

Intellectual Property

Patent Law

Best Mode

Patent Lesson: If You Have a Best Mode – Disclose It



Contributed by Robert H. Resis,
Banner & Witcoff, Ltd.

There are two primary ways to protect proprietary technology – patents and trade secrets. Trying to patent a technological advancement while keeping another technological advancement as a trade secret can lead to the loss of both patent and trade secret protection. This was the outcome in a recent lawsuit between Wellman, Inc. and Eastman Chemical Company.¹

Investment and Technological Success

Wellman had two patents that were involved in the lawsuit. The Wellman patents² disclose polyethylene terephthalate (“PET”) resins for use in plastic beverage containers.³ The patents state that older (“prior art”) PET resins produced bottles that shrank or grew hazy.⁴ This was said to result from crystallization when

bottles were “hot-filled” with product at temperatures of between about 180 and 205 degrees Celsius.⁵

To overcome these problems, Wellman spent millions of dollars and thousands of hours developing “slow-crystallizing” PET resins.⁶ An inventor, Dr. Steven Nichols, declared that the inventors “unlocked in . . . research . . . the secret to making an effective slow-crystallizing bottle resin by understanding the proper balance of the parameters of catalyst concentration, co-monomer concentration, intrinsic viscosity, and heat-up-rate [HUR] additive in order to make high clarity bottles.”⁷

The Wellman patents were directed to these “slow crystallizing” PET resins.⁸ The Wellman patents defined “slow-crystallizing” PET resins as those possessing a significantly higher heating crystallization exotherm peak temperature as compared to conventional PET resins.⁹ The new resins purportedly retained exceptional clarity by delaying the onset of crystallization relative to conventional PET resins.¹⁰ Conventional resins used the metallic element antimony as a catalyst.¹¹

Commercial Embodiment Was Not Disclosed in the Patent Applications

By the time Wellman filed a patent application in May 2004, which led to the ‘317 patent, Wellman had commercialized a slow-crystallizing, hot-filled PET resin called Ti818.¹² Wellman did not, however, disclose the recipe for Ti818 in its patents, nor did Wellman disclose any other specific PET resin recipes.¹³ Instead, Wellman provided ranges of concentrations for categorized lists of possible ingredients.¹⁴ The following table provides a comparison of pertinent parameters between Wellman’s Ti818 resin and the disclosure in the Wellman patents.

Table – Comparison of Pertinent Parameters Between Wellman’s Ti818 Resin and the Disclosure in the Wellman Patents¹⁵

Originally published by Bloomberg Finance L.P. in the Vol. 5, No. 36 edition of the Bloomberg Law Reports–Intellectual Property. Reprinted with permission. Bloomberg Law Reports® is a registered trademark and service mark of Bloomberg Finance L.P.

This document and any discussions set forth herein are for informational purposes only, and should not be construed as legal advice, which has to be addressed to particular facts and circumstances involved in any given situation. Review or use of the document and any discussions does not create an attorney-client relationship with the author or publisher. To the extent that this document may contain suggested provisions, they will require modification to suit a particular transaction, jurisdiction or situation. Please consult with an attorney with the appropriate level of experience if you have any questions. Any tax information contained in the document or discussions is not intended to be used, and cannot be used, for purposes of avoiding penalties imposed under the United States Internal Revenue Code. Any opinions expressed are those of the author. Bloomberg Finance L.P. and its affiliated entities do not take responsibility for the content in this document or discussions and do not make any representation or warranty as to their completeness or accuracy.

Parameter	Amount in Wellman's Commercial Product (Ti818)	Disclosure in the Wellman patents
Isophthalic Acid	1.4 mol %	1.6-2.4 mol %
Diethylene Glycol	1.9 mol %	1.6 mol %
Heat-up rate ("HUR") additive	7.5 ppm of carbon-black HUR additive N990, having a 290 nm particle size	Optional HUR additives improve resin reheating profile during blow molding; "natural spinels and synthetic spinels" are the "most preferred" HUR additives. Copper and chromite black spinel and chrome iron nickel black spinel are characterized as "[p]articularly outstanding spinel pigments." Carbon-based HUR additives are described as "one embodiment" of the invention. "Suitable" carbon-based additives include carbon black. U.S. Patent No. 4,408,004 ("Pengilly") discloses a preferred average particle size for carbon black in a range of between about 15 to about 30 nm.

The Patent Infringement Lawsuit

Wellman sued Eastman for patent infringement. After trial, the case went to appeal before the U.S. Court of Appeals for the Federal Circuit, which hears all patent appeals.

The Federal Circuit affirmed judgment against Wellman, concluding that the patents' descriptions (their "specifications") did not disclose the "best mode" of carrying out the invention.¹⁶ Further, since the "best mode" was publicly disclosed during the course of the litigation, any trade secret Wellman sought to conceal was no longer a secret.

Patent Law Requires Each Inventor to Disclose Their Best Mode

As highlighted by the following discussion of the case report, when obtaining a patent, it is important to determine at the time of filing the patent application with the Patent Office whether **any** inventor has a "best mode" of practicing the claimed invention. If any inventor has a best mode, that best mode needs to be disclosed in the patent application. The patent laws state that a patent specification "shall set forth the best mode contemplated by the inventor of carrying out his invention."¹⁷ Failure to disclose the best mode can result in a judgment that the asserted patent claims are invalid, as in the *Wellman* case.

The Federal Circuit used a two prong analysis of the best mode issue.¹⁸ The court addressed first whether, at the time of patent filing, at least one inventor had a best mode of practicing the claimed invention,¹⁹ and second, whether there was a concealment of the best mode from the public.²⁰

The Federal Circuit stated that the first prong of the best mode inquiry is "subjective, focusing on the inventor's personal preferences as of the application's filing date."²¹

At Least One Inventor Had a Best Mode at the Time of Patent Filing

The Federal Circuit found that there was no genuine dispute that at least one inventor (Dr. Nichols) "subjectively believed that Ti818—which contained carbon black N990 as a heat-up rate ("HUR") additive—was the best resin available for hot-fill packaging at the time of filing the applications for the Wellman patents."²² Specifically, Nichols testified that at the time of filing, his preferred PET recipe was "the first run of the product that we called Ti818 which was done at our Pearl River plant in the fall of 2003."²³ Nichols also admitted that, before filing, he believed there was no PET recipe better than the Ti818 recipe of 2003.²⁴ Another inventor (Dr. Moore) also apparently believed that Ti818 was the preferred PET resin.²⁵ Although Moore "did not refer to Ti818 by name, he testified that as of the filing date of the '317 patent, the best way of making PET in the research laboratory to achieve the claimed TCH, absorbance, and luminosity values used a combination of titanium catalysts, cobalt, and carbon black as the HUR additive" (TCH being the temperature at which the sample crystallizes the fastest during heating in a differential scanning calorimetry machine).²⁶ Ti818 contained each of these ingredients.²⁷

The Federal Circuit found that Wellman's declarations indicated that in 2004, prior to filing for the patents, the concentration of carbon black was reduced (but not eliminated), and a branching agent included, purportedly to accommodate specific customer requirements.²⁸ The court held, however, that having subtle changes in a recipe "to accommodate specific customer demands does not excuse the applicant's obligation to disclose what [the inventors] contemplated was the best mode of practicing the invention at the time of filing."²⁹

The Federal Circuit also found that “[t]here was no genuine dispute that at least one inventor subjectively believed that the specific HUR additive used in Ti818, carbon black with a 290 nm particle size, was essential.”³⁰ After testing a variety of HUR additives in October 2002, an inventor (Thompson) wrote that “carbon black with a 290 nm particle size had *clearly the best reheat rate*.” (emphasis added).³¹ Thompson characterized carbon black with a 290 nm particle size as an “invention,” and characterized the other tested HURs as “prior art.”³² Further, a table comparing tests on various HUR additives stated that “7.5 ppm code 5056” is the “*HUR Needed for hotfill*,” while the spinel Cr2O3 is described as “Green.” (emphasis added).³³ Wellman’s internal name for carbon black with a 290 nm particle size was “code 5056,” indicating a clear preference for this HUR.³⁴ The Federal Circuit further noted that inventor Moore “forwarded this table to Wellman’s patent counsel less than two months before Wellman filed the application leading to the ’317 patent.”³⁵

Inventors’ Company Wanted to Keep Commercial Embodiment a Trade Secret

The Federal Circuit found that Wellman did not disclose carbon black N990 in its patent applications, and instead, chose to protect this ingredient of Ti818 as a trade secret.³⁶ The court found the following testimony of inventor Thompson to be particularly insightful:

Q. Was Wellman trying to keep N990 as a trade secret?

...

A. Yes.

...

Q. And were you instructed by anybody at Wellman on maintaining the trade secret nature of N990?

A. Yes.

Q. Who?

A. Mr. Bruening [Thompson’s boss].³⁷

The Federal Circuit noted that “Bruening acknowledged that he instructed his department to maintain N990 as a trade secret.”³⁸ Furthermore, “Wellman continued to protect the use of N990 in its PET resin products as a trade secret from its discovery in 2002 through February of 2010.”³⁹ In fact, Wellman requested that the trial court seal the courtroom during the arguments on judgment “expressly to maintain the confidentiality of N990.”⁴⁰

The Patents Did Not Disclose a Best Mode of Any Inventor

The Federal Circuit noted that one inventor (Dr. Moore) “testified that as of the filing date of the ’317 patent, he preferred using carbon black as the best way of making PET to achieve the claimed TCH, absorbance, and luminosity values.”⁴¹ The Federal Circuit stated that significantly, another inventor (Dr. Nichols) “also testified that a recipe containing carbon black was his preferred PET resin prior to patent filing.”⁴² The court found that “no inventor identified a PET resin containing a spinel as a preferred embodiment of the invention,”⁴³ even though the patents stated that spinels were the “most preferred” HUR additives⁴⁴. The Federal Circuit further found that Wellman’s contemporaneous internal documents also undermined its arguments that a spinel was a preferred embodiment, as they praised carbon black N990 as “clearly the best” and as the HUR “[n]eeded for hotfill,” and no contemporaneous document in the record similarly praised spinels.⁴⁵

“Wellman’s patent attorney testified that Wellman would have revised its commercial PET resins to include spinels instead of carbon black N990, but for concerns over a third-party patent.”⁴⁶ The Federal Circuit stated that a party’s failure to disclose its commercial mode does not necessarily result in a violation of the patent law “because the focus of a best mode inquiry remains on the claimed invention rather than the marketed product.”⁴⁷ The court found, however, that Wellman conceded “that its commercial Ti818 PET resin [was] within the scope of the [patent] claims invalidated by the [trial] court.”⁴⁸ Based on the totality of the evidence, the Federal Circuit concluded that “Ti818 and its HUR additive carbon black N990 were considered the best mode of practicing the invention by one or more inventors at the date of filing.”⁴⁹

The Best Mode Was Intentionally Concealed from the Public

The Federal Circuit went on to “determine whether there was any issue of material fact concerning concealment of the best mode from the public, the second prong of the best mode inquiry.”⁵⁰ The court noted that “an inventor may represent his contemplated best mode just as well by a preferred range of conditions as by a working example.”⁵¹ In *Wellman*, however, “some of the ingredients for Ti818, namely isophthalic acid and diethylene glycol, fall *outside* of the disclosed preferred ranges and therefore lead away from the Ti818 recipe.”⁵²

Moreover, the Federal Circuit held that “[t]he Wellman patents lead away from the use of carbon black N990 in Ti818” – *i.e.*, “the patents characterize carbon black merely as a ‘suitable’ HUR additive without any discussion of particle sizes.”⁵³ Specifically, “[t]he Pengilly patent, the sole source of carbon black HUR additives identified in the Wellman patents, states that carbon black HUR additives have ‘typical’ particle sizes ‘from 10 to 100

nm' and 'preferred' average particle sizes from 'about 15 to about 30 [nm],'" while "[c]arbon black N990 has a particle size of 290 nm."⁵⁴

The Federal Circuit stated that "there is no requirement under 35 U.S.C. § 112 ¶ 1 to identify which disclosed mode is the best mode."⁵⁵ It also noted that the "best mode may be represented by a preferred range of conditions or group of ingredients."⁵⁶ The court concluded, however, that "Wellman concealed the best mode by not disclosing the recipe for Ti818, by identifying preferred concentration ranges for certain ingredients that excluded those used in Ti818, and by identifying preferred particles sizes for the HUR additive other than that used in Ti818."⁵⁷

As part of the second prong, the Federal Circuit examined Wellman's disclosure "to discern whether it enabled a person of skill in the art to practice the best mode without undue experimentation."⁵⁸ This, the court stated, was an objective inquiry focused on the scope of the claimed invention and the level of skill in the ordinary art.⁵⁹ Another inventor (Dr. Schiavone) "admitted he could not derive the recipe for Ti818 from the disclosure in the Wellman patents."⁶⁰ Inventor Nichols testified that "a series of design experiments could be developed to identify a resin meeting the claimed limitations, but did not state that those experiments would yield Ti818."⁶¹ The Federal Circuit noted that "[e]ven where there is a general reference to practicing the claimed invention, the quality of the disclosure may be so poor as to effectively conceal it."⁶²

The Federal Circuit held that "[b]y masking what at least one inventor considered the best of these slow-crystallizing resins, Wellman effectively concealed its recipe for Ti818."⁶³ The court held that "Wellman had an obligation to adequately disclose the best mode of practicing its 'unlocked secret' under the best mode requirement, yet did not do so."⁶⁴

The Federal Circuit concluded that Wellman intentionally concealed the best mode.⁶⁵ Specifically, "[a]s shown by the testimony of Thompson and Bruening, Wellman intended to conceal carbon black N990, an ingredient in Ti818, by choosing to maintain it as a trade secret."⁶⁶ As the trial court correctly stated, this choice did not "excuse Wellman's compliance with the best mode requirement."⁶⁷ Accordingly, the Federal Circuit affirmed the invalidity of the asserted Wellman patent claims, to the extent they were at issue in the lawsuit, for failure to comply with the best mode requirement.⁶⁸

Patent Owner Lost Both Patent and Trade Secret Protection

Wellman tried to achieve patent protection while at the same time trying to keep an inventor's best mode of practicing the claimed invention a trade secret. But Wellman wound up with invalid patents, and also suffered from public disclosure of its trade secrets during the course of the patent lawsuit.

In sum, careful consideration should be made before filing a patent application of whether any inventor has a best mode of practicing the claimed invention. If any inventor does have such a best mode, that best mode should be disclosed in the patent application. Trying to patent a technological advancement, like Wellman's invention of slow crystallizing PET resins, while trying to keep as a trade secret another technological advancement, like Wellman's use of carbon black N990, can lead to the loss of both patent and trade secret protection.

Robert H. Resis is a shareholder at Banner & Witcoff and can be reached at rresis@bannerwitcoff.com. Mr. Resis handles litigation, counseling and prosecution matters.

This article is for educational and informational purposes only and should not be construed in any way as legal advice. The article reflects the opinion of the author and should not be attributed to the firm Banner & Witcoff or to any of its clients.

¹ *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355 (Fed. Cir. 2011).

² U.S. Patent Nos. 7,094,863 and 7,129,317 (the '317 patent).

³ *Wellman, Inc.*, 642 F.3d at 1357.

⁴ *Id.*

⁵ *Id.*

⁶ *Id.* at 1365.

⁷ *Id.*

⁸ *Id.* at 1357.

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at 1358.

¹⁴ *Id.*

¹⁵ *Id.* at 1358.

¹⁶ *Id.* at 1365.

¹⁷ 35 U.S.C. § 112 (2006).

¹⁸ *Wellman*, 642 F.3d at 1360.

¹⁹ *Id.* at 1361–64.

²⁰ *Id.* at 1364–65.

²¹ *Id.* at 1360 (citing *N. Telecom Ltd. V. Samsung Elecs. Co.*, 215 F.3d 1281, 1286 (Fed. Cir. 2000)).

²² *Id.* at 1361.

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.* at 1361.

²⁹ *Id.* at 1362.

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

³⁸ *Id.*

³⁹ *Id.* at 1362–63.

⁴⁰ *Id.* at 1363.

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.* at 1363.

⁴⁴ *Id.* at 1357.

⁴⁵ *Id.*

⁴⁶ *Id.* at 1364.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.* (citing *In re Honn*, 364 F.2d 454, 462 (C.C.P.A. 1966)).

⁵² *Id.* (emphasis by the Federal Circuit).

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.* (citing *In re Bosy*, 360 F.2d 972, 976 (C.C.P.A. 1962)).

⁵⁶ *Id.* (citing *In re Honn*, 364 F.2d 454, 462 (C.C.P.A. 1966)).

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.* at 1360.

⁶⁰ *Id.* at 1364.

⁶¹ *Id.* at 1365.

⁶² *Id.* (citing *Transco Prods., Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 560 (Fed. Cir. 1994)).

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*