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Redefining Boundaries: How *Cohesive Technologies* Altered Literal and Equivalent Infringement

I. INTRODUCTION

“The difficulty of literature is not to write, but to write what you mean.”¹ The human story is replete with instances where, due to its inherent limitations, language has failed to perfectly communicate an abstract idea.² Patent drafting, with its objective to reduce an abstract and complex inventive concept to text while at the same time providing an adequate level of public notice of what is protected, is not immune from these limitations.³ In light of the impossibility of written text achieving perfect protection *and* perfect notice to the public of what is protected by the patent, the most one can hope for is reasonable protection and reasonable notice. The patent drafter must strike a delicate balance between protection of the inventor’s concept and sufficient public notice of what is protected.

A simple example illustrates the problem. A hypothetical patent describes and claims the joining of two metal plates with a bolt. A competitor sells two metal plates joined with a rivet. In an infringement action, two different philosophies produce two different interpretations of the scope of the patent. Under a protectionist philosophy, the riveted plates infringe the patent because using a rivet in lieu of a bolt is a trivial and insignificant change to the substantive patented concept of joining two metal plates. This interpretation, while affording greater protection to the inventor, sacrifices clear public notice of what the patent covers by extending the scope of the patent beyond its literal terms. The disclosure in the patent was arguably not clear because it did not indicate to the

1. ROBERT LOUIS STEVENSON, *Truth of Intercourse*, in THE BIOGRAPHICAL EDITION OF THE WORKS OF ROBERT LOUIS STEVENSON: VIRGINIBUS PUERISQUE AND OTHER PAPERS 61, 63 (1911).

2. One need not look past one’s own person to illustrate the oft-experienced limitations of written language. Popular phrases such as “Words can’t describe,” “I don’t know what to say,” “I’m speechless,” and “What do you mean?” are used on a daily basis and evidence the well-recognized inability of language to communicate ideas and emotions.

3. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002) (“[T]he nature of language makes it impossible to capture the essence of a thing in a patent application.”); *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967); Robert Unikel & Douglas Eveleigh, *Protecting Inventors, Not Fortune Tellers: The Available Patent Protection for After-Developed Technologies*, 34 AIPLA Q.J. 81, 143–44 (2006) (discussing dual role of patent law).

public what constituted infringement. Under a disclosure philosophy, however, the riveted plates do not infringe the patent because they do not use a bolt, as is expressly disclosed and claimed in the patent. While under this philosophy the scope of the patent is clearly set forth to the public, it may not completely protect the inventive concept of the patent of joining two plates of metal.⁴ A significant body of case law has developed to strike a balance between these two adverse philosophies.⁵ The doctrine of equivalents and its limitations try to strike this balance by permitting an “equivalent” device to infringe under certain circumstances when literal terms of the patent are not met.⁶ Ideally, when a battle between disclosure and protection necessitates such a balance, the interpretation of what is a reasonable disclosure and what is reasonable protection is left to those most qualified in the field.⁷

The Court of Appeals for the Federal Circuit in *Cohesive Technologies, Inc. v. Waters Corp.* significantly altered that case law-established balance when it relied on its own interpretation of the phrase “about 30 μm ,” rather than leaving that interpretation to a qualified expert.⁸ In so doing, the court not only altered the well-established equivalent infringement analysis, but unnecessarily obscured the boundary between the analyses of equivalent infringement and literal infringement. As a result of this process, a patent loses its ability to fulfill its purpose to “promote the Progress of Science and useful Arts.”⁹ This Note engages in an analysis of the effects of the *Cohesive* decision on the existing area of patent practice.

Part II of this Note briefly describes the purpose and history of equivalent infringement and its relation to literal infringement. Part III discusses the Federal Circuit’s treatment of *Cohesive*, highlighting how

4. Judge Learned Hand described that, in part, the doctrine of equivalents is provided “in misericordiam to relieve those who have failed to express their complete meaning.” *Claude Neon Lights, Inc. v. E. Machlett & Son*, 36 F.2d 574, 576 (2d Cir. 1929).

5. See generally *Festo Corp.*, 525 U.S. 722 (indicating the difficulty in determining what is equivalent); *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997) (clarifying the confusion inherent in the doctrine of equivalents); *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605 (1950) (determining when a device infringes upon a valid patent).

6. See *Warner-Jenkinson*, 520 U.S. at 21. For a more complete treatment of what constitutes an “equivalent,” see *infra* Part II.B.2.

7. See *Warner-Jenkinson*, 520 U.S. at 25 (stating the importance of the opinion of one having reasonable skill in the art in determining equivalence).

8. 543 F.3d 1351 (Fed. Cir. 2008). When a decision is put before a jury, more extrinsic evidence is considered, including but not limited to expert testimony. With more evidence a greater likelihood exists that a more correct interpretation is reached.

9. U.S. CONST. art. I, § 8, cl. 8.

the court oversimplified the necessary analysis, disregarded its own legal ideology, and upset the historical balance between disclosure and protection. Part IV discusses the implications of the *Cohesive* decision on the future of patent law. Part V hypothesizes how *Cohesive* should have been decided by introducing a proposed simplified method. Part VI then summarizes this Note.

II. STATE OF THE LAW

A. *Development of the Doctrine of Equivalents*

The constitutional purpose of a patent is “[t]o promote the Progress of Science and useful Arts.”¹⁰ This is carried out by incentivizing inventive development by “securing for limited Times to Authors and Inventors the exclusive right to their respective Writings and Discoveries.”¹¹ With the promise of exclusivity, it becomes imperative to determine the actual scope of the invention, so that it can be adequately protected; hence the need for the doctrine of equivalents to aid in determining that scope.

Although a means to achieve the constitutional purpose of the patent “[t]o promote the Progress of Science and useful Arts”¹² is through exclusivity, the efficiency with which this goal is achieved is a function of how accurately an invention is claimed and disclosed to the public.¹³ A clearly defined scope of the patent allows potential developers (inventors, investors, businesses, etc.) to engage in competitive and developmental practices that will further “promote the Progress of Science and the useful Arts.”¹⁴ Without any sort of limitation on the doctrine of equivalents, these practices would be severely frustrated as a crafty patent drafter, through the use of cleverly chosen relative terms, could obtain patent protection greater than what was actually invented.¹⁵ To combat such a situation, Congress enacted 35 U.S.C. § 112 as part of the Patent Act of 1952,¹⁶ which set forth what is known as “the

10. *Id.*

11. *Id.*

12. *Id.*

13. Werner Stemer, *The Doctrine of Equivalents after Hilton Davis and Markman, and a Proposal for Further Clarification*, 22 NOVA L. REV. 783, 794 (1998) (“[P]atents . . . provide notice to the public as to what is and what is not available for general use.”).

14. U.S. CONST. art. I, § 8, cl. 8.

15. Timothy R. Holbrook, *Equivalency and Patent Law’s Possession Paradox*, 23 HARV. J.L. & TECH. 1, 6 (2009).

16. Harold C. Wegner, *The Disclosure Requirements of the 1952 Patent Act: Looking Back*

enablement requirement.”¹⁷ Section 112 requires that a valid patent must “descri[be] . . . the invention, . . . 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 . . . to make and use the same.”¹⁸ Requiring definite language effectively limits the crafty patent drafter in his overreaching endeavors. Equally as important as defining what has been invented, this enablement requirement creates an inherent disclosure of what has *not* been invented. By clearly defining a new endeavor, the enablement requirement provides an opportunity for potential developers to evaluate and pursue unprotected technological developments. This clearly fulfills the constitutional goals of patent law to “promote the Progress of Science and useful Arts.”¹⁹ However, the enablement requirement and the constitutional grant of protective rights introduce the timeless struggle to balance two opposing interests—the inventor desiring broad interpretation, which affords him maximum protection, and the public desiring a well-defined interpretation, which affords a clear boundary of infringement.

Although Congress has required definiteness in drafting patents, often words do not adequately describe the invention. This staunch enablement requirement, while precluding over-expansive drafting, allows crafty drafters to exploit the patented invention by making trivial, insignificant changes to the claimed invention to avoid infringement.²⁰ The judicially established “doctrine of equivalents” recognizes and seeks to remedy the difficulty by extending patent protection beyond the literal terms of a patent to more fully cover the inventive concept.²¹ The doctrine of equivalents states that “a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of

and a New Statute for the Next Fifty Years, 37 AKRON L. REV. 243, 243 (2004).

17. ALZA Corp. v. Andrx Pharms., LLC, 603 F.3d 935, 949 (Fed. Cir. 2010).

18. 35 U.S.C. § 112 (2006).

19. U.S. CONST. art. I, § 8, cl. 8; see Holbrook, *supra* note 15, at 35 (describing how patent holders can gain patent protection beyond what they invented).

20. Holbrook, *supra* note 15, at 35.

21. *Id.* at 5 (declaring the doctrine of equivalents to be a judicially-created doctrine); see also Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 78 (2004) (“In addition, the doctrine of equivalents exists to prevent a patent owner from losing effective protection because she did not draft claims that effectively cover what she invented.” (citing *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608–09 (1950))).

the patented invention.”²² Thus, a patent owner, by showing equivalence between the patented invention and the accused infringing device, can exercise his statutory right to exclude others from making or using his invention.

To fulfill its constitutional purpose, a patent needs both the doctrine of equivalents and the enablement requirement: the doctrine of equivalents to protect the inventor and incentivize invention and the enablement requirement to apprise potential developers of the bounds of their development. At its most basic level, the doctrine of equivalents is one of fairness, requiring disclosure sufficient to inform the public of the protected invention while maintaining adequate protection and sufficient incentives for the inventor.²³

B. Mechanics of the Doctrine of Equivalents

Just as it is difficult to balance the need for definiteness with the understanding that the invention is more of an idea rather than words, it is likewise difficult to determine if another patent is effectively equivalent. Therefore, after a patent owner has brought an infringement suit against an alleged infringer, a determination of what is equivalent must be made. This may be done through the use of extrinsic evidence or, as in the case of *Cohesive*, by the court’s own interpretation.²⁴

1. Procedural chronology

While the doctrine of equivalents is available to a patent owner for the protection of his invention, there exists an analytical prerequisite of no infringement upon the literal terms before a patent owner can claim infringement by an equivalent.²⁵ The determination of literal infringement is fairly straightforward. First, the governing body looks at the express terms of the patent.²⁶ If the accused device is defined by those express claims, then the accused device infringes the claimed patent and the analysis is complete.²⁷ Only if the accused device is

22. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 21 (1997) (citing *Graver Tank*, 339 U.S. at 609).

23. Holbrook, *supra* note 15, at 14.

24. Cohesive Techs., Inc. v. Waters Corp., 543 F.3d 1351 (Fed. Cir. 2008).

25. Black & Decker, Inc. v. Hoover Serv. Ctr., 886 F.2d 1285, 1295 (Fed. Cir. 1989).

26. *Graver Tank*, 339 U.S. at 607.

27. *Id.*

determined not to infringe literally on the patent should the more extensive doctrine of equivalents be considered.²⁸

Fully considering equivalence only after a finding of no literal infringement obviates a full doctrine of equivalents analysis in many infringement actions. Not every case that is brought before the judiciary requires an extensive analysis.²⁹ Certain devices are so simple, comprised of only a few clear and simple claims, that determining whether they are infringed by an equivalent device is not only unnecessary but is actually burdensome to the judicial process. Conducting an extensive analysis for every case would overwhelm the judicial docket with extraneous expert testimony and analysis of the other elements required in a full doctrine of equivalents analysis.³⁰ By distinguishing literal infringement from equivalent infringement, the courts promote judicial economy.

An additional benefit to this bifurcation of infringement is the separation of the analysis techniques of literal infringement and equivalent infringement. This bifurcation shelters and preserves the more simple literal infringement analysis from infiltration by the more complete, time-intensive equivalent infringement analysis.³¹ Absent such bifurcation, elements of an equivalence analysis could leak into an analysis of a simple patent, thus unnecessarily complicating and prolonging the judicial process. By clearly delineating those cases that necessitate a more thorough equivalent-focused analysis, the court can maximize the efficiency of the judicial system by limiting a full equivalence analysis to those patents that require such a thorough analysis.³² By so limiting the application of the doctrine of equivalents, the court also ensures that those patents that only necessitate a simple analysis are quickly processed and issued as patents.

28. *Black & Decker*, 886 F.2d at 1295.

29. *See, e.g.*, *Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001); *Int'l Visual Corp. v. Crown Metal Mfg. Co.*, 991 F.2d 768, 772 (Fed. Cir. 1993). In certain cases, not conducting a full doctrine of equivalents analysis is efficient because the doctrine of equivalents is sometimes unnecessary.

30. *See infra* Part II.B.2.

31. *See* *TypeRight Keyboard Corp. v. Microsoft Corp.*, No. 98-1358-IEG (LAB) 2002 U.S. Dist. LEXIS 27468, at *9 (S.D. Cal. Mar. 27, 2002) (recognizing that because the court did not engage in doctrine of equivalents analysis, their job was simpler with only literal infringement to consider).

32. *See* *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1378 (Fed. Cir. 2003) (citing *Lear Siegler, Inc. v. Sealy Mattress Co.*, 873 F.2d 1422, 1425 (Fed. Cir. 1989) (requiring separate and distinct analysis for equivalent infringement)).

2. Determining equivalence

Once a patent has been adjudged to necessitate a full doctrine of equivalents infringement analysis, it is extensively inspected to determine the scope of what the inventor actually invented. The difficulty of interpreting the patent requires that any interpretation be done by those most intimately familiar with the subject matter.³³ The foundation upon which any determination of equivalence is made, as stated in *Warner-Jenkinson*, is that “a product or process . . . may . . . infringe if there is ‘equivalence’ between the . . . accused product . . . and the claimed elements.”³⁴ From this foundation, many different tests have developed to assess when an accused device is in fact an equivalent.³⁵

a. Function-way-result. Under this test, an accused device infringes “if it performs substantially the same function in substantially the same way to obtain the same result” as the patented device.³⁶

b. Insubstantial differences. The insubstantial differences test considers whether the accused device has differences from the patented device that are not substantial to its function.³⁷

c. Interchangeability. The interchangeability test factors whether “persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was” in determining whether the accused device is an equivalent to the patented device.³⁸

33. *Aquatex Indus. v. Techniche Solutions*, 479 F.3d 1320, 1329 (Fed. Cir. 2007) (“[W]hen the patent holder relies on the doctrine of equivalents . . . the difficulties and complexities of the doctrine require that evidence be presented . . . through the . . . testimony of a person of ordinary skill in the art, typically a qualified expert.” (emphasis added)).

34. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997).

35. It is beyond the scope of this Note to offer a complete treatment of each of these methods, but it is sufficient to note the extensiveness of the analysis undertaken to interpret what constitutes an equivalent. For a more complete treatment of the different equivalence measurement criteria, see *id.*

36. *Mach. Co. v. Murphy*, 97 U.S. 120, 125 (1878).

37. *Warner-Jenkinson*, 520 U.S. at 40. While the court criticizes the usefulness of the insubstantial differences test, it at least recognizes its existence, which suits the scope of discussion in this Note.

38. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950).

d. Foreseeability. Under the foreseeability test one considers whether it would have been foreseeable to one having “ordinary skill in the art”³⁹ to alter the patented device to produce the accused infringing device.⁴⁰

e. Should have been in possession. Under this test, the doctrine of equivalents also provides protection if, at the time of the invention, the inventor should have been in possession of the equivalent.⁴¹

While the debate is lively over which definition of equivalence is correct, it is sufficient for the scope of this Note to conclude that an extensive analysis will be carried out when equivalence is questioned.

3. Infringement analysis

An understanding of the governing body conducting an infringement analysis is as important as understanding the analysis itself. While the determination of infringement by an expert in the field would be ideal, the current system for evaluating infringement allows for different decision makers. On the one hand, a matter may be classified as a question of law in the form of claim construction or a motion for summary judgment and therefore decided by a judge.⁴² On the other hand, infringement is traditionally a question of fact to be decided by a jury;⁴³ this includes a determination of equivalent infringement.⁴⁴ The jury’s analysis is often informed by expert witnesses and through other extrinsic evidence.⁴⁵ While judges are more skilled in the art of interpretation,⁴⁶ labeling the matter a question of law limits the scope of the record on which a decision may be based. Thus, allowing a jury to base its determination of infringement on the interpretations of experts who are intimately connected with the field results in a more accurate

39. See U.S. Pat. & Trademark Office, MANUAL OF PATENT EXAMINING PROCEDURE, § 2141.03 (8th ed., rev. 7, 2008).

40. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002); see also *Johnson & Johnston Assocs. Inc. v. R.E. Serv. Co.*, 285 F.3d 1046, 1056 (Fed. Cir. 2002) (Rader, J., concurring) (“[T]he doctrine of equivalents does not capture subject matter that the patent drafter reasonably could have foreseen during the application process and included in the claims.”).

41. *Holbrook*, *supra* note 15, at 14.

42. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388 (1996); see *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1359 (Fed. Cir. 2008).

43. *Markman*, 517 U.S. at 384.

44. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950).

45. *Id.*

46. *Markman*, 517 U.S. at 388.

determination of infringement than when a judge is left to define a term based on his or her legal, but not technical, expertise.⁴⁷

In summary, the doctrine of equivalents is a tool distinct from literal infringement that in certain cases puts decision-making power in the hands of a jury, who compile evidence from experts who are best equipped to apply complex patent claims.⁴⁸ By distinguishing between equivalent and literal infringement analyses, the court maximizes its time and conducts a full equivalence analysis only when cases so require.⁴⁹ While such an analysis can be complex, it ensures that a more application of the claim is reached. Thus, through the doctrine of equivalents, a proper balance between adequate disclosure and adequate protection is achieved while not overwhelming the judicial docket. However, this delicate balance has been threatened by the court's analysis in *Cohesive Technologies, Inc. v. Waters Corp.*

III. *COHESIVE TECHNOLOGIES V. WATERS CORP.*

A. Facts, Procedural Posture, and Holding

1. Facts of the case and district court proceedings

Beginning in 1998, Cohesive Technologies, Inc. asserted three separate causes of action against Waters Corporation for infringement of U.S. Patent Nos. 5,772,874 (the “874 patent”) and 5,919,368 (the “368 patent”), both of which were issued to Cohesive.⁵⁰ Both patents relate to high-performance liquid chromatography (“HPLC”).⁵¹ HPLC is a process for “separating, identifying, and measuring compounds contained in a liquid.”⁵² The process involves passing the liquid/compound mixture through a packed column of chromatographically active particles.⁵³ As the liquid passes through the

47. See Cheryl Lee Johnson, *The Continuing Inability of Judges to Pass Their Markman Tests: Why the Expanding Murkiness of the Task Leaves No Judge Behind*, in HOW TO PREPARE & CONDUCT MARKMAN HEARINGS 2007, at 907 (PLI Intellectual Prop., Course Handbook Ser. No. 675, 2007) for commentary on the increasing low quality of interpretation reached by judges during claim construction.

48. See *Cont'l Oil Co. v. Cole*, 634 F.2d 188 (5th Cir. 1981).

49. See *Black & Decker, Inc. v. Hoover Serv. Ctr.*, 886 F.2d 1285, 1295 (Fed. Cir. 1989).

50. *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1357 (Fed. Cir. 2008).

51. *Id.*

52. *Id.* at 1357–58.

53. *Id.* at 1358.

columns, the compound is extracted or measured.⁵⁴ The effectiveness of these columns at separating the compounds from the liquid depends on several variables including the diameter of the particles in the columns.⁵⁵ The claim at issue describes the device as “a chromatographic body formed as a substantially uniformly distributed multiplicity of rigid, solid, porous particles with chromatographically active surfaces, said particles having average diameters of greater than *about 30 μm*.”⁵⁶

Cohesive asserted its first infringement action against Waters claiming Waters’ Oasis HPLC 30 μm columns infringed Cohesive’s ‘874 patent.⁵⁷ During the pendency of the first action, a divisional application claiming priority of the ‘874 patent issued as the ‘368 patent.⁵⁸ Cohesive asserted a second cause of action claiming that the same 30 μm columns of the Waters Oasis HPLC columns infringed the ‘368 patent.⁵⁹ During the proceedings, Waters discontinued use of the 30 μm columns and began using replacement 25 μm columns.⁶⁰ Cohesive then asserted its third cause of action, claiming that these replacement 25 μm columns infringed both patents.⁶¹ With regards to the third cause of action, the district court granted summary judgment of noninfringement in favor of Waters. The court found that neither the ‘874 patent nor the ‘368 patent was infringed, either literally or by an equivalent device.⁶² Cohesive challenged the district court’s construction of the phrase “about 30 μm.”⁶³ It is the Federal Circuit’s interpretation of “about 30 μm” on appeal that highlights the importance of proper equivalence interpretation.

2. Court of appeals’ holding and rationale

a. Claim construction. The Court of Appeals first engaged in the difficult task of interpreting the phrase “about 30 μm” by determining the purpose of the size limitation.⁶⁴ The court relied on the specification

54. *Id.*

55. *Id.*

56. *Id.* (emphasis added).

57. *Id.*

58. *Id.*

59. *Id.*

60. *Id.* at 1359.

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.* at 1368 (“[T]he word ‘about’ does not have a universal meaning in patent claims, and [its] meaning depends on the technological facts of the particular case.” (quoting *Pall Corp. v.*

indicating that the purpose of this limitation is to achieve high speed flow and corresponding turbulence.⁶⁵

The court then focused on two assertions from the specification to determine what range of diameters was covered by the “about 30 μm ” claim language. In describing the porosity of the columns, the specification stated:

To measure porosity, a number of batches of particles were examined, the first being a batch (designated herein as CT-50A1-002) of uncoated, unfunctionalized highly irregularly shaped, porous alumina particles having a nominal diameter of 50 [μm], but an actual mean diameter, as determined by Coulter analysis, of 42.39 [μm] within a 95% confidence factor.⁶⁶

Based on this statement, the court concluded that the specification treats an average diameter of 42.39 μm as an average diameter of about 50 μm , noting this represents an acceptable variance of at least 15.22%.⁶⁷ The court then extrapolated that a similar variance was acceptable with regards to the 30 μm columns, concluding that “about 30 μm ” should encompass at least between 25.434 μm and 34.566 μm .⁶⁸

Second, the court relied on the specification claiming that particles with a nominal diameter of 20 μm did not attain the desired turbulence.⁶⁹ The court then extrapolated the same 15.22% variance as a limit of “about 20 μm ” to conclude that particles having actual diameters between 16.956 μm and 23.044 μm were not within the acceptable range of column diameters.⁷⁰ This left a range between the upper limit diameter of 15.22% of 20 μm (23.044 μm) and the lower limit diameter of 15.22% of 30 μm (25.434 μm) for which the court could not interpret whether or not a diameter was “about 30 μm .”⁷¹ The court concluded

Micron Separations, Inc., 66 F.3d 1211, 1217 (Fed. Cir. 1995)). The court also stated that “[i]n determining how far beyond the claimed range the term ‘about’ extends the claim, ‘[w]e must focus . . . on the criticality of the [numerical limitation] to the invention.’” (quoting *Ortho-McNeil Pharm., Inc. v. Caraco Pharm. Labs., Ltd.*, 476 F.3d 1321, 1327 (Fed. Cir. 2007)). *Id.*

65. *Id.*

66. *Id.* at 1369.

67. *Id.*

68. *Id.* at 1369–70.

69. *Id.* at 1369.

70. *Id.*

71. *Id.* at 1370. The range not accounted for is that between the lower limit of the 15.22% variance of 30 μm , 25.434 μm , and the upper limit of the 15.22% variance of 20, 23.044 μm .

that any value within this remaining range that could achieve turbulence fell under the phrase “about 30 μm .”⁷²

The combination of these two interpretations founded the court’s final definition that “about 30 μm ” is “either (1) greater than 25.434 μm (the lower limit of the 15.22% variance for 30 μm), or (2) both greater than 23.044 μm (the upper limit of the 15.22% variance for 20 μm) and of sufficiently large size to assure that the column is capable of attaining turbulence.”

b. Literal infringement. With the interpretation now set, the court moved on to its analysis of literal infringement. Assuming the facts in a light most favorable to the accused infringer (i.e. taking the average diameters of the accused 25 μm columns to be 25.16 μm ⁷³), the court found that the accused particles were not “about 30 μm ” and concluded that whether or not the columns were able to attain turbulence was a question of fact.⁷⁴ Therefore, the court held that the district court was incorrect to grant summary judgment on the literal infringement claim.⁷⁵

c. Equivalent infringement. The court then addressed the scope of the patent based on the doctrine of equivalents. The court used the function-way-result test in determining what diameters were disclosed by the “about 30 μm ” language.⁷⁶ Based on this construction, and the fact that the term “about” was expressly used in the claim, the court of appeals held that the doctrine of equivalents was not available to the patentee.⁷⁷ The court justified this, stating that the patentee, by expressly including the term “about” in the claims, had covered the same “range of novelty”⁷⁸ usually covered by the doctrine of equivalents and could not receive patent protection for “equivalents of equivalents.”⁷⁹ Thus, the court affirmed the district court’s finding of no equivalent infringement and upheld the grant of summary judgment of no infringement under the doctrine of equivalents.⁸⁰

72. *Id.*

73. *Id.* at 1367. Cohesive claimed that the actual average diameter of the 25 μm columns was 29.01 μm .

74. *Id.* at 1371.

75. *Id.*

76. *Id.* at 1372.

77. *Id.*

78. *Id.* (internal quotation marks omitted).

79. *Id.*

80. *Id.*

B. Analysis of Cohesive's Holding and Rationale

With the historic relationship between literal infringement and equivalent infringement so convoluted, the Court of Appeals had a striking opportunity to clarify and solidify this relationship. Instead, the Court of Appeals confused and weakened this relationship by conducting an inappropriate, oversimplified literal infringement analysis, altering the breadth of equivalent infringement (even against its own condemnation of doing so) and shifting the established balance between protection and disclosure.

1. The District Court's oversimplified analysis

As stated above, the purpose of the doctrine of equivalents is “to allow a finding of infringement where the accused product does not literally meet every limitation of a patent claim but does contain the legal equivalent thereof.”⁸¹ To determine whether a patent infringes under the doctrine of equivalents, the terms of the patent must be analyzed to determine the scope of the patent. The *Cohesive* court, by allowing the term “about” to fall within the realm of literal infringement, did not conduct sufficient analysis to interpret the scope of the patent.

Generally, the ambiguity that compels the doctrine of equivalents is created by a complete absence of a term that properly defines the scope of the patent.⁸² However, relative terminology such as “about” no more adequately describes the bounds of an invention than does a complete omission of the term altogether and therefore likewise justifies a full equivalence analysis. The *Cohesive* court itself conceded this when, in interpreting the scope of the term “about,” it used the function-way-result test that is normally reserved for a doctrine of equivalents analysis.⁸³ However, even though the court recognized that the term “about” was sufficiently ambiguous to justify an application of an equivalence test, the court still incorrectly categorized the patent term to fall under literal infringement and under-analyzed its scope.

By concluding that the “about 30 μm ” language should fall under literal infringement,⁸⁴ the court prevented the determination of a more accurate interpretation through a full doctrine of equivalents analysis.

81. *Xytec Plastics, Inc. v. Ropak Corp.*, No. 91-1206, 1992 U.S. App. LEXIS 260, at *2 (Fed. Cir. Jan. 8, 1992).

82. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 732 (2002).

83. *Cohesive*, 543 F.3d at 1372.

84. *Id.*

Instead, to determine what actual values fell within the “about 30 μm ” range, the court relied solely on two statements in the patent specification.⁸⁵ From these two statements alone, the court constructed the scope of “about 30 μm .”⁸⁶ There is no record of any outside consultation with those having ordinary skill in HPLC, no consideration of peer-reviewed literature, and nothing that resembles a doctrine of equivalents analysis that would verify that the court’s interpretation of “about” was in fact accurate. Additionally, in determining what “about” means statistically, the court equated the existence of differing particle diameters with their acceptability of being “about” a particular diameter, when there is no indication in the specification of any correlation between existence and acceptability.⁸⁷ Aside from the mere statement that the function-way-result test should be applied in this situation,⁸⁸ there was nothing that by any classification could be construed as an appropriately thorough investigation of the scope of “about” in the chromatography context.

The court’s finding not only altered the breadth and depth of the interpretive analysis but it also shifted the decision making authority.⁸⁹ By granting summary judgment, the court not only erred in oversimplifying the interpretive analysis, but it also erred by taking the decision out of the hands of the jury and consequently eliminating the assistance of those having ordinary skill in the art. The court thus bound Cohesive to the court’s interpretation, an interpretation that, given the lack of experience of the appellate judges in the specialized field of HPLC, may not have been accurate.

Take, for example, the determination of what constitutes an acceptable variance. The court reasoned that because a compound having a nominal diameter of 50 μm contained particles with an actual diameter of 42.39 μm , this variance of 15.22% must be acceptable and thus 42.39 μm was “about 50 μm .”⁹⁰ However, the mere existence of these particles

85. *Id.* at 1369. *See supra* Part III.A.2.a.

86. *Cohesive*, 543 F.3d at 1369.

87. *Id.*

88. *Id.* at 1372.

89. *Nystrom v. Trex Co.*, 580 F.3d 1281, 1287 (Fed. Cir. 2009). Judge Rader recognized the importance of this distinction, stating that “[a]lthough the tests are the same, the testers are different, which could produce different results in application of the same rules.” *Id.* While Judge Rader was discussing two distinct tests—the test for claim vitiation and the test under the doctrine of equivalents—the fact that these two tests are identical justifies the application of Judge Rader’s statement to a situation where two doctrine of equivalents tests are conducted by different testers.

90. *Cohesive*, 543 F.3d at 1369.

does not indicate acceptability, and no justification for such a conclusive correlation is found in the record. The court then extended this self-determined “acceptable” variance to different column sizes.⁹¹ Again, no justification for this conclusion is given. It may be the case that acceptable variances vary with the size of the nominal diameter.

The court’s accuracy in measurement also calls into question the sufficiency of its analysis. In calculating what the court determined to be an acceptable variance (and throughout the opinion), the court measured accuracy to five significant figures.⁹² As before, the record is empty of any justification for this degree of accuracy. The specification of the patent only used two significant figures,⁹³ which suggests that a level of accuracy of five significant figures is not the industry standard. Rather, it was the judiciary that introduced this level of accuracy.

Relative terms in a patent require a detailed inquiry into their true meaning. Such an inquiry requires thorough investigative measures such as consulting expert opinion and observing common practice in the field. By defining the term “about” under a literal infringement context, the court did not allow a full and complete doctrine of equivalents analysis to properly define the scope of the term and, by extension, of the patent.

2. Expanded equivalent infringement

In holding that Water’s 25 μm columns literally infringed Cohesive’s “about 30 μm ” claim, the court effectively enlarged the scope of equivalent infringement despite its own declaration that such a practice would be improper.⁹⁴ The court said that because the same “range of novelty” that was normally reserved to the doctrine of equivalents was now within the scope of literal infringement, “a patentee [could not] rely on the doctrine of equivalents to encompass equivalents of equivalents.”⁹⁵ While this statement, in principle, is correct and equitable, the court in its holding actually promulgated an expansion of equivalence by permitting the term “about” to fall within literal infringement.

Under the *Warner-Jenkinson* definition of equivalent infringement, “a product or process that *does not literally infringe* upon the express

91. *Id.* at 1370.

92. *See id.*

93. *Id.* at 1358.

94. *See id.* at 1372.

95. *Id.*

terms of a patent claim may nonetheless be found to infringe if there is 'equivalence.'"⁹⁶ This statement defines an equivalent to be something that does not literally infringe.⁹⁷ Therefore, by shifting "about" into the four corners of literal infringement, the court precludes itself from characterizing the accused device as an equivalent.⁹⁸ This renders the court's limitation that the doctrine of equivalents does not encompass an equivalent of an equivalent inapplicable as "about" is no longer an equivalent.

All of this reasoning by the court results in a double-broadening of the scope of the patent through equivalence. First, the scope of the patent is broadened under literal infringement through the interpretation of the term "about." The scope of the patent is broadened a second time through the doctrine of equivalents. It is this double-broadening that the court was trying to avoid by prohibiting the protection of an equivalent of an equivalent. It is also the exact result reached by the court when it pulled "about," a relative term in need of interpretation, into literal infringement.

3. *Altered balance between disclosure and protection*

The court's decision was also incorrect because it disturbed a hallmark of the patent system, the balance between public disclosure and patent protection.⁹⁹ To foster an adequate disclosure, Congress enacted the enablement requirement.¹⁰⁰ While the permitted use of relative terminology offers some relief from the enablement requirement, the disclosure still must be understood by one of ordinary skill in the art.¹⁰¹ The *Cohesive* court, by relying on its own interpretation of the term "about" rather than that of one having ordinary skill in the art, altered in

96. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997) (emphasis added).

97. *See Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 812 (Fed. Cir. 2002) ("Infringement under the doctrine of equivalents requires the patentee to prove that the accused device contains an equivalent for each limitation *not literally satisfied*." (emphasis added)).

98. The court's inconsistency on this point is manifest in the opinion as the court first noted that "by electing to include the broadening word 'about' in the claim, the patentee has . . . captured what would otherwise be equivalents within *the literal scope of the claim*," then later classified the term as an equivalent. *Cohesive*, 543 F.3d at 1372 (emphasis added).

99. *Unikel & Eveleigh*, *supra* note 3, at 143–44 ("The Supreme Court has made it clear that . . . the patent laws themselves, have two basic, intertwined goals: to foster and reward invention, and to promote public disclosure of inventions so as to stimulate further innovation.").

100. *Wegner*, *supra* note 16, at 258 (2004).

101. *See* U.S. Pat. & Trademark Office, *supra* note 39, § 2173.

part the enablement requirement and thus the balance between patent protection and public disclosure.

The doctrine of equivalents is a balancing act between adequate protection and adequate disclosure.¹⁰² An appropriate balance is impossible with relative terms and requires an accurate interpretation of these terms to determine the scope of the patent and whether that scope has been properly disclosed. Such an interpretation is best made by those with expertise in the field.¹⁰³ The *Cohesive* court failed to rely on a qualified interpretation of the terms. As a result, the accuracy of the court's interpretation cannot be verified because there is no indication of how one having ordinary skill in the art would understand it, as is required by the enablement requirement. Thus, without a qualified interpretation or any indication of the accuracy of the court's interpretation, there can likewise be no indication of whether the disclosure in the patent is adequate. Therefore, the court's acceptance of its own interpretation of "about" weakened the patent's responsibility to disclose to the public what had been invented.

4. Summary

The term "about" is relative by nature and is subject to many interpretations. To ensure that an accurate interpretation is used, a detailed analysis is needed. The doctrine of equivalents affords such a detailed analysis. Nevertheless, the *Cohesive* court termed "about" not to be a case of equivalent analysis, but rather one of literal analysis. This oversimplified the analysis, altered the scope of the patent under the doctrine of equivalents, and disrupted the established balance between patent protection and public disclosure. Thus, the analysis of the court was inadequate in light of the facts and complexity of the case.

IV. IMPLICATIONS OF THE *COHESIVE* DECISION

A. Introduction

The decision in *Cohesive* was not made in a vacuum; the misgivings of the court's holding reaches beyond the pages of the *Cohesive* record in

102. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 564 (Fed. Cir. 2000).

103. *See Revlon Consumer Prods. Corp. v. Estee Lauder Cos.*, No. 00 Civ. 5960 (RMB)(AJP), 2003 U.S. Dist. LEXIS 13004, at *43 (S.D.N.Y. July 30, 2003) (stating that an "expert's construction may be the only true meaning of the patent language.").

four ways.¹⁰⁴ First, the *Cohesive* decision affects patent drafting as drafters may be able to take advantage of relative terminology being considered under literal infringement, while equivalent infringement analysis, though still considered under the name of literal infringement, has been limited. Drafters could overbroaden the scope of a patent by relying on what could be a misinterpretation of the relative term by the court, rather than the actual interpretation by one having skill in the art. Second, since the court brought equivalent analysis into literal infringement,¹⁰⁵ the current and future state of the doctrine of equivalents is uncertain. Third, the greater latitude allowed in interpretation increases the opportunity for inventors and their attorneys to engage in inequitable conduct. Fourth, the shift in balance between public disclosure and patent protection reduces the economic value of a patent and inhibits the economic growth that patents were meant to stimulate.¹⁰⁶

B. Patent Drafting

A well-drafted claim is supremely important to the inventor because it is the portion of the patent that determines the extent of the protection for the invention.¹⁰⁷ Reducing an abstract idea to words is a very time-consuming, difficult task; to some it is an art.¹⁰⁸ Therefore, it is no surprise that patent drafters put much time and effort into drafting clear claims. A well-drafted claim by an experienced attorney gives the inventor adequate patent protection while disclosing to the public a clear scope of the patented invention. However, by relying on its own

104. The Author does not claim that these are the only four aspects of the law influenced by the *Cohesive* decision.

105. *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1372 (Fed. Cir. 2008) (“[A]bout 30 μm ’ encompasses particle diameters that perform the same function, in the same way, with the same result as the 30 μm particles . . . Thus, by electing to include the broadening word ‘about’ in the claim, the patentee has . . . captured what would otherwise be equivalents within the literal scope of the claim.”).

106. F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 698–99 (2000) (“Similarly, the primary impact of the American patent system is economic as well. . . . Economic research has shown that the national patent system has an important impact on long term international economic competitiveness and that patent law can function as a public policy tool for promoting national economic growth.”).

107. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 989 (Fed. Cir. 1995) (Mayer, J., concurring) (expressing the importance of the claims in litigation stating, “to decide what the claims mean is nearly always to decide the case.”), *aff’d*, 517 U.S. 370 (1996); *In re Vamco Mach. & Tool*, 752 F.2d 1564, 1577 n.5 (Fed. Cir. 1985).

108. *Zenon Envtl., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1382 n.3 (Fed. Cir. 2007).

interpretation rather than testimony from experts and common practice from the field, the court discourages such clear and precise patent drafting.

Patent drafting is an involved process that takes years of practice to perfect. With each invention, drafters spend numerous hours in consultation to ensure that the complete and accurate picture of that invention is protected in the patent. Because the accuracy of the court's interpretation cannot be determined, patent drafters are discouraged from perfecting the claims. Not knowing whether the court will adhere to the inventor's intended interpretation or use its own construct affects the cost and quality of applications.¹⁰⁹ On the one hand, prosecution costs become even more expensive as drafters spend even more billable hours poring over each word to a degree unwarranted by the patent. Or, by contrast, a drafter may simply draft a few quick claims, include some relative terms, move on to the next patent, and be no worse off for so doing—still being bound by the arbitrary interpretation of the court. This process, where a patent drafter intentionally drafts claims with indiscernible terminology to obtain unjustified protection, could lead to much more objectionable circumstances. More specifically, *Cohesive's* altering of the doctrine of equivalents threatens the effectiveness and frustrates the purpose of the claim itself. A broad interpretation of the doctrine of equivalents conflicts with the statutory enablement requirement for claims.¹¹⁰ The *Cohesive* court effectively expanded the scope of equivalent infringement, giving it a broader application and thereby reducing the effectiveness of the claim to define and protect an invention.¹¹¹

By interpreting the claims as it did, the court discouraged clear, definite drafting and may have opened the door for intentionally overambiguous drafting.

C. State of the Doctrine of Equivalents

In addition to potentially upsetting professional standards in patent drafting, the *Cohesive* decision also has thrown the entire doctrine of equivalents, including its relation to literal infringement, into a state of confusion. By including the doctrine of equivalents analysis within literal

109. See Scott R. Boalick, *Patent Quality and the Dedication Rule*, 11 J. INTELL. PROP. L. 215, 219–20 (2004).

110. Warner-Jenkinson Co., v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997); Alwin Mfg. Co. v. Global Plastics, 629 F. Supp. 2d 869, 874–75 (E.D. Wis. 2009).

111. See discussion *supra* Part III.B.2.

infringement, two potential outcomes may result. First, the doctrine of equivalents may disappear because the elements of its analysis would be entirely swallowed by literal infringement. Second, as discussed above, the doctrine of equivalents may remain intact, but the patent scope might be vastly broadened through the doctrine of equivalents.¹¹² While both of these results may represent extreme possibilities, they serve to illustrate that the Court of Appeals, by commingling equivalent analysis within a literal infringement context, has confused the state of the doctrine of equivalents.

1. Absorbed into literal infringement

Under the first potential outcome of *Cohesive*, literal infringement would become much more complex. By allowing a portion of the doctrine of equivalents analysis to fall under literal infringement,¹¹³ the *Cohesive* court has opened the door to let in the rest of the doctrines associated with equivalence analysis.¹¹⁴ This would invalidate the purpose of distinguishing between literal infringement analysis and equivalent infringement analysis altogether, discourage judicial economy, and back up the judicial docket. For example, a full doctrine of equivalents analysis,¹¹⁵ now being combined with literal infringement analysis, would no longer be utilized only after a literal infringement analysis but rather would be undertaken in every infringement case.

A completely different outcome could result where instead of the doctrine of equivalents elements being subsumed into literal infringement, these elements are abandoned completely. One example is the *Festo* limitation. Under the *Festo* doctrine, a patent owner is precluded from using the doctrine of equivalents to broaden claims that were intentionally narrowed during prosecution to facilitate the granting of a patent.¹¹⁶ However, by authorizing the doctrine of equivalents to fall under literal infringement, the *Cohesive* court has allowed for the potential abandonment of important equivalent limitations.

To illustrate the point, consider the simple example of an invention for a ball with a diameter of ten to twelve inches. Consider next that the examiner requires the patentee to amend the claim to limit the diameter

112. See *supra* Part III.B.2.

113. See *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1372 (Fed. Cir. 2008) (using the function-way-result test to determine literal infringement).

114. This includes but is not limited to items discussed in Part II.B.2.

115. See *supra* Part II.B.2.

116. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 734–35 (2002).

of the ball to twelve inches. Under *Festo*, the patentee is now precluded in future proceedings from claiming a ten inch diameter ball as being an equivalent to the claimed twelve inch diameter ball.¹¹⁷ Now suppose, rather, that the original patent, instead of claiming a ball with a diameter of ten to twelve inches, claimed a ball with a diameter of about twelve inches. Under *Cohesive* this is termed literal infringement, to which *Festo* does not apply, and thus a *Festo* limitation would be completely avoided.¹¹⁸ As a result, there is nothing in place to prevent finding that a ball of ten inches in diameter, which under *Festo* would be unpatentable and noninfringing, would be an infringement if the patent was instead phrased as “about twelve inches.”¹¹⁹ The overall ambiguity permitted in literal infringement under the *Cohesive* analysis provides more opportunities for the kind of behavior *Festo* was meant to limit, with less opportunity to protect against it through the *Festo* decision.

2. Broadened equivalent scope

The second outcome that could result from the inclusion of equivalent infringement into literal infringement is a broadening of the scope of equivalence. Under the pre-*Cohesive* framework, when infringement is not found by the literal terms of the claim, a patent owner may seek protection under the doctrine of equivalents.¹²⁰ Under a *Cohesive* interpretation of the standard system, one equivalence analysis occurs under literal infringement, although not expressly labeled as such, followed by the normal analysis under the doctrine of equivalents.¹²¹ This occurs in spite of *Cohesive*'s indication that doing so should not be allowed.¹²² Such a regime, therefore, permits two opportunities to broaden the patent. This could—and likely would—result in patents that protect more than what was actually invented.

As with all debated and controversial doctrines of law, lower courts, attorneys, and the public in general look to appellate courts to determine and clarify doctrines. Patent law and its doctrine of equivalents are no exception. In the patent system the United States Court of Appeals for the Federal Circuit has jurisdiction for all patent cases that are

117. *See id.*

118. *Id.*

119. *See id.*

120. *Black & Decker, Inc. v. Hoover Serv. Ctr.*, 886 F.2d 1285, 1295 (Fed. Cir. 1989).

121. *See supra* Part III.B.2.

122. *See id.*

appealed.¹²³ This affirms the relationship where lower courts look to the Court of Appeals for clarification. However, instead of providing direction and clarifying the doctrine of equivalents and its relation to literal infringement, the court blurred both the status of the doctrine of equivalents and its relation to literal infringement. While both potential resulting states of the doctrine of equivalents following *Cohesive* may be extreme, they suffice to illustrate the increased confusion resulting from the decision.

D. Promote Inequitable Conduct

The infringement analysis promoted in the *Cohesive* decision creates more opportunity for inequitable conduct at the drafting and prosecutorial stages. While maximizing protection of a patent within the newly created bounds is not unethical on its face, some attorneys may use the law as a mechanism to unjustly benefit themselves or their clients. The court's oversimplified analysis in *Cohesive* creates another avenue through which lawyers can so act.

The *Cohesive* court's simplified literal infringement/equivalent infringement hybrid analysis creates greater opportunity for crafty drafters to expand patent protection beyond the invented concept. By switching from a more thorough equivalent-style analysis to a simplified literal-style analysis, the court left out some elements of a standard equivalence analysis.¹²⁴ While at some point in the future all of these elements *may* join the equivalent infringement analysis, there is no telling how or when such a transformation will occur, and until that time, these elements will most likely be ignored entirely.¹²⁵ Thus, drafters, intending to evade a necessary full equivalence analysis when one might be justified and necessary, could draft patents to be intentionally ambiguous, avoid a thorough analysis, and obtain more patent protection than warranted. Again, although taking advantage of ambiguities is not in itself inequitable conduct, a distinction must be made between those attorneys who are fulfilling their professional duty to competently protect

123. See Fla. Prepaid Postsecondary Educ. Expense Bd. v. Coll. Sav. Bank, 527 U.S. 627, 651 (1999).

124. See discussion *supra* Part II.B.2.

125. This argument does not negate the discussion in Part IV.C.1 concerning the potential of absorbing all equivalent elements into literal infringement. It merely recognizes the time lag that will naturally occur as the full realm of equivalent analysis elements trickles in to the new, adapted literal infringement.

the interests of their clients and those attorneys who find gaps in the system and engage in deceptive and concealing practices. Those of the latter persuasion could create ambiguities wherein they may argue before a court to expand the actual scope of the invention. Even though such a practice is not inherently inequitable, it does promote concealment and contradicts the purpose of patent law to disclose the invention to the public. *Cohesive*'s double-broadening regime increases the likelihood of this type of deceptive practice, first through an equivalent-like literal infringement, and then again under the actual doctrine of equivalents analysis.¹²⁶

By restricting the use of expert witnesses and other analytical tools available in a jury consideration of equivalence,¹²⁷ the *Cohesive* decision creates more opportunities for an unpredictable and arbitrary outcome. The difference in the knowledge base of legal professionals and that of experts in the field creates gaps that patent drafters and inventors can exploit to gain unwarranted legal protection of something the inventor did not invent. While this difference itself is not improper, the danger lies in the clever drafter, who discovers an interpretation that falls into one of these gaps, being reasonable to a judge, but known to one having ordinary skill in the art to be unreasonable. These gaps highlight why many courts have stated that allowing lawyers to act as expert witnesses and offer their opinions as to claim interpretation is inappropriate.¹²⁸ This rule by extension should apply to judges as well, who lack the same expertise in the pertinent art as do lawyers. Although a court's role is to protect the substantive rights of the public and ensure justice, the *Cohesive* court failed to fulfill its role and provided more opportunities for wily drafters to engage in inequitable conduct.¹²⁹

E. Reduced Economic Value of the Patent

The great value of a patent both to the inventor and to the "[p]rogress of Science and useful Arts" is its power to exclude others from practicing the protected invention.¹³⁰ While broadening the scope of a patent under

126. *Supra* Part III.B.2. This result would occur despite the court's comment in *Cohesive* that such a result is undesirable. *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1372 (Fed. Cir. 2008).

127. *Supra* Part II.B.2.

128. *See Endress + Hauser, Inc. v. Hawk Measurement Sys. Pty. Ltd.*, 122 F.3d 1040, 1042 (Fed. Cir. 1997).

129. *Cohesive*, 543 F.3d at 1372.

130. U.S. CONST. art. I, § 8, cl. 8.

Cohesive increases the economic value of an individual patent, this value is offset as a whole as potential investors, unsure of what constitutes infringement of a particular patent, will refrain from investing in patents and the development of patentable ideas, thus impeding, rather than promoting “the Progress of Science and the useful Arts.”¹³¹

If nothing else, the *Cohesive* decision brought increased uncertainty into infringement litigation. Infringement litigation is an expensive endeavor without the increased uncertainty imposed by *Cohesive*.¹³² The *Cohesive* opinion increased the cost as a full equivalent analysis will now be undertaken in every case of infringement. To avoid this, the competent patentee will demand greater work to be done during prosecution, both in research and drafting, to ensure that the invention is accurately captured by the claims and avoids infringement.¹³³ Such an increase in cost would not only delay the ultimate public disclosure of a patent, but could also prevent some patents from ever being issued because some inventors can never hope to be able to afford the costly application process.¹³⁴

This uncertainty not only affects potential patentees but also society in general. The same fear and uncertainty that inhibit inventors from pursuing a patent weigh even more heavily upon investors who will potentially infringe. Thus, in a cost-benefit analysis, a large investor who could otherwise afford expensive patent acquisition may not be able to afford the potential damages resulting from a judgment of infringement and accordingly, decide not to invest at all. That is not to say this problem was created by *Cohesive*, just that it increased its frequency. As a result of this uncertainty, not only may fewer patents be prosecuted and issued, but investors, in an effort to keep as distant as possible from

131. *Id.*

132. Janice M. Mueller, *The Evanescent Experimental Use Exemption from United States Patent Infringement Liability: Implications for University and Nonprofit Research and Development*, 56 BAYLOR L. REV. 917, 961 n.212 (2004) (explaining that in 2003 the “average cost of a patent infringement suit with more than \$25 million at risk was \$2.5 million through the end of discovery, and approximately \$4 million for all costs, including discovery, trial and appeal” and that in 1999 about \$2 billion was spent on patent litigation (citing Am. Intell. Prop. Law Ass’n, *2003 Report of Economic Survey*, 22 (2003))).

133. Holbrook, *supra* note 15, at 29–30 (“Patent owners now . . . requir[e] greater upfront and perhaps unwarranted prosecution costs given the uncertainties of the prosecution process, of patent litigation, and of the ultimate value of the invention contained within the patent.”).

134. While slight in comparison to the cost of infringement litigation, preparing and filing a patent can range from \$6,000 to \$15,000. See Christopher A. Cotropia, *Modernizing Patent Law’s Inequitable Conduct Doctrine*, 24 BERKELEY TECH. L.J. 723, 780 (2009).

infringement, may not attempt to compete, and as a result, technological development of “Science and the useful Arts” could be hindered.¹³⁵

The implications of the *Cohesive* decision are far-reaching and illustrate that *Cohesive* was wrongly decided because of the uncertainty it promoted, the purposes of patent law that it contradicted, and the adverse economic effects which result to the potential patentee and society as a whole.

V. A PROPOSED METHOD AND HOW *COHESIVE* SHOULD HAVE BEEN ANALYZED

A. Introduction

After having addressed the rationale of the *Cohesive* court’s analysis and a few of its negative implications on patent law, this Note now offers a proposed method for analyzing relative terminology used in patent claims. It will also discuss how this proposed analysis might have changed the outcome in *Cohesive* while avoiding the negative implications of the *Cohesive* decision. This proposed method consists of defining “about” and other relative terminology to be definite terms that are to be interpreted by those of ordinary skill in the art. Such an interpretation takes the decision away from the court, puts it in qualified hands, maintains the integrity and simplicity of the literal infringement analysis, and promotes judicial economy.

B. A Proposed Method

In considering this proposed method, it must be immediately recognized that the *Cohesive* court was on the right track by determining that some form of a doctrine of equivalents analysis was necessary.¹³⁶ However, the court did not correctly apply the doctrine of equivalents to “about,” a relative term that deserves a much deeper analysis. Therefore, the first characteristic of the proposed method is a legal definition of relative terms such as “about,” which recognizes that the drafter’s purpose in using such terms is to allow the scope of a patent to be interpreted by a jury.

135. Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1425 (Fed. Cir. 1997) (“Society at large would bear these latter costs in the form of virtual foreclosure of competitive activity within the penumbra of each issued patent claim. Because the doctrine of equivalents blurs the line of demarcation between infringing and non-infringing activity, it creates a zone of uncertainty, into which competitors tread only at their peril.”).

136. See *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1372 (Fed. Cir. 2008).

The second element of the proposed method requires courts to acknowledge that the legal definition of relative terms should be a question of fact subject to interpretation by those with ordinary skill in the art. The problem with the current system is that upon including a relative term into the literal terms of a patent, the potential patentee is still subject to the interpretation of the court in a *Markman* hearing.¹³⁷ Thus, one might rightfully say that such a situation puts the inventor in no better position. Whether the interpretation is done by the court through literal infringement, as in *Cohesive*, or through a *Markman* hearing, the patent owner is still subject to the discretion of the court. The definition of the relative term would be deemed unambiguous, thus alleviating the need to have it interpreted during a *Markman* hearing.

The third element of the proposed method is to ignore the relative term altogether when considering literal infringement. Without this element, the same problem of reduced judicial efficiency resulting from *Cohesive* would result.¹³⁸ This element is necessary to maintain the separation between literal infringement and equivalent infringement. This separation serves to promote judicial economy by restricting literal infringement use to those cases where it is necessary while still providing the doctrine of equivalents remedy when justified.

The last characteristic of the proposed method is to label interpretation of relative terminology a question of fact, not of law. This returns the decision-making power to the jury and, by extension, to one having ordinary skill in the art, thus ensuring that a more accurate interpretation and scope are determined.

C. Problems Resolved by the Proposed Method

The proposed method solves many of the problems evidenced in the *Cohesive* decision. First, it does not alter any existing doctrine. Second, it protects the value of the patent to both the patentee and the public by maintaining the established balance between patent protection and public disclosure. Lastly, it promotes judicial economy. In summary, the proposed method increases the likelihood that an accurate scope of the patent will be determined in an efficient, cost-effective manner.

137. See *Golden Blount, Inc. v. Robert H. Peterson Co.*, 365 F.3d 1054, 1063 (Fed. Cir. 2004) (characterizing and deciding infringement matters as a matter of claim construction). A *Markman* hearing is a pretrial claim construction hearing where interpretation is decided by a judge. Donald S. Chisum, 5A-18 CHISUM ON PATENTS § 18.06 (2011).

138. See *supra* Part IV.C.1.

1. Does not alter existing doctrine

The *Cohesive* decision had the potential to drastically alter literal infringement and the doctrine of equivalents and the interaction between them.¹³⁹ Additionally, the status of the enablement requirement was put into question as the relative term “about” was interpreted broadly. By using the proposed method, none of the underlying doctrines or their applications change. All that changes is that relative terms such as “about” are labeled and treated as ordinary understanding indicates they should be.

2. Protects value of a patent to owner and public

In a similar fashion, the proposed method protects the value of a patent by leaving doctrines of patent law unaltered. The patent owner can still reasonably rely on the same literal and equivalent infringement analysis to enforce and obtain adequate protection for his patent. Likewise, the public is under no greater threat from ignorant infringement as the enablement requirement, and an interpretation is still made by one having ordinary skill in the art.

One might argue that under this proposed method, which allows relative terms to be used in a patent, the ability to clearly disclose the invention is diminished. However, the same amount of disclosure exists under the proposed framework as under the pre-*Cohesive* standard, which allows relative terminology in a patent. Under the pre-*Cohesive* standard, a competitor attempting to design around a patent could only make a product and hope that it did not infringe through equivalence. The proposed method is no different. In fact, by permitting relative terminology in a patent, the proposed method may increase disclosure, as the allowance of such terms put any potential improvers on notice that equivalents are included within the scope of the patent.

3. Promotes judicial economy

By allowing the term “about” to be ignored under literal infringement analysis, judicial economy is promoted, as relatively simple cases can be dealt with quickly, while those cases requiring more analysis are investigated. While it may seem counterintuitive to ignore an express term in a claim, the result is no different than under the standard system. Under the standard system, a device not falling within a numeric

139. See *supra* Part IV.C.

range does not literally infringe. The court then determines whether it infringes under the doctrine of equivalents. By ignoring the term “about,” the same device does not literally infringe under the proposed method. Only during an equivalent analysis is the term considered, which is the same as the pre-*Cohesive* system. Thus, the judicial docket is maintained in its pre-*Cohesive* state.

4. Summary

The overall benefit of the proposed method is that it does not change anything. Years of precedent and judicial analysis have established a system that works. *Cohesive* suggests turning all that upside down. The proposed method, by comparison, merely attempts to apply established doctrine to a new situation. The adaptation proposed under the proposed method does not alter any existing legal doctrine, it retains the value of a patent by maintaining the balance between disclosure and protection, and it promotes judicial economy.

D. The Proposed Method Applied to Cohesive

It is hard to say with any degree of certainty how *Cohesive* would have been decided had the proposed method been utilized. However, it is no stretch to imagine that the result could have been dramatically different in several elements of the court’s analysis. By more closely inspecting 1) the knowledge of those having skill in the art, 2) the knowledge of the patentee, and 3) assumptions inherent in a relative term, the court may have reached a different decision.

First, the aspect of the proposed method that would have had the most profound difference in the outcome is its reliance on experts in the field, instead of a judge, to decide the scope of the patent. The court said that “particle diameters that perform the same function, in the same way, with the same result as the 30 μm particles,”¹⁴⁰ are “about 30 μm .” The court then simply mentions that this “same result” is achieving turbulence without any further investigation as to whether it in fact was the same result.¹⁴¹ Under the proposed method, the court would have looked into what the field actually determines to be a “same” result. Also, in defining “about 30 μm ,” the court relied on an arbitrary statistical analysis of a batch of particles with a diameter of 50 μm with

140. *Cohesive*, 543 F.3d at 1372.

141. *See id.* at 1368–69 (“[T]hat turbulence could not be attained with particles of 20 μm diameters. Thus, about 30 μm cannot include 20 μm .” (internal quotations and citation omitted)).

no indication that the analysis could validly extend to define “about 30 μm .”¹⁴² Under the proposed method, instead of engaging in an unsubstantiated statistical analysis,¹⁴³ the court would simply rely on testimony from the field.

Second, an important element in any equivalent analysis is the question of whether the patentee should have or did know of the infringing device.¹⁴⁴ In *Cohesive*, by considering equivalent terminology under literal infringement, it appears the court dropped this element from the analysis.¹⁴⁵ This element would have been addressed under an analysis using the proposed method.

Lastly, the court also decided that 20 μm , because it could not achieve turbulence, was therefore *not* “about 30 μm .”¹⁴⁶ This conclusion by the court is based on a desired characteristic rather than on what actually *is* “about 30 μm .”¹⁴⁷ Rather than interpreting with an assumption of validity, the court should have first interpreted the term based on how one having ordinary skill in the art would have understood the term and then determined validity. The fact finder under the proposed method could do this by relying on expert testimony to define “about 30 μm ” and then used that definition to determine whether 20 μm really was valid or not.

While a determination of how the *Cohesive* court would have ruled under the proposed method requires the jury to consider the testimony of how one of ordinary skill in the art would have understood “about,” the points discussed above illustrate the great likelihood that a different result could have arisen from an application of the proposed method to the *Cohesive* facts.

VI. CONCLUSION

The doctrine of equivalents is a naturally obscure and confusing doctrine. As such, appellate courts should provide direction on the matter. In *Cohesive*, the Court of Appeals had the opportunity to clarify the doctrine of equivalents and its relation to literal infringement. However, through an oversimplified analysis, an unnecessary expanding of the equivalent analysis, and an upsetting of the balancing between

142. *Id.*

143. *See supra* Part III.B.1.

144. *See supra* Part II.B.2.e.

145. *Cohesive*, 543 F.3d at 1371.

146. *Id.* at 1369.

147. *Id.*

patent protection and public disclosure, the court muddied the doctrine. Had the court used the proposed method, it could have avoided the patent broadening, uncertainty, increased potential for fraud, and reduced economic patent value that were manifest as a result of the *Cohesive* decision.

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