferior product. Further, the Sony Defendants contend that the prosecution history of the '799 Patent indicates that the claimed metal powder cannot contain more than 7% of other metal additives.

The phrase "consisting essentially of iron" is not defined in the '799 Patent. However, the Court of Appeals for the Federal Circuit has concluded that the drafter's use of the phrase "consisting essentially of" signals that the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do no materially affect the basic and novel properties of the invention." PPG Industries v. Guardian Industries Corp., 156 F.3d 1351 (Fed.Cir.1998).

Although the patent does not expressly quantify the amount of iron which must be present for the claimed invention to "consist essentially of iron," the Court concludes that the amount can be discerned from the specification. Specifically, the specification explains that Figure 3 depicts the prior art in which the dissociation of metal particles "is lower commensurate with the degree of reduction of only 80-90%." ('799 Patent at col. 2, 1. 39). In contrast, the specification explains that in the claimed invention, "the product is reducedthroughout." ('799 Patent at col. 6, 1. 46). Thus, to be distinguishable from the inferior prior art

product depicted in Figure 3 of the patent, the claimed invention must necessarily contain material which is more than 90% reduced from iron oxide to elemental iron.

The Court's conclusion regarding the percentage of elemental iron reduced from iron oxide is supported by the testimony of the inventor of the '799 Patent. During his deposition Mr. Schroder was asked the following question and gave the following answer:

Q: And what percentage of iron is required in order for you to conclude that the particles consist essentially of iron?

A: In the area of above 90 percent, depending on the multiplicity of the treatment and the preliminary steps, where the optimal reduction lies.

(Schroeder 9/30/96 Dep. 237). Further, the Court observes that there is no support in the specification for Bayer's counter definition that the phrase "consisting essentially of iron" means that the claimed invention contains more than half iron. Accordingly, the Court concludes that the phrase "consisting essentially of iron" means that the claimed invention necessarily includes iron and is open to unlisted ingredients that do no materially affect the basic and novel properties of the invention and that the claimed invention must necessarily contain material which is more than 90% reduced from iron oxide to elemental iron.

The Sony Defendants also urge the Court to include as part of its claim construction the quantities and types of unlisted ingredients which do not materially affect the basic and novel properties of the invention. Relying on the prosecution history of the '799 Patent, the Sony Defendants contend that the claimed metal powder cannot contain more than 7% of other metal additives Further, the Sony Defendants contend that Bayer disclaimed coverage of particles containing cobalt, nickle or tin, because they distinguished their invention from the prior art in the prosecution history by saying that the claimed invention "shows very good magnetic properties without being doped with expensive elements, as for example Co, Ni or Sn." (D.I. 477 at 44, citing DX 28 at 2).

[5] The Court is only required to define a claim "with whatever precision is warranted by the language of the claim and the evidence bearing on the proper construction ..." Id. at 1355. The Court may not, under the rubric of claim construction, give a claim "whatever additional precision or specificity is necessary to facilitate a comparison between the claim and the accused product," because claim construction is a legal question and infringement is a factual question. In the Court's view, the amount of other metal additives which would affect the basic composition of the claimed invention is not readily apparent in the claim language or specification, and is a factual question relevant to the infringement analysis. Accordingly, the Court declines to address the quantity or types of other additives that would have a material effect on the basic properties of the claimed invention in the context of its claim construction.

4. "powder"

[6] The Sony Defendants contend that the term "powder" refers to an aggregation of loose, small, solid particles. According to the Sony Defendants, "powder" is a more limited term than "particles," and "powder" must be loose, free flowing and unaligned. Because "powder" must be loose and free flowing, the Sony Defendants contend that "powder" is different than magnetic tape, which is not loose or free flowing.

In response, Bayer contends that the '799 Patent places no such limitations on the term "powder." Bayer

contends that the term "powder" refers to a conglomeration of individual particles, which may be loose, free flowing and unaligned, but which need not be. Thus, Bayer contends that the term "powder" describes metal particles both before and after they are embedded into magnetic tape.

The Court addressed the parties' respective arguments in its decision on the Sony Defendants' Motion For Summary Judgment That Tape Is Not Powder. (D.I.217, 326). In denying the Sony Defendants' motion, the Court stated:

After a review of the intrinsic evidence, the Court concludes that the term 'powder' is not limited in the manner SEL contends. Powder is used to describe a conglomeration of individual particles. Powder may be loose, free flowing and unaligned, but it need not be.

(D.I. 326 at 19). The Court is not persuaded that its prior conclusion was erroneous, and therefore, for purposes of claim construction, the Court adheres to the above-stated definition of the term "powder."

II. Direct Infringement

A. ***Applicable Law***

A patent is infringed when a person "without authority makes, uses or sells any patented invention, within the United States during the term of the patent...." 35 U.S.C. s. 271(a). A patent owner may prove infringement under either of two theories: literal infringement or the doctrine of equivalents. In this case, Bayer's case is premised upon the theory of literal infringement. Literal infringement occurs where each element of at least one claim of the patent is found in the alleged infringer's product. Panduit Corp. v. Dennison Mfg. Co., 836 F.2d 1329, 1330 n. 1 (Fed.Cir.1987); Robert L. Harmon, *Patents and the Federal Circuit* 195 & n. 31 (3d ed.1994). In determining whether a patent has been literally infringed, the patent owner has the burden of proof and must meet its burden by a preponderance of the evidence. SmithKline Diagnostics, Inc. v. Helena Lab. Corp., 859 F.2d 878, 889 (Fed.Cir.1988) (citations omitted).

Infringement is a two step inquiry. Step one requires a court to construe the disputed terms of the patent at issue. Step two requires a court to compare the accused products with the properly construed claims of the patent. Having construed the disputed terms of the '799 Patent, the Court will proceed to a comparison between the Sony Defendants' accused products and the claims as construed by the Court.

B. ***Whether Bayer Has Established By A Preponderance Of The Evidence That SEL Directly Infringed*** The '799 Patent

[7] Bayer asserts Claims 1-3 of the '799 Patent against SEL. By Memorandum Opinion and Order dated December 20, 2001, the Court limited the scope of Bayer's infringement argument to literal infringement. With regard to Claim 3 of the '799 Patent, the Court permitted Bayer to assert infringement either literally or by the doctrine of equivalents. Bayer has elected to pursue literal infringement with regard to Claim 3.

After comparing the accused products with the claims at issue, the Court concludes that Bayer has not established that SEL directly infringes the '799 Patent. In reaching this conclusion, the Court finds credible the testimony offered by the Sony Defendant's expert witness, Professor Kevin Dermott O'Grady.

1. Claims 1 and 2 of the '799 Patent

a. The powder element

Claims 1 and 2 of the '799 Patent first claim "[a] metal powder suitable for magnetic recording ..." As interpreted by the Court, the accused products meet the definition of powder. Although the accused products are in tape form, the Court has concluded that the term "powder" includes particles both before and after they are embedded in the tape.

b. The "consisting essentially of iron" element

Claims 1 and 2 of the '799 Patent also require the metal powder to "consist [ ] essentially of iron." The Court concludes that the accused products do not consist essentially of iron as required by these claims. The Court has construed the phrase "consisting essentially of iron" to mean that the claimed invention necessarily includes iron and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention and that the claimed invention must necessarily contain material which is more than 90% reduced from iron oxide to elemental iron. As tested by Professor O'Grady, the accused powders contain a range of about 48-52 percent elemental iron, and thus, do not satisfy the requirement that they "consist essentially of iron" as defined by the Court. (DX 643 at 15; O'Grady Tr. 781, 785). The accused powders also contain between 28.68% and 42.33% iron oxide and aluminum oxide. (DX 643 at 15). The Court is persuaded that these levels of iron oxide would materially affect the basic and novel properties of the claimed invention. Specifically, the presence of these oxides affects the dispersability of the particles, which is important to their ability to be coated into recording tape. (DX 643 at 15, 17). Further, the Court observes that Bayer does not challenge Professor O'Grady's findings regarding the content of iron and iron oxides present in the accused products. Rather, Bayer's argument is premised on its claim construction that "consisting essentially of iron" means containing about fifty percent element iron. Because the Court has previously rejected Bayer's claim construction, the Court concludes that Bayer has not proven that this element of the '799 Patent reads onto the accused products.

In addition to the high levels of oxides as compared to the claimed invention, the Court finds that the accused products also contain significant amounts of cobalt and nickel. (DX 643 at 15-17). That the presence of these additional elements would materially affect the basic properties of the claimed invention was confirmed by Professor O'Grady, as well as by Bayer's expert witnesses. (DX 643 at 15-17). For example, testifying on behalf of Bayer, Dr. Mallinson conceded that the presence of metal oxides and cobalt materially affect the physical and magnetic characteristics of a metal powder:

Q: In both iron oxide and iron metal powders, what is the effect of the addition of cobalt?

A: In the oxide particles, the principal effect is the raising of the coercivity. In the metal particles, the coercivity is also raised. But also, the saturation magnetization increases.

* * * * * *

Q: So cobalt can materially change a property such as coercivity in both the iron oxide and the metal particles?

A: Yes, it can.

(Mallinson Tr. 1166). Similarly, Bayer's expert, Dr. Buxbaum, testified:

Q: So are you saying that the use of 5- and 8-percent cobalt would have a material effect on the powder; is that right?

A: It has an essential effect on the magnetic properties.

Q: And it improves them; right?

A: It improves certain properties.

(Buxbaum Tr. 191). Because the definition of "consisting essentially of iron" excludes ingredients that would affect the basic and novel properties of the invention and the accused products contain sufficient amounts of cobalt, nickel and metal oxides such that their magnetic properties and coercivity are increased, the Court concludes that the accused products do not meet the "consisting essentially of iron" element in Claims 1 and 2 of the '799 Patent.

Bayer contends that the presence of cobalt and nickel in the accused products do not preclude a finding of infringement. Specifically, Bayer contends that the '799 Patent contemplates the addition of elements such as cobalt, because it recognizes that higher coercive forces may be obtained "if the metal powders consisting essentially of iron contain cobalt." ('799 Patent, col. 3, l. 8-17). The Court is not persuaded by Bayer's argument. The use of the phrase "consisting essentially of" excludes unlisted ingredients which materially affect the basic and novel properties of the invention. That the specification recognizes that the addition of metals like cobalt can result in higher coercive forces does not mean that the patent claims an invention which uses additional metals to achieve those higher coercive forces. Indeed, during the prosecution history of the '799 Patent, Bayer emphasized that its claimed invention was not doped with expensive elements like cobalt, nickel and tin. Explaining its invention to the Patent Examiner, Bayer stated:

Specifically, Fig. 1 shows a product in accordance with the present invention. This material is more stable than comparative metal pigments and shows very good magnetic properties *without being doped with expensive elements as for example Co [cobalt], Ni [nickel] or Sn [tin].*

(DX 28 at 2).FN2 That the presence of significant quantities of these metals (i.e. amounts sufficient to affect the basic properties of the invention) was not contemplated by the claimed invention is further confirmed by the testimony of the lead inventor of the '799 Patent, Mr. Schroeder. Mr. Schroeder recognized that "cobalt is expensive" and that Bayer believed that its invention was better than the prior art, because it could obtain high "coercivity values that were due to cobalt without cobalt." (Schroeder Tr. 434). Accordingly, the Court concludes that the presence of significant amounts of oxides, cobalt and nickel in the accused products precludes a finding that the accused products satisfy the "consisting essentially of iron" element in the claimed invention.

FN2. Bayer contends that it was not excluding elements like cobalt, nickel and tin from its invention, but merely acknowledging that "it was possible to obtain very good properties without [the presence of these metals], something which the prior art could not do." (D.I. 476 at 34, para. 58). However, its use of the phrase "consisting essentially of iron" in the language of the claim means that the claimed invention cannot contain quantities of unlisted ingredients that would affect the basic and novel properties of the invention. So, while elements such as cobalt are not excluded per se, they are excluded in quantities which would affect the basic and novel properties of the claimed invention. Because the Court finds that the accused products contain such quantities, the Court concludes that they do not infringe.

c. Pore content element

Claims 1 and 2 of the '799 Patent next focus on the pore content. Specifically, Claim 1 requires an average of no more than 5 pores, and Claim 2 requires an average of no more than 1 pore. The Court has concluded that the term "pore" refers to a hole or cavity in a magnetic particle which may be open or closed. The term "pore" has no size limitation and the term "pores" is not limited to those pores which are visible in a TEM analysis at a magnification of 120,000:1.

Examining the accused products in light of this definition of the term "pore," the Court concludes that the accused products do not satisfy the pore counts required by the '799 Patent. Using TEM analysis to count the number of pores and complementary measurements to confirm the impressions he gained from the TEMs and ensure that his work was representative and fair, Professor O'Grady concluded that the accused powders contained more than 5 mesopores per particle. (O'Grady Tr. 778-779, 846-847, 925; DX 643 at 13-14). Using higher magnifications, Professor O'Grady further found that the accused powders contained on average hundreds of micropores. (O'Grady Tr. 778-779; DX 643 at 13-14). Moreover, Professor O'Grady noted that his figures actually underestimated the number of pores visible, because only one part of a particle was visible at a time using the TEM technology. (O'Grady Tr. 778-779; DX 643 at 13-14).

Bayer contends that Professor O'Grady's estimations regarding the number of pores is inaccurate, because the TEMs he used were at a higher magnification than that required by the '799 Patent. As the Court has previously discussed in the context of claim construction, the '799 Patent is not limited to those pores which can be detected in a TEM image at a magnification of 120,000:1. Further, the Court is not persuaded by the pore counts obtained by Professor Williams. The counts made by Professor Williams were based on a definition of the term "pore" which is not in accordance with the Court's definition. In addition, Professor Williams relied only on TEM images for his counts, even though he himself acknowledged in a textbook that TEMs should not be used in isolation. (DX 74 at 11; Williams Tr. 286-287). In contrast, Professor O'Grady used other methods to confirm his pore counts. Further, the Court finds that some aspects of the methods used by Professor Williams may have compromised his results. For example, Professor Williams admitted that some of the particles he selected for examination may have been fragments of larger particles, but he did not check to determine whether the particles were broken. (Williams Tr. 293-296). Professor Williams also selected only one or two particles per image for analysis, while one of the inventor's of the patent, Dr. Buxbaum, used TEM images with approximately 20 individual particles and analyzed all the particles that could be seen. (Buxbaum Tr. 109, 143-144; Williams Tr. 308). The Court finds that these different counting methods, as well as the possibility of broken particles, could lead to inaccurate or misleading results rendering the testimony of Professor Williams on the subject of pore counts less credible than the testimony of Professor O'Grady. Accordingly, the Court concludes that the accused products fail to meet the claimed number of pores, as the term "pores" has been construed by the Court.

d. Core content element

As for the number of cores contemplated by the '799 Patent, Claim 1 requires an average of no more than 2 metal cores, and Claim 2 requires an average of no more than 1 metal core. The Court has defined the term "core" as a geometric sub-region of an acicular particle which is formed by the merging of several individual pores which are no longer separated by matter, but which have substantially the same crystallographic orientation. Comparing the accused products with this element of the '799 Patent, the Court concludes that the accused products contain substantially more cores than contemplated by Claims 1 and 2

of the claimed invention. Using dark field TEM studies, Professor O'Grady counted between 8 and 12 crystallites per particle, and in some cases even more. (O'Grady Tr. 776; DX 643 at 11). Further, using x-ray measurements and magnetic measurements of the activation volume of the accused products, Professor O'Grady confirmed that the average crystallite size of the accused products is substantially smaller than the length of the particle. This observation further supports Professor O'Grady's conclusion that the accused powders contain numerous metal cores. (DX 643 at 11).

Although bright field TEM images were not able to provide Professor O'Grady with an absolute count of the number of cores, Professor O'Grady did observe that using the bright field TEMs, the particles present consisted of a number of fused crystallites, and not one or two regions having substantially the same crystallographic orientation. (DX 643 at 13).

Bayer's primary challenge to Professor O'Grady's findings regarding the number of metal cores present in the accused products lies in its contention that Professor O'Grady findings are based upon an incorrect definition of the term "cores." Because the Court has previously rejected Bayer's claim construction argument, the Court concludes that the accused products do not satisfy the number of "cores" in Claims 1 and 2, as that term is construed by the Court. In addition, for the reasons discussed in the context of the Court's analysis regarding the pore element, the Court is not persuaded by the core counts obtained by Professor Williams. Professor Williams used a definition of "core" that is not consistent with the Court's definition, used only one or two particles for analysis and used only TEM images with no other techniques to confirm his results.

e. Summary

Because the elements of Claims 1 and 2 of the '799 Patent do not read onto the accused products, the Court concludes that the accused products do not infringe Claims 1 and 2 of the '799 Patent. Without a finding of literal infringement, SEL cannot be liable for direct infringement of Claims 1 and 2 of the '799 Patent.

2. Claim 3

Claim 3 of the '799 Patent refers to the metal powder as claimed in Claim 1, but with the additional limitations that the metal powder contain about 0.1% to 7% by weight of at least one doping and/or modifying agent, i.e. cadmium, lead, calcium, zinc, magnesium, aluminum, chromium, tungsten, phosphorus and/or boron. Because Claim 3 is dependent on Claim 1, the Court's infringement analysis regarding Claim 1 applies equally to Claim 3. Accordingly, the Court concludes that SEL is not liable for the direct infringement of Claim 3 of the '799 Patent.

3. Summary of Conclusions Regarding Bayer's Claim of Direct Infringement

In sum, the Court concludes that Bayer has not established that SEL directly infringed the '799 Patent. Accordingly, the Court will enter judgment against Bayer and in favor of SEL on Bayer's claims that SEL directly infringed Claims 1-3 of the '799 Patent.

II. Inducement Of Infringement

A. *Applicable Law*

[8] In pertinent part, 35 U.S.C. s. 271(b) provides "whoever actively inducesinfringement of a patent shall

be liable as an infringer." It is well-established that there cannot be inducement of infringement absent direct infringement. Syrrx, Inc. v. Oculus Pharmaceuticals, Inc., 2002 WL 1840917, (D.Del. Aug.9, 2002) (citing FMC Corp. v. Up-Right, Inc., 21 F.3d 1073 (Fed.Cir.1994)). As such, a claim for inducement of infringement is dependent upon proof of direct infringement. Epcon Gas Systems, Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1033 (Fed.Cir.2002).

B. *Whether Bayer Has Established That Dowa And/Or Sony Actively Induced Infringement*

Because Bayer has failed to establish by a preponderance of the evidence that SEL is liable for direct infringement, the Court concludes that Bayer has not established that Dowa and/or Sony actively induced infringement of the '799 Patent. Accordingly, the Court will enter judgment in favor of Dowa and Sony on Bayer's claim that they actively induced infringement of the '799 Patent. FN3

FN3. Having concluded that Bayer cannot establish liability for direct infringement or inducement of infringement, the Court will not address Bayer's claim of willful infringement or the Sony Defendants' arguments related to reasonable royalty, marking, prejudgment interest, enhanced damages and attorneys' fees.

III. Invalidity Over The Prior Art

A. *Whether* The '799 Patent ***Is Invalid As Anticipated***

As a general matter, for a patent to be invalid as anticipated under 35 U.S.C. s. 102(g), the party challenging validity must show that the potentially invalidating patent or invention (1) qualifies as prior art; (2) was not abandoned suppressed or concealed; and (3) is identical to the claimed invention or process. In order for a potentially invalidating invention to qualify as prior art, the party challenging validity must show that the potentially invalidating invention or patent has priority over the claimed invention. *See e.g.,* Thomson S.A. v. Quixote Corporation, 166 F.3d 1172, 1175 & n. 3 (Fed.Cir.1999).

To show identicality between prior art and the claimed invention, the party challenging validity must show that each and every step or element of the claimed process or invention is disclosed in a single prior art reference or embodied in a single prior art device or practice, either expressly or inherently. Hazani v. United States International Trade Commission, 126 F.3d 1473, 1477 (Fed.Cir.1997). "[I]nvalidity by anticipation requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." Advanced Display Sys., Inc. v. Kent State Univ., 212 F.3d 1272, 1282 (Fed.Cir.2000).

[9] For an element to be inherently present in a prior art reference it must necessarily be present in the reference. Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268 (Fed.Cir.1991). As the Federal Circuit has explained:

Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

Monsanto, 948 F.2d at 1268-1269. Whether a step or element is inherent in a prior art reference is a question of fact. Hazani, 126 F.3d at 1477.

The Sony Defendants contend that the '799 Patent is invalid as anticipated by three prior art references, the Phillips Patent, the Fuji Patent and the Montedison Patent. The Court will examine the Sony Defendants' arguments as they pertain to each of these references.

1. Whether the '799 Patent **is Anticipated by the Phillips Patent**

[10] The Phillips Patent, U.S. Patent No. 3,598,568, claims a method of preparing magnetically stable powder "mainly consisting of iron." (DX 10, Abstract). The process entails the precipitation of iron oxide hydrate (*a*-FeOOH) in the presence of oxygen. However, before the precipitation begins, doping agents like germanium, tin and/or aluminum are added. According to the Phillips Patent, it is essential that these agents be already present in the iron salt solution during the formation of the precipitate of iron oxide hydrate (*a*-FeOOH). (DX 10, col. 2, l. 4-9). Following the precipitation of the *a*-FeOOH, the *a*-FeOOH is reduced in hydrogen at a temperature between 250 (deg.)C to 500 (deg.)C to form an iron powder. (DX 10, Abstract).

The Sony Defendants contend that the Phillips Patent anticipates the '799 Patent, because the resultant powder produced from the process described in the Phillips Patent contains a low pore and core content. According to Professor O'Grady, the Phillips powders had on average approximately 2.3 metal cores and 0.05 pores when tested using TEM analysis. (O'Grady Tr. 761, 764-765). In addition, Professor O'Grady found that the Phillips powders had other properties similar to the powders produced from the '799 Patent, including similarly high squareness ratios.

After reviewing the Phillips Patent in light of the '799 Patent, the Court is not persuaded that the Sony Defendants have established by clear and convincing evidence that the '799 Patent was anticipated by the Phillips Patent. The Phillips Patent does not mention pores and does not discuss the impact of pores on magnetic values. The Phillips Patent also does not discuss whether pores are present in the metal powders produced by the Phillips process and does not discuss methods to reduce or eliminate pores. Similarly, the Phillips Patent does not disclose metal cores as that term is used in the '799 Patent.

The Sony Defendants contend that the fact that the reference does not expressly disclose these elements of the claimed invention is not relevant, because the elements are inherent in the Phillips Patent. The Court is not persuaded that the Sony Defendants have established inherency. Although Professor O'Grady identified similar numbers of cores and pores in the Phillips powders and the '799 powders, Professor O'Grady did not establish that these elements were "necessarily present" in the Phillips reference or that the Phillips' disclosure was sufficient to show that these elements were the natural result flowing from the process as taught. In the Court's view, Professor O'Grady's testimony did not adequately address this issue and was, at best, conclusory in so far as inherency was concerned. Moreover, the evidence suggests difficulties with the replication of the powders produced by the Phillips process rendering those replications suspect. For example, the Phillips Patent does not provide specific guidance regarding the starting *a*-FeOOH material and the evidence indicates that there are many different ways of making this materialusing many different parameters, all of which would have an important effect on the resulting iron oxides and metal powders. (O'Grady Tr. 1230-1231; Buxbaum Tr. 32-35, 377, 1072-1074, 1076-1077, 1080, 1088, 1090-1091, 1094-1099; Mallinson Tr. 1170-1171, 1188; Schroeder Tr. 459-461; Hisano Tr. 952, 1003-1005). The evidence also suggests that the process for making metal powders includes several conditions which could affect the end result such as the characteristic of ingredients used, ingredient and batch quantities, ingredient

concentrations, sequence of ingredient additions, types of pre-treatments, temperatures, agitation and stirrer speeds and the type of equipment used. (Mallinson Tr. 1170-1171; Buxbaum Tr. 32-35; Schroder Tr. 459-461; Hisano Tr. 952-953, 1003-1005). Yet, the Phillips Patent does not provide specific guidance regarding these conditions, and those who prepared the powders for Professor O'Grady's analysis were required to "fill-in" these gaps. As such, the Sony Defendants have not persuaded the Court that their reproduction was an accurate representative of the resulting powder from the prior art process described in Phillips. In addition, Professor O'Grady did not testify as to the remaining elements of the '799 Patent, and therefore, the Court finds that the evidence is insufficient to show that each element of the claimed invention was present in the prior art reference expressly or inherently, such that the '799 Patent was anticipated by the Phillips Patent. Accordingly, the Court concludes that the Sony Defendants have failed to establish by clear and convincing evidence that the '799 Patent was anticipated by the Phillips Patent.

2. The Fuji Patent

[11] The Fuji Patent, Japanese Patent Application No. 239-20939, was filed in the name of Akashi and published fifteen years before the '799 Patent's effective filing date. The Fuji Patent claims a process for making metal powders using a preliminary heating step. The *a*-Fe_2O_3 is heated at temperatures between 600 (deg.)C and 900 (deg.)C before it is reduced to metal. The goal of this heating step is to:

substantially enhance the packing density of said particles or the secondary grains consisting of an aggregate of the primary grains, and as a result acicular metallic iron particles obtained by the subsequent reduction will exhibit improved squareness properties in relation to their magnetic hysteresis loop as compared with the corresponding acicular metallic iron particles obtained by the same method but without said preheating treatment.

(DX 51). However, the Fuji Patent contains no data or analysis to show the actual effect of the preliminary heating on the particle morphology of the *a*-Fe_2O_3 or the morphology of the resulting metal powders.

As with the Phillips Patent, the Court concludes that the Sony Defendants have failed to establish by clear and convincing evidence that the '799 Patent was anticipated by the Fuji Patent. The Fuji Patent makes no mention of pores or their impact on magnetic values. In addition, the Fuji Patent does not disclose whether pores are present in the metal powders produced by the Fuji process and does not discuss methods to eliminate pores. Further, the Fuji Patent does not discuss cores.

As with the Phillips Patent, the Sony Defendants contend that the core and pore elements are inherent in the Fuji reference. The Court disagrees. Although Professor O'Grady identified a similar number of cores and pores in the powders produced by the Fuji process, Professor O'Grady did not establish that these elementswere "necessarily present" in the Fuji reference or that the Fuji disclosure was sufficient to show that these elements were the nature result flowing from the process as taught. In the Court's view, Professor O'Grady's testimony regarding inherency was conclusory in nature, and thus, insufficient to persuade the Court that the core and pore elements were inherently present in the Fuji reference. Further, the Court finds similar problems with regard to the reproducibility of the Fuji powders as those discussed in the context of the Phillips Patent, and the Sony Defendants have not persuaded the Court otherwise. In addition, the Court is not aware of any testimony or evidence directed to the remaining elements of the '799 Patent. Accordingly, the Court finds that the evidence is insufficient to show that each element of the claimed invention was present in the prior art Fuji reference either expressly or inherently, and therefore, the Court concludes that the Sony Defendants have failed to establish that the '799 Patent was anticipated by the Fuji

Patent.

3. The Montedison Patent

[12] The Montedison Patent, U.S. Patent No. 4,056,410, describes a process for preparing metallic iron based powders suitable for magnetic recording. This process is aimed at the pseudomorphic conversion of acicular particles of iron oxides or hydroxides to iron powders through reduction with a gas containing more than 50% by volume of hydrogen. (DX 20, Abstract). The Montedison patent recognizes that the pseudomorphic process is complicated in practice and attempts to avoid those complications by (1) incorporating certain additives like titanium and tin or cobalt nickel and silica into the oxide/hydroxide starting materials; (2) subjecting those materials to heating at temperatures of 400 (deg.)C to 550 (deg.)C in order to cause a reaction between the additive and the surface of the particle; and (3) reducing those materials in a 50% hydrogen containing gas at 340 (deg.)C to 420 (deg.)C. (DX 20, Col. 1, 11.27-45; Col. 2, 11.31-43; Col. 4, 11. 3-7).

The Sony Defendants contend that the '799 Patent is anticipated by Montedison, because powders produced according to the examples of the Montedison patent result in powders with low core and pore content. Specifically, Professor O'Grady determined that the Montedison powder produced according to Montedison Example 6 contained approximately 4 cores and 0.05 pores, while the Bayer powder produced according to Bayer Example 1 contained approximately 4.3 cores and 0.1 pores. (DX 619 at 23).

After reviewing the Montedison Patent in light of the '799 Patent, the Court is not persuaded that Defendants have established by clear and convincing evidence that the '799 Patent was anticipated by Montedison. As with the Phillips and Fuji Patents, the Montedison patent contains no disclosure regarding cores and pores, their effect on magnetic properties, the manner in which to reduce pore and core content, or the number of cores and pores present in the powders. Further, unlike the heating step of the '799 Patent which is directed to producing particles with low pore content and the structural stabilization described in the patent, the heating process described in the Montedison Patent is directed to causing a reaction between the additives and the surface of the particle. (DX 20, col. 4, 1. 3-7). Moreover, for the reasons discussed in the context of the Fuji and Phillips Patents concerning the accuracy of any reproductions of powders according to the prior art, the Court is not persuaded that the core and pore elements are present inherently in the Montedison reference. Indeed, even Professor O'Grady recognized that it is difficult to reproduce Montedison precisely, because it does not identify the precursor that was originally used. (O'Grady Tr. 806-807). Accordingly, the Court finds that the evidence presented by the Sony Defendants is insufficient to show that each element of the claimed invention was present in the Montedison reference either expressly or inherently, and therefore, the Court concludes that the Sony Defendants have not established that the '799 Patent was anticipated by the Montedison Patent.

B. *Whether* The '799 Patent ***Is Invalid As Obvious***

In pertinent part, 35 U.S.C. s. 103 provides that a patent may not be obtained "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art ..." 35 U.S.C. s. 103. Obviousness is a question of law which is predicated upon several factual inquiries. Richardson-Vicks v. Upjohn Co., 122 F.3d 1476, 1479 (Fed.Cir.1997). Specifically, in determining whether a patent is invalid as obvious over the prior art, the trier of fact must consider (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed subject matter and the prior art; and (4) secondary considerations of non-obviousness, such as commercial success, long felt but unsolved need, failure of

others, and acquiescence of others in the industry that the patent is valid. Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). As with invalidity based on anticipation, the party challenging validity on the grounds of obviousness must establish that the patents are invalid by clear and convincing evidence. C.R. Bard, Inc. v. M3 Systems, 157 F.3d 1340, 1351 (Fed.Cir.1998).

The Sony Defendants contend that the '799 Patent is obvious in light of the combination of two prior art references, the Fuji Patent (DX 51) and the Suzuki Patent, U.S. Patent No. 4,075,384 (DX 21). According to Professor O'Grady, the Fuji Patent shows a process of reducing the number of crystallites in a particle by heating at temperatures of 750 (deg.)C, and the Suzuki Patent shows a heating process for reducing porosity to improve the coercivity of ferromagnetic powders. Thus, according to the Sony Defendants, the combination of these references would render the '799 Patent obvious.

[13] After reviewing the relevant prior art in light of the evidence and the factors related to the obviousness inquiry, the Court concludes that the Sony Defendants have failed to establish by clear and convincing evidence that the '799 Patent was obvious in light of the Fuji and Suzuki references. In conducting an obviousness analysis, the Court must be mindful of the pitfall that the Federal Circuit has termed "hindsight syndrome." In re Werner Kotzab, 217 F.3d 1365, 1369-1370 (Fed.Cir.2000). According to the Federal Circuit, "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." In re Gartside, 203 F.3d 1305, 1319 (Fed.Cir.2000). Identification in the prior art of each element of the claimed invention is insufficient to defeat the patentability of the claimed invention as a whole. "Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." Kotzab, 217 F.3d at 1370 (citations omitted). The motivation, suggestion or teaching may come from explicit statements in the prior art, the implicit nature of the prior art as a whole, the knowledge of one of ordinary skill in the art at the time of the invention, or the nature of the problem to be solved. *Id*. (citations omitted). A "critical step" in making an obviousness determination is "casting the mind back to the time of the invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field." *Id*. at 1369 (citations omitted).

1. Level of One Skilled In the Art

For the purposes of the obviousness inquiry, it is undisputed by the parties FN4 that at the time of the filing of the German priority application for the '799 Patent in March of 1979, a person of ordinary skill in the art was someone with an advanced degree from a college or university in solid state chemistry, inorganic chemistry or physics. This person would also have been involved for several years in the preparation of magnetic recording materials, such as magnetic particles and their use in magnetic recording media, and would be aware of the practical issues faced by those in the industry in preparing these magnetic recording materials. (Buxbaum Tr. 86-87, Mallinson Tr. 1168).

FN4. The Court bases its statement that the description of one skilled in the art is undisputed on the fact that the Sony Defendants have not advanced their own description of one skilled in the art in the context of their obviousness argument. Accordingly, the Court accepts the characteristics identified by Bayer for purposes of defining one skilled in the art.

2. Scope and Content of the Prior Art

Although the Suzuki and Fuji references have relevance to the claimed invention for purposes of the obviousness determination, the Court is not persuaded that the Sony Defendants have established a motivation, suggestion or teaching for combining or modifying these references. Professor O'Grady identified and explained these references in his testimony, but he did not provide the Court with an explanation of why one skilled in the art would have selected these references to combine them in the manner suggested or why there would be an expectation of success from the combination. Indeed, an overview of the prior art suggests that there were many different approaches to the preparation of metal powders and that each different process included numerous parameters such as stirring rates, temperatures, purity of reactants and the like, all of which could influence the magnetic, physical and chemical properties of the final powder. (PTX 435 at 8025-8026). The difficulties in obtaining suitable powders is also evident from the extensive research and development efforts of Bayer, Sony and Dowa, which also suggest that it may not have been readily apparent to produce a successful product from the combination of the Suzuki and Fuji references. (See e.g. Schroeder Tr. 390-402; Hisano Tr. 946-947). Further, the Sony Defendants have not identified any express statements in the prior art pointing to a combination of the prior references and have not adequately explained how the nature of the prior art as a whole or the knowledge of one of ordinary skill in the art would have led one to combine these references.

3. Differences between the claimed invention and the relevant prior art

In addition, there are significant differences between the claimed invention and the Suzuki and Fuji prior art references. For example, although Suzuki discusses low pore content, it does not quantify pore content in the same manner as the '799 Patent. In addition, the Suzuki patent does not disclose core quantities. Further, the Suzuki reference expressly recognizes that low pore iron oxides alone do not result in suitable tapes and must be combined with a second layer of more porous iron oxides. (DX 51, col. 4, 11.57-col. 5, 11. 26). Similarly, the Fuji patent does not disclose, characterize or quantify pore or core content. In addition, the Fuji reference discloses low coercivities for the resulting metal powders and suggests that those values become worse when heated within the temperature ranges suggested by Fuji. (DX 51 at 5, Table 1). Further, the Fuji patent does not disclose the effect of preliminary heating on the morphology of the iron oxide or the morphology of the metal powders produced through the reduction of iron oxide.

4. Secondary indicia of non-obviousness

As for the secondary considerations of non-obviousness, the Court finds that there is evidence in the form of the extensive research done by the parties and others in the art which suggests that there was a long felt need in the industry for a suitable magnetic powder. However, the Court is not persuaded by Bayer's claims of commercial success. Bayer points to the success of the accused products and contends that "[t]he accused products could not function without the metal powders used therein and Sony/SEL's decision to use metal powders within the scope of the claims at issue rather than other alleged non-infringing alternatives confirms the importance of the claimed invention to Sony/SEL's sales of the accused products." (D.I. 476 at 130, para. 245). However, given the Court's conclusion of non-infringement, the Court cannot conclude that Bayer has established a nexus between commercial success and the merits of the patented invention. *See* Demaco Corp. v. F. Von Langsdorff Licensing, Ltd., 851 F.2d 1387, 1392 (Fed.Cir.1992) (holding that patentee bears the burden of proving a nexus between claimed secondary considerations and the merits of the patented invention). Accordingly, the Court gives little weight to the secondary indicia of non-obviousness in reaching its conclusion that the '799 Patent is not obvious.

5. Summary

In sum, the Court is not persuaded that the Sony Defendants have established by clear and convincing evidence a motivation, suggestion or teaching to combine the Fuji and Suzuki references. In addition, the Court finds that the difficulty in creating suitable metal powders for those skilled in the art coupled with the significant differences between the prior art and the claimed invention undermine a claim of obviousness. Accordingly, the Court concludes that the Sony Defendants have not established by clear and convincing evidence that the '799 Patent was obvious in light of the prior art.

IV. Invalidity Under 35 U.S.C. s. 112

The presumption that a patent is valid may be overcome by clear and convincing evidence that the claimed invention fails to meet the requirements of patentability set forth in 35 U.S.C. s. 112. *See* 35 U.S.C. s. 282; Hewlett-Packard Co. v. Bausch & Lomb, 909 F.2d 1464, 1467 (Fed.Cir.1990). In this case, the Sony Defendants challenge the validity of the '799 Patent pursuant to Section 112 on the following four grounds: (1) enablement; (2) written description; (3) omitted element, i.e. the failure to claim an "essential element" of the invention; and (4) indefiniteness. The Court will consider each of these grounds in turn.

A. *Whether* The '799 Patent ***Is Invalid Due To Lack Of Enablement***

[14] The statutory basis for the enablement requirement is found in 35 U.S.C. s. 112, para. 1, which provides in relevant part:

The specification shall contain a written description of the invention and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

For a patent to satisfy the enablement requirement, the specification must enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.' " Genentech, Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1365 (Fed.Cir.1997) (quoting In re Wright, 999 F.2d 1557, 1561 (Fed.Cir.1993)). As the Federal Circuit has explained, "[p]atent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable.... Tossing out the mere germ of an idea does not constitute enabling disclosure." Id. at 1366.

In determining whether undue experimentation is required to practice the claimed invention, the Court is guided by several factors, including: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance disclosed in the patent; (3) the presence or absence of working examples in the patent; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (6) the predictability of the art; and (7) the breadth of the claims. In re Wands, 858 F.2d 731, 737 (Fed.Cir.1988). Consideration of each of these factors, however, is not a mandatory part of the Court's analysis. Rather, the Court is only required to consider those factors which are relevant to the facts of each case. *See e.g.* Amgen, Inc. v. Chugai Pharm. Co., Ltd., 927 F.2d 1200, 1213 (Fed.Cir.1991). Although underlying factual inquiries must be made to determine whether a patent is enabled, enablement is ultimately a question of law. Enzo Biochem, Inc. v. Calgene, Inc., 188 F.3d 1362, 1369 (Fed.Cir.1999).

After reviewing the evidence as it relates to enablement, the Court concludes that the '799 Patent is invalid for lack of enablement. Claims 1-3 of the '799 Patent contain specific limitations concerning the number of cores and pores that are to be present in samples of the powders produced according to the specification. Although the specification contains a detailed analysis of how to prepare the claimed powders, the Court

finds that none of the powders actually created satisfy the core and pore limitations in the claims. Claim 1 of the '799 Patent requires each particle of powder to contain no more than 2 metal cores and claim 2 of the '799 Patent requires no more than 1 metal core. Yet, the metal particles produced by Professor O'Grady according to the specification of the '799 Patent contained on average 4.3 to 8.7 metal cores. (O'Grady Tr. 766-767; DX 619 at 12, 23). Further, a single core particle was never produced and was not depicted in any of the figures contained in the '799 Patent. As Professor O'Grady explained:

Q: You also heard Mr. Hutz point out that the patent states that a single-core particle is preferred in the Bayer patent?

A: Oh, yes, in the Bayer patent it states that.

Q: Were any single-core particles disclosed in the Bayer patent?

A: None that I could trace.

* * * * * *

Q: Is any single-core particle said to be illustrated in any of the figures?

A: No.

Q: Did you find any single-core particles in your reproduction of the four Bayer examples?

A: No.

Q: Does the '799 patent teach how to make a single-core particle?

A: No.

(O'Grady Tr. 926-927). Although Bayer challenges the definition of "cores" that Professor O'Grady used in his analysis, it does not appear to challenge the procedures by which he produced the powder. Indeed, even Bayer's own expert, Dr. Mallinson did not point out any errors in the experimental program carried out by Professor O'Grady:

Q: I am talking about the experimental work that was done under [Professor O'Grady's] direction at Dowa in Okayama, Japan, at Sony in Sendai, Japan, in his own facilities at York and, to some extent, in Madrid. And you have not pointed out a single error that was performed in any of those experimental programs; correct?

A: That's correct, yes.

(Mallinson Tr. 1184).

In addition to Professor O'Grady's inability to produce powders meeting the claim limitations, the Court further observes that even the examples illustrated in the patent do not meet the claim limitations. For example, Figure 1 of the patent purports to show an electron microscope photograph of metal needles according to the invention as produced in Example 1 of the '799 patent, yet there is no evidence in the patent

that Figure 1 meets the claim limitations. By the admission of one of the inventors of the '799 Patent, Figure 1 is inadequate to count cores and pores. (Buxbaum Tr. 339). Further, the Court observes that another inventor of the '799 Patent, Dr. Schroder, never recorded the number of cores and pores in the particles he produced, and there is no contemporaneous evidence that any of the '799 patent inventors counted cores and pores in their metal powders or the prior art, before Bayer filed its patent application. (Buxbaum Tr. 162-163, Schroeder 9/27/96 Dep. at 134).

Given the Court's claim construction, the absence of examples in the patent meeting the limitations of the claims and the testimony of Professor O'Grady, the Court is persuaded that the Sony Defendants have established by clear and convincing evidence that the specification fails to enable one skilled in the art to make and use the full scope of the claimed invention without undue experimentation. Accordingly, the Court concludes that the '799 patent is invalid due to lack of enablement.

B. *Whether* The '799 Patent ***Is Invalid For Lack Of An Adequate Written Description***

[15] To satisfy the "written description" requirement of 35 U.S.C. s. 112, the specification must convey with reasonable clarity to those skilled in the art that, as of the filing date, the applicant was in possession of the invention. Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-1564 (Fed.Cir.1991). While the applicant does not need to use exact terms or a particular form to describe the subject matter claimed, the "description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed." In re Gosteli, 872 F.2d 1008, 1012 (Fed.Cir.1989) (citations omitted). Stated another way, the invention must be described "in terms that establish that the applicant was in possession of the later-claimed invention, including all of the elements and limitations presented in the [claim], at the time of filing." Hyatt v. Boone, 146 F.3d 1348, 1353 (Fed.Cir.1998). Whether the written description requirement is satisfied is a question of fact that is determined on a case-by-case basis. Vas-Cath, Inc., 935 F.2d at 1562.

The policy behind the written description requirement is to prevent overreaching and *post hoc* claims that were not part of the original invention. As the Court of Appeals for the Third Circuit Stated in *Rengo Co. v. Molins Mach. Co.:*

Adequate description of the invention guards against the inventor's overreaching by insisting that he recount his invention in such detail that his future claims can be determined to be encompassed within his original creation.

657 F.2d 535, 551 (3d Cir.), *cert. denied,* 454 U.S. 1055, 102 S.Ct. 600, 70 L.Ed.2d 591 (1981).

The Sony Defendants contend that the specification fails to distinctly claim the invention with regard to the terms cores and pores, because one is unable to determine the number of cores and pores in an average particle. The Sony Defendants also contend that the term "consisting essentially of iron" is inadequately described, because it has no limit. In support of their position, the Sony Defendants advance the opinions of Professor O'Grady. (O'Grady Tr. 799-800).

After reviewing the specification and other evidence in light of the applicable law, the Court concludes that the Sony Defendants have failed to produce clear and convincing evidence establishing that the '799 Patent is invalid for lack of a written description. While the '799 patent did not define the term "pores," the Court has concluded that the meaning of that term would be evident to one skilled in the art. Similarly, with regard to the method to count cores and pores, the Court finds that once those terms are defined, one skilled in the

art would be able to discern the manner in which the cores and pores should be counted. Indeed, the Court observes that Defendants' expert, Professor O'Grady, was able to count the number of cores and pores present in the samples he studied. Further, the Court has previously concluded in the context of claim construction, that the term "consisting essentially of iron" is limited by the specification, prior art and the meaning in patent law of the phrase "consisting essentially of." Because there are parameters in the disclosure which adequately lead to a definition of this term, the Court cannot conclude that the written description is clearly inadequate. Accordingly, the Court is not persuaded that the written description is so lacking as to render the '799 Patent invalid.

C. *Whether* The '799 Patent ***Is Invalid For Indefiniteness***

[16] A patent satisfies the definiteness requirement if "those skilled in the art would understand what is claimed when the claim is read in light of the specification." Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576 (Fed.Cir.1986). "Furthermore, a patent need not teach, and preferably omits, what is well known in the art." Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384 (Fed.Cir.1986).

In support of its argument that the '799 Patent is invalid for failure to satisfy the definiteness requirements, the Sony Defendants rely upon the same arguments and evidence they advanced in the context of the written description requirement. Again, the Court is not persuaded that the Sony Defendants have established indefiniteness by clear and convincing evidence. Indeed, in the Court's view, Professor O'Grady's opinion on indefiniteness is more applicable to enablement and lack of written description. Specifically, Professor O'Grady does not contend that one of ordinary skill in the art would not understand the invention that is claimed, but rather that the invention is not adequately described and cannot be practiced without undue experimentation.

Further, as the Court has discussed in the context of the written description requirement, one skilled in the art would be able to understand the meaning of the term "pores" and the way to count cores and pores. Moreover, the Court has been able to delineate the meaning of the other terms which the Sony Defendants contend render the '799 Patent indefinite (i.e. the terms "metal powder," "cores," "consists essentially of iron") by reference to the claim language and disclosures in the specification. *See* LNP Engineering Plastics, Inc. v. Miller Waste Mills, Inc., 275 F.3d 1347, 1359 (Fed.Cir.2001) (concluding that district court correctly concluded that claim was not indefinite where court was able to delineate the meaning of the terms and the "tests and full disclosure of the patent sufficiently inform one of ordinary skill in the art of the bounds of the claim"). Accordingly, the Court is not persuaded that the '799 Patent is invalid for failing to satisfy the definiteness requirement.

D. *Whether* The '799 Patent ***Is Invalid For Failure To Satisfy The Omitted Element Test***

[17] Relying on the Federal Circuit's decision in Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473, 1479-1480 (Fed.Cir.1998), the "omitted element test" was originally created by Judge Walker of the Northern District of California in Reiffin v. Microsoft Corp., 48 U.S.P.Q.2d 1274, 1998 WL 397915 (N.D.Cal. Jul.10, 1998). Stemming from the written description requirement, the omitted element test results in patent invalidity where the claims as issued or asserted omit an element which was essential to the invention as originally described or disclosed.

However, the Federal Circuit itself has declined to address the omitted element test. Reiffin v. Microsoft Corp., 214 F.3d 1342 (Fed.Cir.2000) (declining to address the omitted element test, even though the district

court's decision was based solely on it). Further, at least one judge, Judge Newmann, has expressly rejected the concept of an omitted element test concluding that the test misstates the law regarding 35 U.S.C. s. 112 and creates an unworkable layer of litigation which threatens the long-standing drafting practice of most inventors. *Id*. at 1347 (concurring opinion).

Judge Walker has since reconsidered the omitted element test in light of Judge Newmann's concurring opinion and concluded that such a test "could not be sustained." 158 F.Supp.2d 1016, 1024 (N.D.Cal.2001). Prior to Judge Newmann's concurrence in *Reiffin* and Judge Walker's subsequent denunciation of the omitted element test, this Court expressed hesitancy to embrace such a test. Purdue Pharma, L.P. v. F.H. Faulding & Co., 48 F.Supp.2d 420, 431 (D.Del.1999). Specifically, the Court referred to the "test" as only one factor in determining whether the applicant was in possession of the invention at the time of filing.

In this case, the Sony Defendants contend that the '799 Patent is invalid, because it omits the two-stage reduction process described in the specification. The Court is not persuaded by Defendant's argument. First, the Court is not persuaded that the "omitted element test" is a viable ground upon which to declare a patent invalid. As Judge Newmann noted in criticizing the omitted element test, the "specification must of course describe the claimed invention, [but] it is well established that the claims need not include every component that is described in the specification." 214 F.3d at 1347 (citations omitted).

Second, the Court is not persuaded that the two-step process is directed to the claims asserted in this litigation. Reading the claims and specification as a whole, the Court finds that the two-step process is not directed to the first aspect of the invention, the metal powders claimed in Claims 1-3, but to the second aspect of the invention, the process for producing those metal powders. ('799 Patent, col. 9, 11.20-31, col. 10, 11.1-2). Thus, the Court cannot conclude that the asserted claims of the '799 Patent are invalid for failing to claim the two-step reduction process. Accordingly, the Court concludes that the '799 Patent is not invalid on the grounds that it omitted an essential element.

V. Unenforceability Due To Inequitable Conduct

A. *The Inequitable Conduct Standard*

[18] As a general matter, patent applicants and their patent attorneys have a duty of candor, good faith and honesty in their dealings with the PTO. 37 C.F.R. s. 1.56(a). The duty of candor, good faith and honesty includes the duty to submit truthful information and the duty to disclose to the PTO information known to the patent applicants or their attorneys which is material to the examination of the patent application. Elk Corp. of Dallas v. GAF Bldg. Materials Corp., 168 F.3d 28, 30 (Fed.Cir.1999). Breach of the duty of candor, good faith and honesty may constitute inequitable conduct. *Id*. If it is established that a patent applicant engaged in inequitable conduct before the PTO, the entire patent application so procured is rendered unenforceable. Kingsdown Medical Consultants v. Hollister Incorporated, 863 F.2d 867, 877 (Fed.Cir.1988).

[19] To establish inequitable conduct due to the failure to disclose material information or the submission of false information, the party raising the issue must prove by clear and convincing evidence that (1) the information is material; (2) the knowledge of this information and its materiality is chargeable to the patent applicant; and (3) the applicant's submission of false information or its failure to disclose this information resulted from an intent to mislead the PTO. *Id*. Information is deemed material if there is a substantial likelihood that a reasonable Examiner would have considered the material important in deciding whether to issue the application as a patent. *See* Elk Corp., 168 F.3d at 31; Mobil Oil Corp. v. Advanced Environmental

Recycling Technologies, Inc., 869 F.Supp. 251, 254 (D.Del.1994). Accordingly, a reference does not have to be prior art to be material information that must be disclosed to the PTO. *See* 37 C.F.R. s. 1.56; Mobil Oil Corp., 869 F.Supp. at 255. Further, "an otherwise material reference need not be disclosed if it is merely cumulative of or less material than other references already disclosed." Elk Corp., 168 F.3d at 31.

Intent to deceive is rarely established by direct evidence, and therefore, may be inferred from the facts and circumstances surrounding the applicant's overall conduct. *See* Molins PLC v. Textron, Inc., 48 F.3d 1172, 1180 (Fed.Cir.1995). In determining whether the applicant's overall conduct evidences an intent to deceive the PTO, the Federal Circuit has emphasized that the challenged "conduct must be sufficient to require a finding of deceitful intent in the light of all the circumstances." Kingsdown Medical Consultants, 863 F.2d at 873. Once materiality and intent have been established, the court must conduct a balancing test to determine "whether the scales tilt to a conclusion that 'inequitable conduct' occurred." Critikon, Inc. v. Becton Dickinson Vascular Access, Inc., 120 F.3d 1253, 1256 (Fed.Cir.1997). Generally, the more material the omission, the less the degree of intent that must be shown to reach a conclusion of inequitable conduct. Elk Corp., 168 F.3d at 32.

The question of whether inequitable conduct occurred is equitable in nature. As such, the ultimate question of whether inequitable conduct occurred is committed to the sound discretion of the trial court. Elk Corp., 168 F.3d at 30-31; Kingsdown Medical Consultants, 863 F.2d at 876.

B. *Whether Bayer Engaged In Inequitable Conduct Before the PTO Rendering* The '799 Patent ***Unenforceable***

[20] The Sony Defendants contend that Bayer engaged in inequitable conduct before the PTO rendering the '799 Patent unenforceable. Specifically, the Sony Defendant contend that Bayer intentionally withheld material prior art from the Patent Examiner that was included in the draft application of the '799 Patent. These patents include the Bayer patents, the Montedison Patent, the Phillips Patents and the Suzuki Patent. In addition, the Sony Defendants contend that Bayer intentionally made a series of material misrepresentations including: (1) misrepresenting the prior art as having poor magnetic properties while claiming that the claimed invention had superior performance and (2) selecting poor examples of TEM images of the prior art to show a false contrast between Bayer's invention and the prior art.

In response, Bayer contends that the prior art is either not material or it was disclosed to the PTO. Bayer further contends that it did not make any material misrepresentations to the PTO, and that the Sony Defendants cannot establish an intent to deceive the PTO by clear and convincing evidence.

1. The Allegedly Withheld Prior Art

In the Court's view, the references allegedly omitted by Bayer have some degree of materiality, though not a high degree of materiality. The allegedly withheld references have some relevance to the claimed invention and to the path Bayer followed in creating its invention. However, these references do not reflect the claimed invention directly and do not render the claimed invention invalid as either obvious or anticipated. *See e.g.* Life Technologies, Inc. v. Clontech Labs. Inc., 224 F.3d 1320, 1325 (Fed.Cir.2000) (citing 35 U.S.C. s. 103(a)) (stating that "the path that leads an inventor to the invention is expressly made irrelevant to patentability by statute"). Indeed, as the Court has discussed previously in the context of invalidity, there are numerous differences between the claimed invention and the prior art. These differences weigh in favor of a finding that the allegedly withheld references are not highly material. Halliburton Co. v. Schlumberger Technology Corp., 925 F.2d 1435, 1441 (Fed.Cir.1991).

In addition to the low degree of materiality of these references, the Court cannot conclude that these references were intentionally withheld from the Patent Examiner. As the Federal Circuit has recognized, "[f]raud cannot consist of a failure to duplicate what is in the file wrapper." Environmental Designs, Ltd. v. Union Oil Co. of California, 713 F.2d 693, 698 (Fed.Cir.1983). References that are before the patent examiner cannot be found to have been withheld from the PTO, regardless of whether these references were cited by the patentee or uncovered by the examiner and regardless of whether or not the referencewas the basis for rejection by the examiner. Fiskars, Inc. v. Hunt Mfg. Co., 221 F.3d 1318, 1327 (Fed.Cir.2000).

In this case, the Court finds that the allegedly withheld references were before the examiner or cumulative of other art already before the example. For example, the U.S. Montedison counterpart was cited to the PTO and it included the examples and magnetic values which make the Montedison German application relevant to the claimed invention. (PTX 373, p. 43; PTX 487, Col. 2, 11. 42-43, Col. 4, 11. 24-31, Examples 1-8). *See e.g.* Glaverbel Societe Anonyme v. Northlake Marketing & Supply, Inc., 45 F.3d 1550, 1557 (Fed.Cir.1995) (affirming district court's conclusion of no inequitable conduct where patentee failed to disclose United States counterpart to foreign patent that was already disclosed).

Similarly, with regard to the collection of Phillips Patents, the Court finds that Bayer cited at least one of the Phillips Patents to the PTO (PTX 495) and that the United States counterparts of two other allegedly withheld Phillips references were also of record during the prosecution of the '799 Patent. (PTX 435, p. 8026; PTX 484, p. 1; O'Grady Tr. 1233-1234). In the Court's view, Bayer's citation to these references undermines the Sony Defendant's allegation of intent to deceive.

With regard to the prior art work of Bayer, the Court also finds that these references were either disclosed to the PTO or cumulative of other references before the PTO. Two references to Bayer's iron oxide work were identified in a Search Report from the European Patent Officer given to the PTO by Bayer. (PTX 373, pp. 48-50). These references included prior art directed to iron oxides similar to the types described in Examples 1-4 of the '799 Patent, i.e. iron oxides containing few pores. In addition, the '799 Patent itself identifies a Bayer published German patent application directed to a hydrothermal process of producing low pore iron oxides. ('799 Patent, col. 5, ll. 44-53). Defendants have not established that other Bayer references were any more material than the references already cited, and therefore, the Court finds that the Bayer work was either disclosed or cumulative to that which was already before the PTO.

As for the Suzuki Patent, the Court notes that this Patent was not disclosed to the PTO. However, the relevance and materiality of the Suzuki patent to the claimed invention is even more tenuous than the materiality of the other patents discussed. Suzuki discloses a method to count pores, a method which is not part of the claimed invention. Suzuki also does not discuss any way of obtaining metal powders with a particular pore count. Assuming the materiality of Suzuki, however, the Court finds that it is cumulative of other iron oxide art cited to the Examiner. Specifically, patents describing magnetite, an iron oxide pigment with low pore volumes, were disclosed to the PTO. (PTX 493, 494, 373 at 50). In the Court's view, the Sony Defendants have not established that Suzuki is more relevant than those references which were already disclosed to the Examiner, and therefore, the Court concludes that Suzuki is a cumulative reference which was not required to be disclosed to the Patent Examiner.

In support of their inequitable conduct argument, the Sony Defendants direct the Court to the draft patent application prepared by Dr. Schroeder. The Sony Defendants contend that Bayer's decision to delete prior art references contained in the draft when preparing the final application evidences intent to deceive the PTO.

In the context of the other evidence in this case including the low degree of materiality and the disclosure of the allegedly withheldpatents, the Court is not persuaded that this conduct is sufficient to establish an intent to deceive the PTO. For example, Dr. Schroeder testified that these references were not intentionally omitted, but rather, that he did not believe the deleted references were necessary to distinguish the invention over the prior art. (Schroeder Tr. 461-463).

Given the tenuous degree of materiality of the allegedly withheld prior art references, the fact that many of these references were either disclosed and/or cumulative to that which was disclosed, and the lack of other evidence supporting an intent to deceive the PTO, the Court concludes that the Sony Defendants have not established that Bayer intended to deceive the PTO. Stated another way, the Court does not find the circumstantial evidence presented by the Sony Defendants to be sufficient to establish intent to deceive clearly and convincingly. Accordingly, the Court cannot conclude that Bayer engaged in inequitable conduct before the PTO by failing to disclose material prior art.

2. The Alleged Misrepresentations

The Sony Defendants allege that Bayer misrepresented the prior art as having poor magnetic properties while claiming that the claimed invention has superior magnetic properties. Specifically, the Sony Defendants direct the Court to a statement in the patent concerning the squareness ratio of the prior art. In pertinent part, the '799 Patent states that "[t]he considerable dissociation of the particles obtained by known processes is also reflected in a low quotient of remanence and saturation magnetization [i.e squareness ratio] of less than 0.5." ('799 Patent col. 2, ll. 16-19). The Sony Defendants contend that this statement is a misrepresentation because Bayer knew that the Montedison Patent described materials with considerably higher squareness ratios in the range of 0.55, 0.63, and 0.7.

After reviewing the evidence as it relates to this issue, the Court concludes that the Sony Defendants have not established that Bayer made an intentionally and materially false or misleading statement regarding the prior art and the claimed invention. The '799 Patent is not directed to metal powders with a specific coercivity or squareness value. Rather, the '799 Patent is directed to metal powders with unique physical properties, namely particular numbers of cores and pores, and these properties are specifically recited in the asserted claims. The text of the '799 Patent discusses the difficulties associated with maintaining particle uniformity and describes the dissociation of those particles. The '799 Patent also discloses that this dissociation is evidenced by a low quotient remanence and saturation magnetization of less than 0.50. ('799 Patent, col. 1, l. 56, col. 2 l. 20). However, this low quotient remanence and saturation magnetization is not what distinguishes the claimed invention over the prior art and is not cited in any of the asserted Claims 1 through 3 of the '799 Patent. Further, the '799 Patent does not state that there were no prior art references disclosing metal powders with values above 0.5 and does not purport to be the first invention of such a powder.

That Montedison disclosed high magnetic values, in the Court's view, does not render the statements in the '799 Patent misleading. Magnetic properties are not the sole criteria by which the superiority of metal powders can be judged. (Schroeder Tr. 400, 422-423, 579-580, 582-583, 586; O'Grady Tr. 808-811). The high magnetic properties described in the Montedison patent can be attributed to the presence of certain additives like cobalt. (Buxbaum Tr. 190-192). These valuesare not linked in the Montedison patent to the number of cores and pores as they are in the '799 Patent. Indeed, the Montedison Patent does not make any disclosure regarding cores and pores and does not provide any information regarding the physical structure of the resulting metal powders. (Buxbaum Tr. 174-177). Accordingly, the Court is not persuaded that the

Sony Defendants have clearly and convincingly established that Bayer intentionally misled the PTO regarding its statement about the magnetic values of the prior art as compared to the claimed invention.

The Sony Defendants next contend that Bayer selected poor examples of TEM images of the prior art and a superior TEM example of the claimed invention to show a false contrast between the claimed invention and the prior art. The Sony Defendants contend that these TEM images were misleading because they were not identified as depicting the prior art known as Montedison, and because poor examples of the prior art were deliberately selected to create a misrepresentation when compared to the TEM of the claimed invention.

After reviewing the evidence as it relates to this issue, the Court concludes that the Sony Defendants have not established that Bayer made intentional misrepresentations by its selection of TEM examples. The Sony Defendants rely on the testimony of Professor O'Grady that the TEM image of Figure 1 was not representative of the claimed invention, because other images were worse. However, Professor O'Grady did not identify these other allegedly "worse" images and admitted that he did not know if he had seen all of the TEM images. (O'Grady Tr. 790-793). Professor O'Grady also admitted that he only relied upon the four TEM images in his report to make his determination that Figure 1 was not representative. (PTX 358, Exhibits 2-4). In contrast, Bayer maintains that Figure 1 of the '799 Patent was selected by Bayer as a representative example of the claimed invention. (Schroeder Tr. 443-452; Buxbaum Tr. 166-168). Figure 1 was derived from experimentation performed by Dr. Schroeder in accordance with Example 1 of the '799 Patent, and the example is meant to illustrate metal needles produced according to the claimed invention. ('799 Patent, col. 2, ll. 32-34). In the Court's view, the Sony Defendants have not presented sufficient evidence undermining Bayer's contentions, and thus, have not met their burden of establishing that Bayer intentionally selected a higher quality TEM image of its powder in order to produce a misleading effect.

Similarly, with regard to the TEM images allegedly depicting the prior art, the Court concludes that the Sony Defendants have not established by clear and convincing evidence that Bayer's selection of these TEM examples was made to intentionally mislead or deceive the PTO. As explained in the specification of the '799 Patent, Figures 2 and 3 were selected as representative examples of particles produced according to the prior art depicting differing extents of cores and pores. These images were produced through experiments conducted by Dr. Schroeder in accordance with the disclosures in the Montedison patent. (See e.g. PTX 417 at 4771, PTX 410 at 3383, PTX 418 at 4853). Although based on Montedison, these TEM images were not made or selected for the purpose of distinguishing the claimed invention over Montedison. (Buxbaum Tr. 166-169). Rather, these images were selected to show particles which were highly agglomerated, non-acicular, highly porous and/or dissociated into smaller subunits. Although some of these images had good magnetic values, Dr. Schroeder found them to be inferior to the claimed invention, because of the nature of their chemical and physical properties. (Schroeder Tr. 445-446, 448-452). Defendants have not persuaded the Court that Bayer misrepresented these TEM images or that they intentionally selected them to deceive the PTO about their invention as compared to the prior art. (Schroeder Tr. 451-452). Accordingly, the Court concludes that the Sony Defendants have failed to establish that Bayer engaged in inequitable conduct before the PTO as a result of its selection of TEM images for inclusion in the '799 Patent.

VI. Laches

A. *Legal Standard For The Defense of Laches*

[21] Laches is an equitable defense to a claim for patent infringement. A.C. Aukerman Co. v. R.L. Chaides Construction Co., 960 F.2d 1020, 1028 (Fed.Cir.1992) (en banc). Laches is defined as "the neglect or delay in bringing suit to remedy an alleged wrong, which taken together with lapse of time and other

circumstances, causes prejudice to the adverse party and operates as an equitable bar." Id. at 1028-1029. To establish the defense of laches, the defendant has the burden of proving two elements: (1) that the plaintiff delayed in filing suit for an unreasonable and inexcusable length of time after the plaintiff knew or reasonably should have known of its claim against the defendant; and (2) the defendant suffered material prejudice or injury as a result of the plaintiff's delay. Id. at 1028.

[22] In determining whether the plaintiff's delay in filing suit was unreasonable, the court must look to the period of time beginning when the plaintiff knew or reasonably should have known of the defendant's alleged infringing activity and ending when the plaintiff filed suit. In addition, the court should consider any reasonable excuses by the plaintiff for the delay including, but not limited to: (1) other litigation; (2) negotiations with the accused; (3) possible poverty or illness under limited circumstances; (4) wartime conditions; (5) the extent of the alleged infringement; and (6) a dispute over the ownership of the asserted patent. Id. at 1033 (citations omitted).

[23] Although no fixed period of time is considered per se unreasonable, a presumption that the delay is unreasonable arises if the delay is more than six years. Id. at 1035-1036. However, this presumption may be rebutted if the plaintiff is able to show sufficient evidence to generate a genuine issue of fact as to the existence of the laches elements. Id. at 1037-1038. If the presumption of laches is rebutted, the defense of laches is not eliminated. The defendant can still establish laches by proving that the laches elements exist by a preponderance of the evidence. Id. at 1038.

[24] With regard to the second prong of material prejudice, the defendant can show either economic prejudice or evidentiary prejudice. Evidentiary prejudice may arise where the delay has curtailed the defendant's ability to present a full and fair defense on the merits due to the loss of evidence, the death of a witness, or the unreliability of memories. Id. at 1033. Economic prejudice arises where a defendant suffers the loss of monetary investments or incurs damages which would have been prevented if the plaintiff had filed suit earlier. *Id*.

Because the defense of laches is equitable in nature, "mechanical rules" do not govern its application. *Id*. at 1032. Rather, the court must consider all of the facts and circumstances of the case and weigh the equities of the parties. *Id*. Whether the defense of laches applies in a given case is committed to the sound discretion of the district court. *Id*.

B. *Whether Bayer's Claim Is Barred By Laches*

[25] After weighing the facts and circumstances in this case and the relative equities of the parties, the Court concludes that the defense of laches is inapplicable in this case. Although the Sony Defendants have some evidence suggesting that Bayer knew in the early to mid-1980s that Sony was in need of metal powder, that Bayer was interested in meeting Sony's production needs, and that Bayer conducted some market research on various metal powders including the Dowa powders produced for Sony, the Court is not persuaded that this evidence was sufficient to put Bayer on constructive notice concerning infringement. First, the evidence suggests that much of Bayer's testing on competitor's powders was limited in scope and was not performed by those responsible for patent issues. Moreover, in evaluating its powders and other powders, Bayer discovered not evidence suggesting that its patent was infringed, but evidence suggesting that its powders were inferior to other powders and could not be made to perform within the parameters required by potential customers. (Leitner 7/8/97 Dep. 71-72). Thus, the Court is not persuaded that Bayer knew or should have known of the Sony Defendants' alleged infringement in the early to mid-1980s.

Rather, the Court is persuaded that the triggering event which put Bayer on constructive notice of the Sony Defendants' alleged infringement was Dowa's vigorous, but unsuccessful opposition to Bayer's Japanese counterpart to the '799 Patent in 1992. (Steiling DTr. 6-7, 25-28). Upon suspecting infringement, Bayer instituted an investigation with the cooperation of its marketing, technical and patent departments. Upon concluding that Dowa was infringing Bayer's '799 patent in May 1993, Bayer notified Dowa resulting in a series of correspondence regarding the alleged infringement and an effort to resolve the matter. Upon realizing that it would not be able to resolve the dispute with Dowa, the source of Sony's alleged infringing powder, Bayer contacted Sony in March 1994. Again correspondence and negotiations between the parties followed. Bayer then filed its complaint in January 1995, two years after it began its infringement investigation. Given the period of investigation needed for Bayer to reach its conclusion regarding the alleged infringement, its notification to Sony and Dowa, and its subsequent attempts at negotiation, the Court is persuaded that Bayer did not unreasonably delay in filing suit from the time it suspected infringing activity by Dowa in 1992.

The Court is also not persuaded that the facts and circumstances of this case demonstrate the economic and/or evidentiary prejudice needed to establish laches. There is evidence that Sony and Dowa spent money expanding their facilities and advertising products, however, the Court is not persuaded that these expenditures were linked to Bayer's delay in filing suit. For example, Dowa continued to expand its facility after being notified of alleged infringement by Bayer, suggesting that it would have expanded regardless of whether it knew of Bayer's claim. (DX 579). Further, the Sony Defendants spent money advertising video equipment, but this money was not linked directly to the accused products. (DX 403 at S20841).

With regard to alleged evidentiary prejudice, the Sony Defendants are required to specifically point out the prejudice that they suffered from the alleged absence of witnesses or evidence. "Conclusory statementsthat there are missing witnesses, that witnesses' memories have lessened, and that there is missing documentary evidence, are not sufficient." Meyers v. Asics Corp., 974 F.2d 1304, 1308 (Fed.Cir.1992). In this case, Defendants contend that they suffered prejudice because Dr. Hund, one of the five inventors of the '799 Patent was too sick to be deposed, and Mr. Horn, the attorney who prosecuted the '799 Patent was deceased. However, the Sony Defendants have not identified any testimony that only these witnesses could have provided and have not established to the Court's satisfaction that the absence of these witnesses prejudiced their defense.

In addition, the Sony Defendants contend that they were prejudiced by the absence of several missing documents, including documents related to the prosecution of the '799 Patent which were destroyed by the Sprung Horn firm which prosecuted the '799 Patent for Bayer. However, the Court notes that Bayer provided Sony with its own counterpart copy of this file. (DX 138). With regard to other allegedly missing documents, the Sony Defendants have not identified why this information would have been important to their case. Further, in the Court's view, the extensive discovery in this case undermines any allegation that the Sony Defendant's were prejudiced in their ability to mount a defense as a result of Bayer's alleged delay in filing suit. Accordingly, after weighing the facts and circumstances of this case and balancing the equities, the Court concludes that Bayer's claim is not barred by the equitable defense of laches.

VII. Abuse Of Process

A. *Legal Standard For Abuse Of Process Claims*

[26] To establish a claim for abuse of process, the defendant must prove that the plaintiff had an "ulterior

purpose" and committed "a willful act in the use of the process that is not proper in the regular conduct of the proceedings." Feinman v. Bank of Delaware, 728 F.Supp. 1105, 1115 (D.Del.), aff'd, 909 F.2d 1475 (3d Cir.1990). "There must be '[s]ome definite act or threat not authorized by the process or aimed at an objective not legitimate in the use of process ... there is no liability where the [plaintiff] has done nothing more than carry out the process to its authorized conclusion.' " *Id*. (citations omitted).

In this case, the Sony Defendants contend that Bayer is liable for abuse of process because Bayer's ulterior purpose in filing this lawsuit and pursuing this litigation was to coerce a settlement from Dowa. According to the Sony Defendants Bayer initiated and continued this litigation, even though it was in possession of facts that affirmatively undermined its claim, including adverse validity and infringement rulings on Bayer's Japanese counterpart patent. Further, the Sony Defendants contend that Bayer engaged in unnecessary and excessive discovery and violated the Court's protective order.

B. *Whether Bayer's Filing Of This Lawsuit And Pursuit Of This Litigation Constitutes An Abuse Of Process*

[27] After reviewing the evidence as it relates to the Sony Defendant's abuse of process claim, the Court concludes that Bayer's pursuit of this litigation did not amount to an abuse of process. As the owner of a presumptively valid patent, Bayer was entitled to pursue litigation to defend its patent. That Bayer tried to settle this action with Dowa prior to filing suit cannot be construed as form of extortion. Rather than an abuse of process, the pursuit of settlement is a valid, legitimate and worthy part of the process.

As for the impact of the Japanese proceedings on Bayer's ability to commence this action, the Court is not persuaded that the adverse rulings of the Japanese courts were sufficient to "affirmatively undermine" Bayer's claim such that Bayer should have abandoned its attempts to enforce its United States patent rights. As the Court previously observed in this case, the proceedings of a foreign jurisdiction have limited relevance to the adjudication of patent rights in the United States courts. (Court Tr. 1027-1028); *see e.g.* Medtronic, Inc. v. Daig Corp., 789 F.2d 903, 908 (Fed.Cir.1986) (holding that German tribunal's decision is not binding on patent determination by United States federal court); Heineken Technical Services, B.V. v. Darby, 103 F.Supp.2d 476 (D.Mass.2000) (collecting cases).

To the extent that the Sony Defendants allege that Bayer made inappropriate discovery requests and violated the protective order, the Court disagrees. The Sony Defendants have not identified any specific discovery requests which were improper and no sanctions were ordered against Bayer for their conduct during discovery. As for Bayer's alleged violation of the Court's protective order, the Court is likewise not persuaded that Bayer acted improperly. The Court is aware of only one prior allegation of a violation of the protective order. This alleged violation pertained to Bayer's reference to the Dowa/Sony indemnification agreement in its complaint against Dowa and Sony Japan. However, the evidence suggests that Bayer received the information regarding this indemnification agreement through nonconfidential letters sent by SEL and Dowa to Bayer early in the SEL suit and prior to the entry of any protective order in this case. Indeed, as Magistrate Judge Thynge noted in considering this allegation, "Dowa's the one who told them there was an indemnification agreement out there, Dowa. Which says to me now that Dowa, with SEL's permission, obviously essentially may have very well waived the confidentiality aspects of that indemnification agreement." (D.I. 213, Status Conf. 12/18/97 Tr. at 27). Accordingly, the Court concludes that the Sony Defendants have failed to establish that Bayer's conduct in initiating and prosecuting this lawsuit amounted to an abuse of process.

CONCLUSION

For the reasons discussed, the Court concludes that Bayer has failed to establish that the Sony Defendants infringed the '799 Patent, and therefore, the Court will enter judgment in favor of the Sony Defendants and against Bayer on Bayer's claims of infringement. In addition, the Court concludes that the Sony Defendants have established that the '799 Patent is invalid due to lack of enablement, and therefore the Court will enter judgment in favor of the Sony Defendants and against Bayer on the Sony Defendants' claim of invalidity. As for inequitable conduct, the Court concludes that the Sony Defendants have failed to establish that the '799 Patent is unenforceable due to inequitable conduct, and therefore, judgment will be entered in favor of Bayer and against the Sony Defendants on the Sony Defendants' claim of unenforceability. Lastly, the Court concludes that the Sony Defendants have not established that Bayer's pursuit of this litigation amounted to an abuse of process, and therefore, the Court will enter judgment in favor of Bayer and against the Sony Defendants on their claim of abuse of process.

An appropriate Order will be entered.

FINAL JUDGMENT ORDER

At Wilmington, this 4th day of November 2002, for the reasons set forth in the Memorandum Opinion issued this date;

IT IS HEREBY ORDERED that:

1. U.S. Patent No. 4,290,799 is invalid under 35 U.S.C. s. 112, for lack of enablement, and therefore Judgment is entered in favor of Defendants and against Plaintiff Bayer AG on Defendants' claim of invalidity.

2. If U.S. Patent No. 4,290,799 were valid, Defendant Sony Electronics, Inc. would not directly infringe Claims 1-3 of U.S. Patent No. 4,290,799, and therefore Judgment is entered in favor of Defendant Sony Electronics, Inc. and against Plaintiff Bayer AG on Plaintiff Bayer AG's claim of direct infringement.

3. If U.S. Patent No. 4,290,799 were valid, Defendants Sony Corporation, Inc. and Dowa Mining Co. would not induce infringement of Claims 1-3 of U.S. Patent No. 4,290,799, and therefore Judgment is entered in favor of Defendants Sony Corporation Inc. and Dowa Mining Co. and against Plaintiff Bayer AG on Plaintiff Bayer AG's claim of inducement of infringement.

4. United States Patent No. 4,290,799 is not unenforceable due to inequitable conduct, and therefore, Judgment is entered against Defendants and in favor of Plaintiff Bayer AG on Defendants' claim of unenforceability.

5. Plaintiff Bayer AG is not liable for abuse of process, and therefore, Judgment is entered in favor of Plaintiff Bayer AG and against Defendants on Defendants' claim of abuse of process.