

Defeating Patent Trolls at the Pleading Stage: A New Approach to Attacking Means-Plus- Function Patents

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Abstract

Courts have recently been struggling to answer an open question related to whether patent validity can be challenged at the pleading stage. In Alice Corp. v. CLS Bank International, the Supreme Court created a “litigation gatekeeper” for patent eligibility claims. Yet, lower courts come to conflicting conclusions when faced with early-stage motions to dismiss based on validity. No article has focused on how the analytical framework used by district courts in a motion to dismiss for ineligibility under Alice can be extended to other areas of patent law. I conclude that patent validity may be determined as an issue of law for a judge. As an issue of law, validity can be challenged at the pleading stage for a portion of patents that cannot be revived through claim construction.

The Article proposes an analytical framework that mirrors the steps of patent ineligibility for district courts to use when faced with a motion to dismiss for invalidity with means-plus-functions claims. Means-plus-function claims present broad language that makes them more susceptible to abuse by non-practicing entities who intend on asserting overbroad patents to force settlements (known as “patent trolls”). District courts have been wary to entertain motion to dismiss on invalidity at the pleading stage, creating a “settled practice” of delaying a ruling. But, by delaying a ruling, district courts are providing economic ammunition to patent trolls, which creates a hardship for many alleged infringers. In short, by using the provided framework, alleged infringers are protected by resolving claims early in litigation, which lowers the transactional cost of challenging overbroad patents and promotes innovation and growth within the patent system.

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“[A] country without . . . good patent laws was just a crab, and couldn’t travel any way but sideways or backwards.”

- Mark Twain (1889)¹

I. Introduction

Patent litigation has an open question that has the potential to be quite powerful but has not reached its full potential. Means-plus-function claiming is statutorily encompassed in 35 U.S.C. § 112(f), which some district courts have held to be “inextricably intertwined” with claim construction.² However, the analysis is not so simple. Whether patent validity can be determined with a pleading stage motion is an open question for district courts. The courts have been split as to whether they can entertain

¹ MARK TWAIN, A CONNECTICUT YANKEE IN KING ARTHUR’S COURT 107 (Charles L. Webster & Company 1889).

² See, e.g., *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019) (quoting *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999)).

such a motion and have taken different approaches when analyzing validity at the pleading stage. By making a small procedural change to the § 112(f) analytical framework, district courts would have guidance on how to determine the validity of means-plus-function claims through an early motion.³

Making this procedural change to the § 112(f) framework will not only aid district court judges but also the patent system because “patent trolls” will lose leverage.⁴ Patent trolls are not a new concept, causing problems for practicing entities through aggressive litigation.⁵ In turn, society is hurt because innovation is stymied by broad patents that can apply to a plethora of potential defendants, which are the specific type of patents that trolls want to acquire.⁶ Trolls do not care if a patent is valid.⁷ The sole objective for patent trolls is whether they can force alleged infringers into a settlement.⁸ Therefore, the elimination of overbroad, invalid patents is a “sword” to remove the leverage that trolls wield against alleged infringers. Lowering the cost to invalidate overbroad patents not only benefits the alleged infringers, but society at large.⁹

This Article will discuss patent validity, patent trolls, and as a comparison,

³ Either through a motion to dismiss under Federal Rule of Civil Procedure 12(b)(6) or a motion on the pleadings under Rule 12(c). *See* FED. R. CIV. P. 12(b)(6), (c).

⁴ “Patent Trolls” are defined as non-practicing entities that accumulate patents for the sole purpose of aggressive litigation, asserting the patents against potential infringers to force a settlement and license. PRESIDENT’S COUNCIL OF ECON. ADVISERS ET AL., EXEC. OFF. OF THE PRESIDENT, PATENT ASSERTION AND U.S. INNOVATION 3–4 (2013), https://obamawhitehouse.archives.gov/sites/default/files/docs/patent_report.pdf [hereinafter PRESIDENT’S COUNCIL OF ECON. ADVISERS]. While there are other correct terms for these entities, such as “non-manufacturing entity” (NMEs) or “patent assertion entity” (PAEs), for consistency and clarity in this discussion, these entities will be referred to as patent trolls. *See* Caroline Coker Coursey, *Battling the Patent Troll: Tips for Defending Patent Infringement Claims by Non-Manufacturing Patentees*, 33 AM. J. TRIAL AD. 237, 238 (2009) (recognizing “non-manufacturing entity” as a politically correct term); *see also* PRESIDENT’S COUNCIL OF ECON. ADVISERS, *supra* note 4, at 1 (using the term “patent assertion entity”).

⁵ PRESIDENT’S COUNCIL OF ECON. ADVISERS, *supra* note 4, at 1 (“[Patent trolls] focus on aggressive litigation, using such tactics as: threatening to sue thousands of companies at once, without specific evidence of infringement against any of them; creating shell companies that make it difficult for defendants to know who is suing them; and asserting that their patents cover inventions not imagined at the time they were granted.”). The first recognized patent troll was George Seldon, who waited to file his patent on a “road engine” until automobile manufacturers developed their technology in the late 18th century for the sole purpose of asserting the patents. Robert H. Resis, *History of the Patent Troll and Lessons Learned*, 17 INTELL. PROP. LITIG., 1, 2 (2006).

⁶ Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2128 (2013). Lemley and Melamed discuss three types of patent trolls, which they call “lottery-ticket” trolls, “bottom-feeder” trolls, and “patent aggregators.” *Id.* at 2126. Although lottery-ticket trolls are the most traditional, this Article is focused on the bottom-feeder trolls and the patent aggregators because those types are the most likely to assert overbroad, invalid patents in search of a quick settlement. *Id.* at 2128.

⁷ *Id.* at 2128.

⁸ *See id.* at 2126 (“[A] growing number of trolls are interested in quick, low-value settlements for a variety of patents.”).

⁹ *See* discussion *infra* Section IV.C.

patent eligibility. Much ink has been spilled over these topics;¹⁰ however, most scholars have focused on the impacts of the new eligibility standard set by the Supreme Court in *Alice Corp. v. CLS Bank International* (“*Alice*”) and how the standard impacts trolls.¹¹ Meanwhile, the focus of this Article is on means-plus-function claims. Although these claims are included in only a small subset of patents, they propose a large risk of abuse by patent trolls. The current status of most district courts for § 112(f) claims disproportionately benefits trolls over alleged infringers because the settled practice is to delay a potential disposition of a case until a claim construction hearing,¹² which in turn increases litigation costs.¹³ Justice is not being met with means-plus-function claiming because the high cost of litigation provides trolls with more leverage; the same leverage that this Article intends to attack.

Further, this Article uses *Alice* as support. Patent eligibility laid dormant for 40 years.¹⁴ In 2014, with the holding of *Alice*, the Supreme Court breathed new life into the patent eligibility standard.¹⁵ This decision regarding eligibility has transformed patent litigation, creating a “litigation gatekeeper.”¹⁶ Some commentators believed the transformation left patent litigation in a worse state than before,¹⁷ while others

¹⁰ See, e.g., Lemley & Melamed, *supra* note 6, at 2126–28 (discussing the types of patent trolls); Greg Reilly, *Linking Patent Reform and Civil Litigation Reform*, 47 LOY. U. CHI. L.J. 179, 193 (2015) (“[F]or proponents of civil litigation reform, patent litigation offers a perfect example of high discovery costs and a vivid example of the purported consequences of problematic discovery: patent trolls.”); Paul R. Gugliuzza, *The Procedure of Patent Eligibility*, 97 TEX. L. REV. 571, 614 (2019) (discussing how the timing eligibility resolutions changed, creating a “recent reemergence of the eligibility requirement.”).

¹¹ See, e.g., David O. Taylor, *Confusing Patent Eligibility*, 84 TENN. L. REV. 157, 158 (2016) (the impact of the Supreme Court’s decision in *Alice* on the patent); Jacob S. Sherkow, *The Natural Complexity of Patent Eligibility*, 99 IOWA L. REV. 1137, 1189–91 (2014) (discussing how *Alice* will improve the quality of patents); Daryl Lim, *Standard Essential Patents, Trolls, and the Smartphone Wars: Triangulating the End Game*, 119 PENN. ST. L. REV. 1, 82 (2014) (discussing the heightened requirements required by *Alice*).

¹² *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019) (“[T]he settled practice among district courts [is] awaiting determination of indefiniteness arguments until after a *Markman* hearing and claim construction.”); see also Stephen Yelderman, *Prior Art in the District Court*, 95 NOTRE DAME L. REV. 837, 854 (2019) (finding that only three patents were found to be indefinite at the pleading stage and 344 were found invalid at the claim construction/summary judgment stage).

¹³ See AM. INTEL. PROP. L. ASS’N., REPORT OF THE ECONOMIC SURVEY 51 (2019) (reporting a range of \$40,000 to \$200,00 in litigation costs for initial case management compared to \$250,000 to \$2.5 million in litigation costs for discovery, motions, and a claim construction hearing) [hereinafter ECONOMIC SURVEY].

¹⁴ Gugliuzza, *supra* note 10, at 573.

¹⁵ See *id.* at 574 (“The Supreme Court’s decisions on eligibility have transformed patent litigation. Eligibility was rarely litigated less than a decade ago, but it is now the central concern in many cases.”).

¹⁶ Benjamin E. Leace & Christopher H. Blaszkowski, *Curiouser and Curiouser: Is ‘Alice’ the Long-Sought Troll Killer?*, THE LEGAL INTELLIGENCER (Apr. 1, 2015, 12:00 AM), <https://www.law.com/thelegalintelligencer/almID/1202722178629/>.

¹⁷ See generally, e.g., Taylor, *supra* note 11, at 158 (discussing how the Supreme Court’s decision in *Alice* is detrimental to the patent system because it causes “confusion, lack of administrability, and risk of under-investment in research and development.”).

believe the changes improved not only patent litigation but the entire patent system.¹⁸ The analytical framework at the pleading stage created in *Alice* relates to the proposed analytical framework in this Article for means-plus-function claims. Thus, similar to how a challenge to eligibility through an *Alice* motion works as a “litigation gatekeeper” to find improper patents ineligible to benefit the alleged infringer and the patent system, a challenge to validity through the proposed framework at the pleading stage can invalidate another type of improper patents to benefit the alleged infringer and the patent system.

Additionally, empirical evidence displays that the Supreme Court’s decision in *Alice* provided justice to alleged infringers. From 2011 to 2017, approximately 71% of ineligible patents in litigation were disposed of at the pleading stage, likely most of them after the decision in *Alice*.¹⁹ By disposing of the patent at the pleading stage, the cost to alleged infringers is significantly reduced.²⁰ In turn, patent trolls’ abusive, litigious behavior is reduced because the threat of expensive litigation against a practicing entity is reduced.²¹

Meanwhile, in contrast to eligibility challenges, less than 1% of claims found to be invalid under indefiniteness were disposed of at the pleading stage.²² While it is unknown how many of those claims were means-plus-function claims, overall, providing alleged infringers with an early exit to aggressive patent litigation to significantly reduce litigation costs benefits the patent system by reducing abusive troll behavior and limiting the number of improper patents in the system.

This Article explores the potential of using § 112(f) challenges at the pleading stage to efficiently invalidate conventionally “bad patents” and how society is damaged by delaying such judgments. Section II provides a brief background of § 112(f) and how district courts have left an open question as to whether litigators can challenge the validity of patent claims at the pleading stage. Section III provides an analytical framework to answer the open question, allowing for pleading stage motions to dismiss to challenge patent validity. Further, Section III compares the proposed framework to the framework created in *Alice*, and, due to the similarities, argues that the *Alice* framework supports the ability to challenge means-plus-function validity at the pleading stage. Finally, Section IV offers public policy reasons for allowing early

¹⁸ See Sherkow, *supra* note 11, at 1189–91 (discussing how *Alice* will improve the quality of patent applications and specifications); Lim, *supra* note 11, at 81–82 (“Where there is bad faith litigation, such as those brought by PAEs, courts have a number of devices at their disposal. . . . In *Alice*, the Court further addressed the concern over abusive patent litigation by imposing heightened requirements to obtain a patent for software and business methods.”).

¹⁹ See Yelderman, *supra* note 12, at 854 (finding 360 out of 509 patents were found ineligible at the pleading stage).

²⁰ See ECONOMIC SURVEY, *supra* note 13, at 51.

²¹ Leace & Blaszkowski, *supra* note 16 (“In suitable cases, this streamlined approach may also reduce the likelihood and amount of nuisance settlements a non-practicing entity (NPE—some of whom are referred to as patent trolls) may try to elicit.”).

²² Yelderman, *supra* note 12, at 854 (finding 3 out of 357 patents were found ineligible at the pleading stage).

exits to alleged infringers through § 112(f) challenges to fight off patent trolls. District courts require a clearer framework to answer the open question and grant early procedural challenges. This framework protects practicing entities from patent trolls by resolving issues at the pleading stage, which in turn saves the progression of research.

II. Challenging Means-Plus-Function Validity at the Pleadings Stage

This Section of the Article introduces the issue of determining whether the validity of means-plus-function claims is a matter of law, a matter of fact, or a mixture of law and fact. An alleged infringer of a patent may assert the invalidity of the patent as a defense—“that is, he may attempt to prove that the patent never should have been issued in the first place.”²³ If a validity defense is raised, there are three main points when determinations are made: during a trial, after a hearing reviewing the construction of the patent claims at issue, or before said hearing. The different points have created confusion as to whether invalidity defenses are determined as matters of fact, matters of law, or a mixture of both because the Federal Circuit has allowed both juries and courts to determine validity under this provision.²⁴ This confusion is a strong reason why district court judges are wary of reviewing validity arguments at the motion to dismiss stage.

One statutorily provided defense to validity involves means-plus-function claims under § 112(f).²⁵ Based on case law, it is apparent district court judges do not want to review validity challenges for means-plus-function claiming at the pleading stage.²⁶ However, as discussed later, the fact/law distinction is amendable for § 112(f) challenges, which can be resolved early in litigation.

A. Section 112(f) Analysis

Section 112(f) is the statutory provision for “means-plus-function” claim limitations in a patent.²⁷ A mean-plus-function claim is a form of patent claim that expresses an element by the function to be performed rather than by structure, material, or act.²⁸ First, we must understand when the provisions of § 112(f) are applied and how courts analyze the corresponding claims. This Article does not argue that the analysis of patent validity under § 112(f) should be overhauled, only that there should be a small alteration to help courts determine *when* to review validity.

Most courts have analyzed 112(f) under the broad umbrella of other indefiniteness challenges. Under the broader indefiniteness doctrine of § 112, a claim is invalid

²³ *Microsoft Corp. v. I4I Ltd. P’ship*, 564 U.S. 91, 96 (2011).

²⁴ *See* Paul R. Gugliuzza, *Law, Fact, and Patent Validity*, 106 IOWA L. REV. 607, 612 (2021).

²⁵ *See* 35 U.S.C. § 112(f).

²⁶ *See infra* Section II.C.

²⁷ Robert A. Matthews, Jr., *General Aspects of Means-Plus-Function Limitations*, ANNOTATED PAT. DIG. § 8:1 (2024).

²⁸ *See* *Phillips v. AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (“Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function.”); *see also* 35 U.S.C. § 112(f).

if its language “fail[s] to inform” a PHOSITA about the scope of the invention, in light of the specification and prosecution history.²⁹ However, means-plus-function claims “involve[] different requirements to establish definiteness” than an analysis under a different indefiniteness provision would require.³⁰ The statutory language of § 112(f) provides that:

[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.³¹

The statutory language creates a two-step analysis of patent claims.³²

The first step of analyzing a means-plus-function claim is to determine if § 112(f) is “invoked.”³³ Whether or not a claim “invokes” the statutory provisions of means-plus-function claiming is accomplished using a three-prong test.³⁴ The first prong involves determining whether the claim language uses “means,” “step,” an equivalent “nonce term,” or any other equivalent thereof.³⁵ A “nonce term” is a term that is simply a substitute for the word “means.”³⁶ If a claim element does not include the specific term “means,” then a rebuttable presumption that § 112(f) does not apply is triggered.³⁷ However if the party advocating for § 112(f) being invoked shows that the claim element uses language equivalent to “means,” then the presumption created is rebutted, and § 112(f) applies.³⁸ The second prong analyzes whether the term used in the first step is modified by functional language.³⁹ There must be an identifiable

²⁹ *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

³⁰ *Lite-Netics, LLC v. Nu Tsai Cap. LLC*, 678 F. Supp. 3d 1115, 1130 (D. Neb. 2023); see *Stuart v. Rust-Oleum Corp.*, 272 F.Supp.3d 1019, 1027 (S.D. Ohio 2017) (where the parties disputed whether the “means-plus-function rule is more amenable to a legal determination as opposed to the fact-intensive analysis required under” § 112(b)).

³¹ 35 U.S.C. § 112(f).

³² See *Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1297–1302 (Fed. Cir. 2018) (determining first whether the statute applies and then whether the specification discloses sufficient structure).

³³ MPEP § 2181 (9th ed. Rev. 7, Feb. 2023).

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* Examples of other terms that have been held to be generic placeholders includes “mechanism for,” “module for,” “device for,” “unit for,” “component for,” “element for,” “member for,” “apparatus for,” “machine for,” or “system for.” *Id.* (listed case citations omitted). However, there is no fixed list of words. *Id.*

³⁷ *Id.*

³⁸ *Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1299–1300 (Fed. Cir. 2018) (“Thus, in appropriate cases, a party advocating that a claim limitation that does not recite the word ‘means’ is subject to § 112[(f)] can overcome the presumption against its application solely by reference to evidence intrinsic to the patent.”).

³⁹ MPEP § 2181 (9th ed. Rev. 7, Feb. 2023). The language may not use the transition term “for,” but another linking word or phrase, such as “configured to” or “so that.” *Id.*

function to invoke § 112(f).⁴⁰ Finally, the last prong reviews whether the term used in the first step is modified by a sufficient structure, material, or act.⁴¹ If the first two prongs are satisfied and there is no sufficiently definite structure, material, or act modification present, then § 112(f) is properly invoked.⁴² With the invocation of the statute, the court continues to the second step.

The second step of the analysis involves determining whether there is sufficient description of a structure in the specification to adequately disclose the functions claimed.⁴³ The statutory language restricts the scope of the patent to “only the structure, materials, or acts described *in the specification* as corresponding to the claimed function and equivalents thereof.”⁴⁴ A “structure” of an invention explains definite materials or steps that accomplish the function claimed in the patent element.⁴⁵ As an initial inquiry, the court must determine “whether [a] structure *is* described in [the] specification.”⁴⁶ A total omission of a structure cannot satisfy the requirements of § 112(f).⁴⁷ Even when a structure is provided in the specification, if an applicant has not set forth an adequate disclosure, then the inventor has not distinctly claimed the invention.⁴⁸ An adequate disclosure includes a structure that corresponds to the means limitation in the claim language.⁴⁹ A lack of corresponding disclosure would require a ruling the patent is invalid.⁵⁰

The two-step test is utilized by courts when analyzing means-plus-function claims. Yet, the Federal Circuit has permitted for this determination to be made at different points in litigation,⁵¹ confusing as to whether § 112(f) is a matter of fact

⁴⁰ See *York Prods., Inc. v. Cent. Tractor Farm & Fam. Ctr.*, 99 F.3d 1568, 1574 (Fed. Cir. 1996) (“Without an identified function, the term ‘means’ in this claim cannot invoke 35 U.S.C. § 112[(f)].”); *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997) (holding method claim that paralleled means-plus-function apparatus claim but lacked “step for” language did not invoke because the statute “is implicated only when steps *plus function* . . . are present.”).

⁴¹ See *Seal-Flex, Inc. v. Athletic Track and Ct. Constr.*, 172 F.3d 836, 849 (Fed. Cir. 1999) (Radar, J., concurring) (“Even when a claim element uses language that generally falls under the step-plus-function format, however, [35 U.S.C. § 112(f)] still does not apply when the claim limitation itself recites sufficient acts for performing the specified function.”).

⁴² See *id.*

⁴³ *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994).

⁴⁴ See *Williamson v. Citrix Online, LLC (Williamson II)*, 792 F.3d 1339 (Fed. Cir. 2015) (interpreting the pre-AIA equivalent of § 112(f)) (emphasis added); see also *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1382 (Fed. Cir. 1999) (“Fulfillment of the [§ 112(f)] tradeoff cannot be satisfied when there is a total omission of structure. There must be structure in the specification.”).

⁴⁵ See *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1353 (Fed. Cir. 2010) (en banc).

⁴⁶ *Atmel*, 198 F.3d at 1381.

⁴⁷ *Id.* at 1382.

⁴⁸ *Id.* (“[T]he corresponding structure(s) of a means-plus-function limitation must be disclosed in the written description in such a manner that one skilled in the art will know and understand what structure corresponds to the means limitation. Otherwise, one does not know what the claim means.”).

⁴⁹ *Id.* at 1381–82.

⁵⁰ *Williamson II*, 792 F.3d 1339, 1354 (Fed. Cir. 2015).

⁵¹ See *Gugliuzza*, *supra* note 24, at 654–55 (“If a case is not dismissed at the pleading stage . . . the next opportunity for dispositive disposition is summary judgment.”; “[T]he Federal Circuit has approved of giving the question of indefiniteness to the jury . . .”).

determined by juries, a matter of law determined by judges, or a mixed question of fact and law. By resolving this confusion of how and who makes these determinations, we can thenceforth resolve the question of when to challenge.

B. Mixed Question of Fact and Law

Underlying alleged infringers' defense of patent invalidity under § 112(f) are questions of who decides validity issues and how those decisions are made. First, some cases resolve validity with a jury determination at trial.⁵² Juries typically decide questions of fact,⁵³ which indicates that patent validity under indefiniteness is a matter of fact outside the discretion of a judge. However, historically, validity issues have been solely left to the discretion of a judge.⁵⁴ Most cases resolve validity under the discretion of judges, who have made their determinations either after a full opportunity to litigate the claims in a hearing or on the record present at the pleading stage.⁵⁵ By allowing both juries and courts to determine validity under this provision, the Federal Circuit has created confusion as to whether the statutory provisions of § 112(f) are determined as matters of fact, matters of law, or a mixture of both.⁵⁶

This Part analyzes the different times when validity defenses under indefiniteness are resolved. Based on these differences, there is conclusive evidence showing that the indefiniteness analysis includes mixed questions of fact and law. The mixture of fact and law can blur the analysis for district courts when making determinations of a patent's validity at the pleading stage. Yet, if a court could simplify the factual determination in the analysis, then it would only be left with a legal determination that is ripe for resolution.

First, some will argue the Federal Circuit has indicated that indefiniteness may be a factual consideration for a jury. The Federal Circuit has seemingly approved of juries making indefiniteness determinations.⁵⁷ In cases of general indefiniteness, the Federal Circuit has stated that a jury is making determinations on the underlying

⁵² See *id.* at 654.

⁵³ See *Sparf v. United States*, 156 U.S. 51, 102 (1895) (noting that the jury has “the responsibility of applying the law so declared to the facts as they, upon their conscience, believe them to be.”).

⁵⁴ See John R. Allison & Lisa L. Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure*, 65 DUKE L.J. 609, 658 (2016). The determination by judges is further divided between decisions made after a *Markman* hearing and decisions made in the pre-discovery stage.

⁵⁵ See, e.g., *In re TLI Commc'ns LLC Pat. Litig.*, 87 F. Supp. 3d 773, 782 (E.D. Va. 2015) (finding defendants' motion ripe for disposition after full briefing and a *Markman* hearing); *Cisco Sys., Inc. v. Uniloc USA, Inc.*, 386 F. Supp. 3d 1185, 1192–93 (N.D. Cal. 2019) (granting a motion for judgment on the pleadings after finding “that construction of these terms would not aid or alter the Court's determination today regarding the subject matter eligibility of the '522 patent.”).

⁵⁶ One scholar, Paul Gugliuzza, proposes that “all questions of patent validity are, ultimately, mixed questions of law and fact.” See Gugliuzza, *supra* note 24, at 607 (emphasis added).

⁵⁷ See, e.g., *Koninklijke Philips N.V. v. Zoll Med. Corp.*, 656 F. App'x 504, 527–28 (Fed. Cir. 2016); *Bombardier Recreational Prods., Inc. v. Arctic Cat, Inc.*, 785 F. App'x 858, 865–68 (Fed. Cir. 2019) (“The jury found . . . that these claims were invalid on the grounds of indefiniteness and anticipation. [. . .] Because the evidence presented at trial is sufficient to sustain the verdict, and neither party disputes the jury instructions, we conclude that a jury finding on this issue was proper.”).

factual disputes, which include weighing competing expert testimony presented by the parties.⁵⁸ Further, in cases where a jury decides indefiniteness, the Federal Circuit has reviewed the determination under the deferential “substantial evidence” standard.⁵⁹ The underlying factual disputes could overtake the determination and indicate that patent validity under indefiniteness is a matter of fact outside the discretion of a judge. The threat of jury trials already looms large over patent parties in an infringement litigation.⁶⁰ The Federal Circuit approving jury determinations on indefiniteness aggravates such threat.

Yet, a second argument is that indefiniteness is solely a question of law. In support of this argument, the fact that indefiniteness is most commonly resolved with a summary judgment motion at the *Markman* hearing stage displays that it is a question of law.⁶¹ A *Markman* hearing is a term-of-art stemming from the Supreme Court’s decision in *Markman v. Westview Instruments, Inc.*,⁶² where a district court judge decides the meaning and scope of certain words and phrases of a patent claim.⁶³ In these hearings, the district court judge considers both intrinsic evidence and extrinsic evidence.⁶⁴ The Supreme Court ruled that judges, rather than juries, are more likely to give the proper interpretation of a patent claim that is in dispute.⁶⁵ Interpretation of claim language has been the exclusive privy of the court, as a matter of law.⁶⁶ As a part of the interpretation, underlying disputes, such as weighing competing expert testimony presented by the parties, are decided by a judge when ruling on the construction of the claim.⁶⁷ Concurrent with a district court’s exclusive review of claim construction, many judges make decisions regarding indefiniteness at the same time as its *Markman* ruling.⁶⁸

Further, when a determination is made by a district court on the issue of

⁵⁸ *Arctic Cat*, 785 F. App’x at 867–68 (“Because the jury found the claims indefinite, we presume that it resolved the underlying factual issues . . .”).

⁵⁹ See Gugliuzza, *supra* note 24, at 654.

⁶⁰ See *id.* at 656 (“The prospect of a jury trial looms large in patent litigation because of the widespread assumption that the Seventh Amendment guarantees a right to a jury trial on the issue of validity.”).

⁶¹ See *id.* at 655 (“Today, district courts regularly entertain motions for summary judgment on validity issues. . . .”); John R. Allison, Mark A. Lemley, & David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769, 1783 (2014) (“[C]laim construction is the most likely form of substantive ruling in a patent case because it is a prerequisite to virtually any type of summary judgment motion on validity or infringement.”).

⁶² *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

⁶³ DAVID F. HERR, ANN. MANUAL FOR COMPLEX LITIG. § 33.221 (4th ed. 2024).

⁶⁴ *Id.* (“The degree of ambiguity notwithstanding, the court has the discretion to consider both intrinsic and extrinsic evidence, including expert testimony, in interpreting the claims.”).

⁶⁵ *Markman*, 517 U.S. at 388 (“The construction of written instruments is one of those things that judges often do and are likely to do better than jurors unburdened by training in exegesis.”).

⁶⁶ See Allison & Ouellette, *supra* note 54, at 658; Gugliuzza, *supra* note 10, at 640.

⁶⁷ HERR, *supra* note 63, at § 33.221. Additionally, underlying factual disputes have been differentiated from the issue of indefiniteness on appeal. See *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517–18 (Fed. Cir. 2012).

⁶⁸ Allison & Ouellette, *supra* note 54, at 658. While some judges re-analyze the validity challenge brought earlier in litigation, other judges wait for a party to file a motion for summary judgment. *Id.*

indefiniteness, the decision is reviewed *de novo* by an appellate court.⁶⁹ Alleged infringers who raise indefiniteness at the summary judgment stage, but not at trial, do not waive their right to appeal.⁷⁰ Both the procedure of district courts making decisions simultaneous with claim construction and the precedent from the Federal Circuit, such as explicitly stating indefiniteness is a matter of law,⁷¹ indicate that indefiniteness challenges are matters of law under the exclusive privy of the court. Thus, although the Federal Circuit has ostensibly approved of allowing juries to determine indefiniteness,⁷² the extensive majority of judges determine invalidated patents for indefiniteness through summary judgment, bench trials, and post-trial motions.⁷³

Case law does not provide a solution to the fact-law distinction. The Federal Circuit has held that the definiteness requirement is “intertwined” with general claim construction principles, which are reviewed *de novo* at the appellate level as a matter of law.⁷⁴ Further, indefiniteness has been held to be a question of law that is reviewed *de novo*.⁷⁵ Based on this precedence, indefiniteness should be a legal question determined by a judge. Yet, other decisions by the Federal Circuit have muddled the fact-law distinction by altering the legal question to a predominately factual dispute.⁷⁶ The only conclusion that accounts for the breadth of case law and the allowance of determinations by both judge and jury is the third, and final, approach: that validity challenges under indefiniteness are questions of law with underlying questions of fact.

Supreme Court precedent supports the conclusion that validity is a mixed question of law and fact, as the Court has held that “[w]hile patent validity is a question of law, the same factual questions underlying the [United States Patent and Trademark Office]’s original examination of a patent application will also bear on an

⁶⁹ *ePlus*, 700 F.3d at 516.

⁷⁰ *See id.* at 517–18.

⁷¹ *See Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1319 (Fed. Cir. 2008) (“Indefiniteness, like claim construction, is a question of law . . .”).

⁷² *See Gugliuzza, supra* note 24, at 654 (citing *See, e.g., Koninklijke Philips N.V. v. Zoll Med. Corp.*, 656 F. App’x 504, 527–28 (Fed. Cir. 2016); *see also BJ Servs. Co. v. Halliburton Energy Servs., Inc.*, 338 F.3d 1368, 1372 (Fed. Cir. 2003) (“[D]efiniteness . . . is amenable to resolution by the jury where the issues are factual in nature.”)). *But see Yelderman, supra* note 12, at 854 (finding zero jury verdicts for indefiniteness for a six-and-a-half-year period).

⁷³ *Yelderman, supra* note 12, at 854 (documenting the legal bases for patent invalidations over a six-and-a-half-year period and finding 344 invalidity rulings at the summary judgment/*Markman* stage compared to zero jury verdicts).

⁷⁴ *See Gugliuzza, supra* note 24, at 654.

⁷⁵ *See, e.g., Akzo Nobel Coatings, Inc. v. Dow Chem. Co.*, 811 F.3d 1334, 1343 (Fed. Cir. 2016); *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341 (Fed. Cir. 2015); *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1377 (Fed. Cir. 2015); *ePlus*, 700 F.3d at 516; *But see Bombardier Recreational Prods., Inc. v. Arctic Cat, Inc.*, 785 F. App’x 858, 866–60 (Fed. Cir. 2019).

⁷⁶ *See Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1130 (Fed. Cir. 2018) (Reyna, J., concurring in part) (disagreeing with the majority opinion because the majority “attempt[ed] to shift the character of the § 101 inquiry from a legal question to a predominately factual interpretation.”); *Berkheimer v. HP, Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018) (recognizing that when determining patent eligibility, found to be a matter of law, that the inquiry may overlap “with other fact-intensive inquiries like novelty under § 102.”).

invalidity defense in an infringement action.”⁷⁷ In other words, although there are underlying factual disputes, the review of patent validity remains a question of law.

When reframed to questions of law with underlying factual disputes, the confusion starts to dissipate.⁷⁸ For instance, Paul Gugliuzza argues a need for the doctrinal change to treat patent validity as a mixed question of fact and law.⁷⁹ He argues this change would answer questions about what validity issues can be resolved at the pleading stage, who decides them, and further clarifies appellate review.⁸⁰

In the case of indefiniteness, Gugliuzza suggests that cases could be decided at the pleading stage based on the intrinsic record.⁸¹ But if a judge determines extrinsic evidence is needed, then a final decision should be postponed in favor of resolving the factual dispute.⁸² Thus, the fact-law distinction remains an open question that district court judges must grapple with. A solution to resolving the fact-law issues in the indefiniteness issues under both the current jurisprudence and Gugliuzza’s proposed doctrinal change includes minimizing the factual disputes in the analysis. If a court can simplify the analysis, it is left with only questions of law, which provides similar answers as Gugliuzza’s doctrinal change.

The district court split on considering § 112(f) challenges at the pleading stage is likely because of confusion created from the blurred distinction between fact and law. The fact-law distinction stems from a split in the review of indefiniteness, where (1) some Federal Circuit precedents treat indefiniteness as a matter of fact, decided by juries and (2) other precedent treats indefiniteness as a matter of law, under the exclusive privity of the court. The confusion leads to district court judges delaying decisions regarding means-plus-function indefiniteness issues.⁸³ In the majority of cases, district court judges err on the side of caution and delay a ruling on validity until after a *Markman* hearing.⁸⁴ The court may want to hear any extrinsic evidence presented and would be afforded the opportunity to question an expert or inventor on factual issues.⁸⁵

For these reasons, filing a motion to dismiss to attack a patent’s validity at the pleading stage would be “almost unthinkable.”⁸⁶ The ties between claim construction

⁷⁷ *Microsoft Corp. v. i4i Ltd. P’ship*, 564 U.S. 91, 96–97 (2011) (internal citations omitted).

⁷⁸ *See* Gugliuzza, *supra* note 24, at 648.

⁷⁹ *Id.*

⁸⁰ *Id.* at 651.

⁸¹ *Id.* at 654.

⁸² *Id.* at 655.

⁸³ *See* *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019).

⁸⁴ *See, e.g.,* *Artrip v. Ball Corp.*, No. 1:14CV00014, 2017 WL 3669518, at *6 (W.D. Va. Aug. 24, 2017); *Gebo Cermex USA*, 2019 WL 2330905, at *4; *Audio MPEG, Inc. v. Società Italiana Per Lo Sviluppo Dell’ Elettronica Spa*, No. 2:16-cv-00082-HCM-RJK, 2016 WL 7010947, at *8 (E.D. Va. July 1, 2016).

⁸⁵ HERR, *supra* note 63, at § 33.221.

⁸⁶ Raymond A. Mercado, *Resolving Patent Eligibility and Indefiniteness in Proper Context: Applying Alice and Aristocrat*, 20 VA. J.L. & TECH. 240, 258–59 (2016).

principles and indefiniteness have led to the traditional, “settled” court practice of delaying a determination until a *Markman* hearing.⁸⁷ Many courts utilize the language that the definiteness analysis is “inextricably intertwined with claim construction” when denying a pleading stage motion to dismiss for indefiniteness.⁸⁸

But sometimes a court does entertain an indefiniteness challenge under § 112(f) at the pleading stage.⁸⁹ There are circumstances where patent litigants challenge a patent’s validity at the pleading stage under § 112(f).⁹⁰ In certain situations, decisions can be made prior to a *Markman* hearing, on the pleadings in the pre-discovery stage, with either a motion to dismiss or a motion for judgment on the pleadings.⁹¹ In those cases, a court can make a decision solely on the intrinsic record and find that extrinsic evidence would not alter the outcome.⁹² If a district court is left with the exclusive review of a matter of law, then questions regarding who makes the decision and how the decision is made are resolved, and the final remaining problem is when the court should entertain the challenge.

Therefore, while the fact-law distinction will be present when courts are determining the validity of a patent under § 112(f) at different stages of litigation, the analysis is amendable, allowing the minimization of factual disputes to aid a judge in deciding. Further, an appellate court’s review of the patent claims remains *de novo* because, in certain situations, the underlying factual disputes are irrelevant to the legal issues presented.

C. Current Jurisprudence of 112(f)

District court judges have taken different approaches to validity challenges under § 112(f) at the pleading stage. Traditionally, pleading stage motions to invalidate patents were not common.⁹³ Although the Federal Circuit has reviewed § 112(f) as a matter of law determined by a judge,⁹⁴ motions to dismiss involving indefiniteness

⁸⁷ *Gebo Cermex USA*, 2019 WL 2330905, at *4. (“[T]he settled practice among district courts [is] awaiting determination of indefiniteness arguments until after a *Markman* hearing and claim construction . . .”).

⁸⁸ *See, e.g.*, *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999); *Stuart v. Rust-Oleum Corp.*, 272 F.Supp.3d 1019, 1026–27 (S.D. Ohio 2017) (quoting *Atmel* to determine that analysis of indefiniteness would be premature at the pleading stage); *Blackbird Tech. v. Uber Techs., Inc.*, Nos. 19-561 (MN), 19-566 (MN), 2020 WL 58535, at *8 (D. Del. Jan. 6, 2020) (quoting *Atmel* to deny a motion to dismiss at the pleading stage).

⁸⁹ *See Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *1 (D.N.J. Aug. 30, 2021).

⁹⁰ The current jurisprudence of § 112(f) at the pleading stage is discussed more in-depth later. *See infra* Section II.C.

⁹¹ *See* FED. R. CIV. P. 12(b)(6), (c).

⁹² *See Weinblatt*, 2021 WL 3879132, at *7.

⁹³ Mercado, *supra* note 86, at 258–59. Mercado also states that other traditional defenses entangled with claim construction include anticipation, obviousness, and written description. *Id.*

⁹⁴ *See Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1339 (Fed. Cir. 2015) (“The court explained that ‘when the district court reviews only evidence intrinsic to the patent (the patent claims

issues have been extremely rare,⁹⁵ and findings of invalidity due to indefiniteness at the pleading stage have been even more scarce.⁹⁶

This Article argues an analytical framework to resolve pre-discovery, pleadings stage motions for invalidity under § 112(f). The framework simplifies any additional potential factual issues that are presented in disputes, similar to how these kinds of issues are resolved in other patent suits. Yet, the breakdown of how a district court judge should balance the necessity of extrinsic evidence and decision on the intrinsic record remained unknown. Review of the current jurisprudence of § 112(f) will allow insight into what courts consider at the pleading stage and how the proposed framework can simplify the analysis.

1. *Validity Arguments Rejected During Pleading Motions*

Patent litigators have attempted to invalidate a patent as indefinite when the patent invokes § 112(f) at the pleading stage but have not been successful.⁹⁷ District courts typically address indefiniteness at the formal claim construction stage or the pre-trial, summary judgment stage.⁹⁸ Judges have been wary of determining the § 112(f) question of law at the pleading stage, favoring waiting until after a *Markman* hearing. District court judges delay decisions because they believe that indefinite defenses are “entangled with claim construction” or raise “complex factual issues.”⁹⁹

An often cited case by alleged infringers is *In re TLI Communications LLC Patent Litigation* (“*In re TLP*”) because the case was dismissed at the pleading stage.¹⁰⁰ In the case, the alleged infringers (“Defendants”) filed a single consolidated motion to dismiss according to the Federal Rule of Civil Procedure 12(b)(6).¹⁰¹ Defendants argued both that the patent was directed toward patent-ineligible subject matter under

and specifications, along with the patent's prosecution history), the judge's determination will amount solely to a determination of law, and the Court of Appeals will review that construction de novo.”) (quoting *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015)); *see also* *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517–18 (Fed. Cir. 2012) (“We also review de novo the district court's decision regarding indefiniteness, as it is a question of law.”).

⁹⁵ Mercado, *supra* note 86, at 258–59.

⁹⁶ Yelderman, *supra* note 12, at 854 (finding that only three patents were found to be indefinite at the pleading stage).

⁹⁷ *See, e.g.*, *Artrip v. Ball Corp.*, No. 1:14CV00014, 2017 WL 3669518, at *5–6 (W.D. Va. Aug. 24, 2017); *Audio MPEG, Inc. v. Società Italiana Per Lo Sviluppo Dell' Elettronica Spa*, No. 2:16-cv-00082-HCM-RJK, 2016 WL 7010947, at *1, *3 (E.D. Va. July 1, 2016); *see also* *Uniloc USA, Inc. v. ABB Ltd.*, No. 6:13-cv-906, 2014 WL 11833262, at *2–3 (E.D. Tex. Aug. 28, 2014) (magistrate report and recommendation); *Secured Structures LLC, v. Alarm Sec. Grp., LLC*, No. 6:14-CV-930, 2016 WL 1253688, at *5 (E.D. Tex. Mar. 10, 2016) (magistrate judge report and recommendation).

⁹⁸ *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019) (“[T]he settled practice among district courts [is] awaiting determination of indefiniteness arguments until after a *Markman* hearing and claim construction.”).

⁹⁹ Mercado, *supra* note 86, at 258–59.

¹⁰⁰ *In re TLI Commc'ns., LLC Pat. Litig.*, 87 F.Supp.3d 773, 804–05 (E.D. Va. 2015).

¹⁰¹ *Id.* at 782. The alleged infringers first tried to institute an *inter partes* review to the Patent Trial and Appeal Board (PTAB). *Id.* at 781. However, the PTAB denied the petitions for *inter partes* review; and the infringement suits were consolidated to the Eastern District of Virginia. *Id.*

§ 101 and that the claim terms were indefinite under § 112(f) because they contained means-plus-function language with no corresponding structure in the specification.¹⁰² In response to the motion, the district court had the parties submit claim construction briefs and then conducted a *Markman* hearing.¹⁰³ After the hearing, the court determined that the motion to dismiss was “ripe for disposition” and found the patent was both ineligible under § 101 and invalid under § 112(f).¹⁰⁴

The case is often cited to show the capability of an early challenge.¹⁰⁵ But the district court decided after a *Markman* hearing and the parties fully briefed the issues, so other district courts proclaim that *In re TLI* is an outlier.¹⁰⁶ In differentiating from *In re TLI*, the courts state that the validity issues were only able to be determined because of the *Markman* hearing.¹⁰⁷

Yet, *In re TLI* shows that a district court has the procedural ability to make a decision at the pleading stage, and decisions to wait until claim construction hearings are not due to procedural obstacles. Courts have the procedural ability to invalidate

¹⁰² *Id.* at 782.

¹⁰³ *Id.* The *Markman* hearing was to take place at the University of Virginia School of Law. *Id.* It was the court’s view that watching a claim construction hearing would be beneficial to students. *Id.* at 782 n.29. It is likely that the *Markman* took place earlier than traditional because of this educational interest, and no other technical, procedural reason was given by the court in its opinion.

¹⁰⁴ *Id.* at 782, 804–05. For claims that are challenged under eligibility challenges, such as § 101, and validity challenges, such as § 112(f), the claims can be dismissed pursuant to the eligibility issues without claim construction, even if the asserted claims invoke § 112(f) by using means-plus-function language. See *Hyper Search LLC v. Facebook, Inc.*, No. 17-1387-CFC-SRF, 2018 WL 6617143, at *5 (D. Del. Dec. 17, 2018) (finding that “[o]ther courts have dismissed infringement suits involving patents with means-plus-function claims on the pleadings based on § 101 eligibility” and “claim construction is not necessary.”).

¹⁰⁵ See *Artrip v. Ball Corp.*, No. 1:14CV00014, 2017 WL 3669518, at *6 (W.D. Va. Aug. 24, 2017) (citing *In re TLI*, 87 F. Supp. 3d. at 782); *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *3 (W.D. Va. May 31, 2019) (quoting *In re TLI*, 87 F. Supp. 3d. at 782); *Audio MPEG, Inc. v. Società Italiana Per Lo Sviluppo Dell’ Elettronica Spa*, No. 2:16-cv-00082-HCM-RJK, 2016 WL 7010947, at *8 (E.D. Va. July 1, 2016).

¹⁰⁶ See *Artrip*, 2017 WL 3669518, at *6 (“Even in the case cited by Ball where the district court decided this question on a motion to dismiss, it did so only in conjunction with formal claim construction.”); *Gebo Cermex USA*, 2019 WL 2330905, at *3 (“One of the few district courts to dismiss claims as indefinite at the Rule 12(b)(6) stage did so in large part because the parties had already ‘fully briefed their positions on the disputed claim terms pursuant to’ *Markman*, and the court had already heard ‘[e]xtensive oral argument’ on the ‘claim term disputes.’”); *Audio MPEG*, 2016 WL 7010947, at *8 (“Indeed, even though this Court in *In re TLI Commc’ns* dismissed claims as indefinite on a Rule 12(b)(6) motion, the parties had already ‘fully briefed their positions on the disputed claim terms pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).”).

¹⁰⁷ *Audio MPEG*, 2016 WL 7010947, at *8 (“[T]he Court FINDS that the more prudent approach is to address indefiniteness either during or after the *Markman* hearing.”); *Gebo Cermex USA*, 2019 WL 2330905, at *4 (“[T]he Court will deny [defendant]’s motion to dismiss as premature at the Rule 12(b)(6) stage.”). However, nothing procedurally prohibits a district court from having a *Markman* hearing earlier in the litigation when an issue is brought. The main argument against a pre-discovery *Markman* is that “both parties must perform some detailed investigation.” Mark Malek, *Markman Exposed: Continuing Problems With Markman Hearings*, 7 UNIV. FLA. J. TECH. L. & POLICY 195, 216 (2002).

patents under indefiniteness at the pleading stage.¹⁰⁸ Motions to dismiss are not denied because of a procedural issue presented to the district courts, but rather because the decisions are influenced by the “settled practice among district courts of awaiting determination of indefiniteness arguments until after a *Markman* hearing” and language from the Federal Circuit that the definiteness analysis is “inextricably intertwined with claim construction.”¹⁰⁹

Many courts do not discuss what substantive benefits are gained from a *Markman* hearing that would not be available to them at the pleading stage. In *Artrip v. Ball Corp.*,¹¹⁰ the Western District of Virginia found that the case was not ripe for a validity decision at the pleading stage because a claim construction hearing had not yet occurred.¹¹¹ Ball filed a motion to dismiss under Rule 12(b)(6) asserting, in part, that five of the six patents are invalid as a matter of law for using means-plus-function language without a proper structure in the patents’ specifications.¹¹² In response, Artrip alleged that the issue of claim validity was premature at the pleadings stage.¹¹³ Even though the court stated that “Ball has made a strong argument in favor of a finding of invalidity,” it ruled that the motion to dismiss was premature.¹¹⁴ Other district courts have made similar determinations, holding that a formal claim construction is required before a decision on indefiniteness pursuant to § 112(f).¹¹⁵ Buried in a footnote, the Western District of Virginia alludes to the availability of “expert testimony and extrinsic evidence *where appropriate*.”¹¹⁶ Yet, similar pre-discovery motions to dismiss are made in related patent cases, where the parties are able to fully brief the important issues and sufficiently perform a detailed investigation.¹¹⁷ In some

¹⁰⁸ See *In re TLI Commc’ns LLC Patent Litig.*, 87 F. Supp. 3d 773, 804–05 (E.D. Va. 2015).

¹⁰⁹ *Gebo Cermex USA*, 2019 WL 2330905, at *4 (quoting *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999)).

¹¹⁰ See generally *Atrip*, 2017 WL 3669518.

¹¹¹ See *id.* at *10.

¹¹² *Id.* at *5.

¹¹³ *Id.* at *6.

¹¹⁴ *Id.*

¹¹⁵ See, e.g., *id.*; *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019); *Audio MPEG, Inc. v. Società Italiana Per Lo Sviluppo Dell’ Elettronica Spa*, No. 2:16-cv-00082-HCM-RJK, 2016 WL 7010947, at *8 (E.D. Va. July 1, 2016); see also *Uniloc USA, Inc. v. ABB Ltd.*, No. 6:13-cv-906, 2014 WL 11833262, at *2–3 (E.D. Tex. Aug. 28, 2014) (magistrate report and recommendation); *Secured Structures LLC, v. Alarm Sec. Grp., LLC*, No. 6:14-CV-930, 2016 WL 1253688, at *5 (E.D. Tex. Mar. 10, 2016).

¹¹⁶ *Gebo Cermex USA*, 2019 WL 2330905, at *3 n.1 (emphasis added). The Federal Rules of Civil Procedure provide a mechanism for considering extrinsic evidence during the pleading stage, giving all parties a “reasonable opportunity to present *all material that is pertinent* to the motion.” FED. R. CIV. P. 12(d) (emphasis added). Thus, the assumed benefits of waiting until a *Markman* hearing can be captured at the pleadings stage by treating a motion under Rule 12(b)(6) or 12(c) as one for summary judgment under Rule 56.

¹¹⁷ See *Cisco Sys., Inc. v. Uniloc USA, Inc.*, 386 F. Supp. 3d 1185, 1192–93 (N.D. Cal. 2019) (“In any event, looking to the disputed terms and proposed constructions as recently briefed in the parties’ joint claim construction brief . . . the Court finds that construction of these terms would not aid or alter the Court’s determination today regarding the subject matter eligibility of the ‘522 patent.”).

cases, extrinsic evidence may be needed. However, in other cases, the intrinsic record may be the only necessity. In the latter situations, delaying a decision based on an assumption that a motion is premature at the pleadings stage only delays the inevitable resolution and increases costs for both parties.

So, instead of reviewing indefiniteness arguments made at the pleading stage, the judges follow the “settled practice” and defer validity determinations to a later date. The delay is not because of a procedural obstacle, but rather because of a substantive tradition taken by the courts. However, as discussed below using a case where a § 112(f) ruling was made on the pleadings, certain patent characteristics display the ability to resolve validity disputes through a pre-discovery motion to dismiss.

2. Case Analysis of Invalidity at the Pleading Stage

The analytical framework to resolve pre-discovery, pleading stage motions for invalidity under § 112(f) applies to cases where the determinations can be made from the intrinsic record alone. A counterargument to the framework is that *all* cases would benefit from extrinsic evidence. This has been the “settled practice” of district courts.¹¹⁸ Yet, *Tobii Technology, Inc. v. Weinblatt* (“*Tobii Tech.*”) displays the type of cases where invalidity under § 112(f) can be determined on the intrinsic record alone.¹¹⁹ In that case, the judge denied a motion to dismiss under § 101 but granted a motion to dismiss under § 112(f),¹²⁰ in direct opposition to the “settled practice” among the district courts.

In *Tobii Tech.*, the alleged infringer, Tobii, initiated suit seeking a declaratory judgment for noninfringement.¹²¹ In response to a counterclaim for infringement, Tobii filed a motion to dismiss according to Rule 12(b)(6) alleging the asserted claims were invalid either under § 101 or § 112(f).¹²² The patent-at-issue related to a technique based on eye motion to detect the level of human interest in response to a visual

District Courts also have considered expert declarations when making such decisions. *See, e.g.*, *Mantissa Corp. v. Ondot Sys., Inc.*, No. 4:15-CV-1133, 2017 WL 3437773, at *5 (S.D. Tex. Aug. 10, 2017) (“The Court informed the parties of its decision to convert the Rule 12(c) motion for judgment on the pleadings into a Rule 56 motion for summary judgment and set deadlines for the parties to file additional briefing.”); *McRO, Inc. v. Namco Bundai Games Am., Inc.*, No. CV 12-10327-GW (FFMx), 2014 WL 4749601, at *10, *13 (C.D. Cal. Sep. 22, 2014) (granting a motion for judgment on the pleadings after considering plaintiff’s expert declaration); *Parus Holdings, Inc. v. Sallie Mae Bank*, 137 F. Supp. 3d 660, 672–74 (D. Del. 2015) (granting a motion to dismiss under § 101 after acknowledging plaintiff’s expert declaration).

¹¹⁸ *Gebo Cermex USA*, 2019 WL 2330905, at *4 (“[T]he settled practice among district courts [is] awaiting determination of indefiniteness arguments until after a *Markman* hearing and claim construction.”).

¹¹⁹ *Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *9 (D.N.J. Aug. 30, 2021).
¹²⁰ *Id.*

¹²¹ Tobii filed a complaint against the inventor and patent holder, Weinblatt, seeking a declaratory judgment that Tobii is not infringing Weinblatt’s patent. *Id.* Then, Weinblatt filed a counterclaim alleging infringement. *Id.* at *1.

¹²² *Id.*

stimulus.¹²³

On the § 101 issue, the district court denied the motion to dismiss.¹²⁴ The court followed the two-step analysis presented in *Alice*,¹²⁵ and determined that when construing the patent claims most favorable to the non-moving party, the asserted claims contained a factual question concerning whether it was directed to an abstract idea.¹²⁶

However, on the § 112(f) issue, Tobii successfully invalidated the claim under § 112(f) at the pleading stage.¹²⁷ The claim element subject to means-plus-function analysis provided for an “[a]pparatus” for monitoring viewer interest that included a “means” with at least three functional elements: (1) “displaying” two signals; (2) displaying said signals “together and simultaneously” (3) indicating the viewer’s interest in the visual stimuli.¹²⁸

The parties agreed that the claim used means-plus-function language,¹²⁹ but the parties disputed whether there was an adequate structure enclosed in the specification for the claimed function.¹³⁰ Tobii argued that the structure disclosed in the specification included a display processor, a display circuit, and a video display.¹³¹ The patent holder, Weinblatt, contended the video circuit and video display were the only components of the corresponding structure.¹³² The court agreed with Tobii because the display processor was the only component capable of completing the third function, indicating the viewer’s interest in the visual stimuli.¹³³ While both the circuit and video display were well-known structures, the display processor needed something more because it was “a general-purpose microprocessor that cannot perform the Claimed Function without special programming.”¹³⁴ Tobii argued the claim is indefinite under § 112(f).¹³⁵ The district court agreed because “the description ‘[s]imply disclos[es] a black box that performs the recited function,’ which ‘is not a sufficient

¹²³ *See id.*; U.S. Patent No. 7,641,341 col. 1 l. 15–21 (filed May 10, 2007) (issued Jan. 5, 2010).

¹²⁴ *Weinblatt*, 2021 WL 3879132, at *2–3.

¹²⁵ *See Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 217–18 (2014).

¹²⁶ *Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *4 (D.N.J. Aug. 30, 2021). The factual dispute hinged on whether a human could perform the claimed activity with a pen-to-paper; the court denied the motion as it related to § 101. *Id.* at *4–5.

¹²⁷ *Id.* at *9. The claims at issue also included all dependent claims thereof, which were also found to be invalid based on the invalidity of the independent claim. *Id.*

¹²⁸ *Id.* at *6. The entire claim element provides for an “[a]pparatus for providing an indication of viewer interest in response to visual stimuli, comprising: . . . means for displaying the visual stimuli together with the monitored saccadic eye motion that occurred while the viewer was being exposed to the visual stimuli as an indication of the viewer’s interest in such visual stimuli.” Patent No. 7,641,341 col. 6 l. 58–67 (filed May 10, 2007) (issued Jan. 5, 2010).

¹²⁹ *Weinblatt*, 2021 WL 3879132, at *5. The patentee did not dispute that § 112(f) was invoked, deciding not to argue the first step of the analysis was not met. *See id.* *See* discussion *supra* pp. 233–34 (describing when § 112(f) is “invoked”).

¹³⁰ *Weinblatt*, 2021 WL 3879132, at *5.

¹³¹ *Id.* at *6.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ *Id.* at *7.

¹³⁵ *Id.*

explanation of the algorithm required to render the means-plus-function term definite.”¹³⁶ Thus, the claim was invalid.¹³⁷

Similar to the patent holders in the other early validity challenges, Weinblatt argued that the issue of whether a person having ordinary skill in the art (“PHOSITA”) would identify a corresponding structure to the limitation as being sufficiently definite “are issues inappropriate for resolution at the pleading stage.”¹³⁸ Weinblatt further argued these issues “should be decided as part of the claim construction process with expert testimony.”¹³⁹ Yet, the court disagreed.¹⁴⁰ The court found that it was undisputed that the algorithm disclosure requirement was triggered and, because no algorithm was disclosed, the claim was invalid as indefinite.¹⁴¹ Use of expert testimony was “irrelevant” because parties cannot rely on an expert in the absence of a required disclosure.¹⁴² Accordingly, the court asserted that it is “not required to actually consider the parties’ expert testimony, if any.”¹⁴³ Therefore, the claim-at-issue was found to be invalid pursuant to § 112(f) without a claim construction hearing.¹⁴⁴

The situation presented in *Tobii Tech.* shows that indefinite challenges of means-plus-function claims can be successful at the pleading stage without reliance on traditional, “settled” court practices. The case also exhibits the requisite intrinsic record to make such a determination. The next Section discusses the framework courts can follow to simplify the analysis and resolve patent litigation at the pre-discovery, pre-*Markman* hearing stage.

III. Determining Pleadings Stage Challenges

In this Section, I provide an analytical framework for resolving § 112(f) challenges at the pleading stage. I also argue that the framework is not a novel concept to district court judges, as they have participated in similar analyses under 35 U.S.C. § 101. The framework is limited to “bad patents”—patents that have slipped through the cracks at the United States Patent and Trademark Office (“USPTO”) with invalid claims.¹⁴⁵ For these conventionally bad patents, the pleading stage is the appropriate

¹³⁶ *Id.* at *8 (quoting *Augme Techs., Inc. v. Yahoo! Inc.*, 755 F.3d 1328, 1338 (Fed. Cir. 2014)).

¹³⁷ *Id.* at *9.

¹³⁸ *Id.* at *7.

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.* at *8–9.

¹⁴² *See id.* at *9 (citing *Fortinet, Inc. v. Sophos, Inc.*, No. 13-5831, 2015 WL 6513655, at *8 (N.D. Cal. Oct. 28, 2015)).

¹⁴³ *Id.* (internal quotations omitted).

¹⁴⁴ *Id.*

¹⁴⁵ *See* Michael D. Frakes & Melissa F. Wasserman, *Does the U.S. Patent and Trademark Office Grant Too Many Bad Patents?: Evidence From a Quasi-Experiment*, 67 STAN. L. REV. 613, 619 (2015) (discussing different reasons why the USPTO issues potentially invalid patents, displaying the cracks in the system). There is a general understanding that the United States Patent and Trademark Office issues *many* bad patents. *See id.* at 620–21. Examiners spend an average of *eighteen hours* over two

place for resolution, similar to resolving frivolous claims in other civil litigation at the pleading stage to ensure that accurate decisions are made at the lowest cost possible.¹⁴⁶

A. Framework for Pleading Stage Invalidity Rulings of “Bad Patents” Under § 112(f)

The hesitancy to consider a motion to dismiss at the pleading stage occurs most often when the district court judge determines that the arguments “seem to require claim construction” and that claim construction issues cannot be resolved on the pleadings record alone.¹⁴⁷ Courts choose to deny dismissals on the pleadings without prejudice so the parties can refile the motion after claim construction because the court can “obtain a more complete understanding of the claimed invention.”¹⁴⁸ However, entertaining a motion to dismiss under § 112(f) at the pleading stage does not prohibit denial without prejudice. In some situations, denial of the motion is the appropriate ruling because the court may require further briefing. Yet, when a decision can be made on the intrinsic record, delaying a ruling does not provide any benefit to the court and creates hardship to the alleged infringer.

The framework of § 112(f) challenges can be simplified to get rid of conventionally bad patents by (1) using the “broadest reasonable interpretation” (“BRI”) of the claim language and (2) an “adequacy presumption” for any structure in the specification. “Broadest reasonable interpretation” can be defined as the analysis used at the USPTO, where examiners “appl[y] to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art,” and limits the language by any definitions provided in the written description of the patent application.¹⁴⁹ Typically, the USPTO examines means-plus-function language in the same manner as courts.¹⁵⁰ While courts have the advantage of a fully developed prosecution record, “no distinction is made in [§ 112(f)] between prosecution in the USPTO and enforcement in the courts.”¹⁵¹ So, when means-plus-function language arises, courts’ analysis can reflect

to three years reading the application, searching for relevant prior art, reading the prior art, deciding the validity of the application, and writing an “Office Action” explaining why the application may be lacking. Mark Lemley, *Rational Ignorance at the Patent Office*, 95 NW. UNIV. L. REV. 1495, 1499 (2001).

¹⁴⁶ See *Rotolo v. Borough of Charleroi*, 532 F.2d 920, 922 (3d Cir. 1976) (citing *Valley v. Maule*, 297 F. Supp. 958, 960 (D. Conn. 1968)). There exists an important public policy to “weed out the frivolous and insubstantial cases at an early stage of litigation.” *Id.* Patent litigation maintains the same public policy benefits. See *infra* Section IV.C.

¹⁴⁷ See *Blackbird Tech. v. Uber Techs., Inc.*, Nos. 19-561 (MN), 19-566 (MN), 2020 WL 58535, at *8 (D. Del. Jan. 6, 2020).

¹⁴⁸ *Secured Structures LLC, v. Alarm Sec. Grp., LLC*, No. 6:14-CV-930, 2016 WL 1253688, at *5 (E.D. Tex. Mar. 10, 2016) (magistrate judge report and recommendation).

¹⁴⁹ *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

¹⁵⁰ See *id.* at 1053–54; MPEP § 2111 (9th ed. Rev. 7, Feb. 2023).

¹⁵¹ See *In re Donaldson Co., Inc.*, 16 F.3d 1189, 1193 (Fed. Cir. 1994).

that of an examiner.¹⁵²

BRI is used to determine if there is a structure, material, or act described in the specification as performing the entire claimed function.¹⁵³ When construing the function of a means-plus-function claim as broadly as possible, only the patent claims that have a total absence of an adequate structure described in the specification, prosecution history, or in a patent's record are incapable of surviving a motion to dismiss.¹⁵⁴

Therefore, a new two-step analysis of means-plus-function claims with BRI and an "adequacy presumption" for any structure in the specification properly balances the interest in the presumption of validity and reducing the time and cost of challenging overbroad claims that damage the patent system. By adopting a new analysis, courts will be able to entertain a motion to dismiss at the pleading stage, prior to a *Markman* hearing.

1. *Step 1: Whether § 112(f) Is Invoked Remains Unchanged*

Initially, the first step of the means-plus-function analysis, whether or not § 112(f) is invoked, remains unchanged. Regarding the application of means-plus-function statutory provisions, the Federal Circuit has made clear that the district court's determinations "based on *evidence intrinsic to the patent*" and "its ultimate interpretations of the patent claims" are legal questions.¹⁵⁵ A claim is subject to the application of means-plus-function claiming based solely on the intrinsic record, even when there is competing extrinsic evidence.¹⁵⁶ When a determination on patent validity can be made on the intrinsic evidence alone, there is no need for a district court to wait until a *Markman* hearing to decide whether the claims are subject to § 112(f).

Furthermore, "[a]lthough many of the district courts . . . rendered their indefiniteness decisions either after or concurrently with the claim construction phase of the litigation, those decisions typically do not invoke or rely upon claim constructions."¹⁵⁷ For example, in the *Markman* hearing in *Williamson v. Citrix Online, LLC*, the district court was tasked with construing a multitude of claims, two of which were disputed means-plus-function terms.¹⁵⁸ Solely on the intrinsic record, the court

¹⁵² *See id.*

¹⁵³ MPEP § 2181 (9th ed. Rev. 7, Feb. 2023).

¹⁵⁴ *See Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *7 (D.N.J. Aug. 30, 2021) (finding a claim invalid at the pleadings stage because the patent failed to describe "any algorithm in any form accompanying or explaining the Claimed Function.").

¹⁵⁵ *Williamson II*, 792 F.3d 1339, 1346 (Fed. Cir. 2015).

¹⁵⁶ *See Diebold Nixdorf, Inc. v. Int'l Trade Comm'n*, 899 F.3d 1291, 1299–1300 (Fed. Cir. 2018).

¹⁵⁷ *Intellect Wireless, Inc. v. Kyocera Comm'ns, Inc.*, No. 08-C-1350, 2009 WL 3259996, at *3 (N.D. Ill. Oct. 8, 2009).

¹⁵⁸ *Williamson v. Citrix Online, LLC (Williamson I)*, No. CV11-02409 AHM (JEMx), 2012 WL 12506871, at *12–14 (C.D. Cal. Sept. 4, 2012). The means-plus-function terms appeared in Claim 8 of the challenged '840 Patent as follows:

a *streaming data module* for providing the streaming data from the remote streaming data source selected with the content selection control to the presenter and audience

determined whether the means-plus-function statute was invoked, construed the claim language, and concluded that one of the two disputed terms was indefinite.¹⁵⁹

Additionally, the alleged infringer had to overcome the presumption that the means-plus-function statute section was not invoked because the claim language did not use the term “means,” but rather used a nonce term: “module.”¹⁶⁰ Solely relying on case law and evidence intrinsic to the patent, the court determined that the term “module” did not connote sufficient structure to avoid means-plus-function construction because the syntax used—“a ‘module for [performing a function]’—tracks the language commonly used to describe a means-plus-function term.”¹⁶¹ Moreover, if a presumption is created because the word “means” was lacking from the claim, the Federal Circuit has held that a party advocating for the application of § 112(f) can overcome the presumption created “solely by reference to evidence intrinsic to the patent.”¹⁶²

Analyzing the final prong of whether § 112(f) was invoked,¹⁶³ the Federal Circuit agreed that the disputed term failed to recite a definite structure to modify the meaning of “module.”¹⁶⁴ The proper inquiry by the court in assessing whether the term “module” was “understood by persons of ordinary skill in the art to have a sufficiently definite meaning.”¹⁶⁵ If not, then § 112(f) applies. In affirming the district court, and without use of expert testimony, the Federal Circuit concluded that there was nothing in the specification or prosecution history that provided structural significance to “module.”¹⁶⁶ Thus, while the court could have utilized extrinsic evidence at this stage of litigation, it found the intrinsic record sufficient to rule on the validity of the patent.¹⁶⁷

member computer systems; and
 a *distributed learning control module* for receiving communications transmitted between the presenter and the audience member computer systems and for relaying the communications to an intended receiving computer system and for coordinating the operation of the streaming data module.

Id. at *12 (quoting U.S. Patent No. 6,155,840 col. 11 l. 47–62 (filed Sep. 18, 1998)).

¹⁵⁹ *Williamson II*, 792 F.3d at 1346 (“[T]he district court’s claim construction in this case were based solely on the intrinsic record.”).

¹⁶⁰ *Williamson I*, 2012 WL 12506871, at *12–13.

¹⁶¹ *Id.* at *13. As seen later, the reliance on taking judicial notice of facts in case law has been approved by the Federal Circuit and resolves underlying factual disputes to help district courts with their analysis of pleading stage motions to dismiss. *See* discussion *infra* notes 257–268 and accompanying text.

¹⁶² *Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1300–01 (Fed. Cir. 2018); *see also Williamson I*, 2012 WL 12506871, at *4 (finding extrinsic evidence is “less significant than intrinsic evidence,”) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005)).

¹⁶³ The third prong reviews whether the term used in the first step is modified by sufficient structure, material, or act. *See* discussion *supra* notes 41–42 and accompanying text.

¹⁶⁴ *Williamson II*, 792 F.3d 1339, 1351 (Fed. Cir. 2015).

¹⁶⁵ *Id.* at 1348.

¹⁶⁶ *Id.* at 1350–51.

¹⁶⁷ The court did utilize definitions from technical dictionaries, but it cited another district court case

Based on both the district court and Federal Circuit opinions, it is apparent that the first step of the analysis—whether the provision is invoked—does not require extrinsic evidence. Instead, a challenger can use evidence intrinsic to the patent (e.g., the ordinary meaning of the claim language, specification, prosecution history) to rebut a presumption against application of § 112(f), and the court can use the same evidence to determine that § 112(f) applies.

2. *Step 2: Broadest Reasonable Interpretation and an “Adequacy Presumption”*

If § 112(f) does apply, the analysis moves to the second step, “whether the specification discloses a sufficient structure that corresponds with the claimed function.”¹⁶⁸ The second step has two pertinent questions: (1) what is the function claimed in that element? and (2) does the specification have a structure corresponding to that function?¹⁶⁹ If multiple functions are claimed, there must be adequate corresponding structures to perform all of the functions.¹⁷⁰

Under this standard, if the claims are ambiguous, the broadest reading of the claims should be favored because it will provide the highest likelihood of surviving a motion to dismiss as there will be a greater possibility of the specification containing a structure capable of accomplishing said function. Utilizing the BRI provides the broadest reading and involves giving words of the claim their plain meaning, which is the ordinary and customary meaning at the relevant time of patent prosecution.¹⁷¹

By contrast, during court proceedings involving infringement and validity, claims are typically not given the broadest reasonable interpretation because claims are interpreted based on the fully developed prosecution record.¹⁷² Use of BRI does not restrict a court’s use of the fully developed prosecution record at the pleading stage; a district court can use the prosecution history to aid in determining the broadest scope of the functional element in the claim language. Importantly, BRI is *not* the broadest *possible* interpretation, but rather the broadest *reasonable* interpretation—the most reasonable outside bounds of the scope of the patent claim.¹⁷³ Thus, the court can identify an expanded scope for the claimed function.

Next, after the function is established, determining whether there is a structure oftentimes utilizes expert witnesses to provide the knowledge and perspective of a person having ordinary skill in the art. Under § 112(f), “if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim, a means-plus-function clause is

instead of extrinsic evidence provided by the parties. *Williamson I*, No. CV11-02409 AHM (JEMx), 2012 WL 12506871, at *4. (C.D. Cal. Sept. 4, 2012).

¹⁶⁸ *Williamson II*, 792 F.3d at 1351.

¹⁶⁹ *Id.*

¹⁷⁰ *Id.* at 1351–52.

¹⁷¹ See MPEP § 2111 (9th ed. Rev. 7, Feb. 2023).

¹⁷² *Id.*

¹⁷³ See *id.* (citing multiple BRI cases).

indefinite.”¹⁷⁴ Thus, parties use experts to show that (1) structure disclosed in the specification qualifies as a “corresponding structure” and (2) whether the corresponding structure is “adequate.”

Expert testimony may provide if a structure qualifies as a “corresponding structure”—a structure that is linked or associated with the function recited in the claim element.¹⁷⁵ Yet, under the argued framework, there would be no requirement to use an expert witness to develop the understanding of a PHOSITA.¹⁷⁶ Further, the Federal Circuit has stated that a court makes this determination using the intrinsic record.¹⁷⁷ Thus, intrinsic evidence can be used to determine what these outside bounds are for the functional claim language and can determine if there is a structure that is linked to or associated with the broader function. The use of BRI expands the scope of the functional language to allow the court to not require the use of an expert because by expanding the function to the widest reasonable breadth, the possibility of the patent having a structure disclosed in the specification that is capable of accomplishing said function increases.

The most likely reason a party uses an expert is to determine whether a structure is “adequate” to achieve the claimed function.¹⁷⁸ Thus, the next step of the analytical framework requires an “adequacy presumption”—a presumption that if a structure is capable of accomplishing a function, then it is presumed that the structure will be “adequate.”¹⁷⁹ The presumption can be rebutted.¹⁸⁰

If a structure in the specification is capable of accomplishing the functional

¹⁷⁴ *Williamson II*, 792 F.3d 1339, 1352 (Fed. Cir. 2015).

¹⁷⁵ *Id.*

¹⁷⁶ However, a court is capable of considering expert testimony by converting the motion to one for summary judgment. *See* FED. R. CIV. P. 12(d). Some district courts have entertained expert testimony at the early pleadings stage to grant motions on the pleadings or to convert motions to dismiss to one of summary judgment. *See* Mercado, *supra* note 86, at 327 n.294 (citing a collection of cases).

¹⁷⁷ *Williamson II*, 792 F.3d at 1352 (“Structure disclosed in the specification qualifies as ‘corresponding structure’ if the *intrinsic evidence* clearly links or associates that structure to the function recited in the claim.” (emphasis added)).

¹⁷⁸ *Id.* (“Even if the specification discloses corresponding structure, the disclosure must be of ‘adequate’ corresponding structure to achieve the claimed function.”).

¹⁷⁹ A challenger can rebut the presumption in limited scenarios, such as patents that disclose a general purpose computer—“a general purpose computer programmed to perform particular functions pursuant to instructions from program software”—but require a special purpose computer to accomplish the claimed function. *See id.* In such cases, the structure disclosed in the specification must include an algorithm for performing the claimed function. *Id.* Yet, the analysis is in the light most favorable of the patentee because the algorithm can be found in any kind of expression. *See id.* (“The algorithm may be expressed as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.”). However, with no algorithm at all, the presumption would be rebutted. Thus, the presumption that *any* structure is “adequate” would not apply in situations such as this.

¹⁸⁰ For example, if the only structure contained in the specification is clearly a general-purpose computer, and the determined function requires a special purpose computer, then the “adequacy presumption” can properly be rebutted. *See id.* at 1354 (requiring further description of a special-purpose computer for the claimed function).

language using BRI, or if an expert is needed to determine this step, then the motion to dismiss should be denied and the case should move forward. However, if there is a total absence of a significant structure in the patent, then an expert would be unable to “create [a] structure where none otherwise exists.”¹⁸¹ Moreover, when structure is absent in the specification, expert testimony is prohibited as “a direct consequence of the requirement that the specification adequately discloses corresponding structure.”¹⁸²

Therefore, the framework uses the intrinsic record to determine if § 112(f) is invoked, and then uses BRI and an adequacy presumption to determine the validity of the patent. In cases where there is an unrebutted, presumed adequate corresponding structure or where an expert would be required to determine adequacy, the motion to dismiss should be denied. The case moves forward, likely to discovery and a *Markman* hearing. However, in cases where no structure exists that can satisfy any claimed function broadened by the BRI of the claim language, then the means-plus-function claim is invalid under § 112(f). Neither a *Markman* hearing nor expert testimony can resolve the complete absence of a structure.

3. Using the Framework on a Hypothetical, Representative Claim

What would the analysis look like? A simplified, hypothetical example can display how BRI and an adequacy presumption would be used with the specification to eliminate indefinite patents from the patent system.¹⁸³ For example, means-plus-function claiming could include:

“A birdhouse comprising, . . . a means for fastening a bird feeder to the roof of the birdhouse.”

In this example, the language of the claim is invoking § 112(f) by using the term “means.” The use of “means” creates a presumption that § 112(f) is invoked.¹⁸⁴ The second prong analyzes whether the term used in the first step is modified by functional language.¹⁸⁵ The syntax of the claim matches the “means-plus-function” structure as there is “means for” immediately followed by an identifiable function: “fastening a bird feeder to the roof of the birdhouse.”¹⁸⁶ Finally, the “means” is not modified by sufficient structure, material, or act.¹⁸⁷ Therefore, the analysis can move

¹⁸¹ *Id.*

¹⁸² *Id.*

¹⁸³ This analysis would very likely be used most often in the more complex software setting, where the claim language has many functions, but the specification only details a general computer. *See Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *5–8 (D.N.J. Aug. 30, 2021).

¹⁸⁴ MPEP §2181 (9th ed. Rev. 7, Feb. 2023).

¹⁸⁵ *Id.* The language may not use the transition term “for,” but another linking word or phrase. *Id.* Examples of linking phrases include “configured to” or “so that.” *Id.*

¹⁸⁶ *See Williamson I*, No. CV11-02409 AHM (JEMx), 2012 WL 12506871, at *12–14 (C.D. Cal. Sept. 4, 2012) (discussing the syntax of means-plus-function claiming).

¹⁸⁷ *See Seal-Flex, Inc. v. Athletic Track and Ct. Constr.*, 172 F.3d 836, 849 (Fed. Cir. 1999) (Radar, J., concurring) (“Even when a claim element uses language that generally falls under the step-plus-

to the next step.

When a court determines the function claimed in the element at issue, it will find the broadest reasonable interpretation of the language describing the inventive function. Here, the broadest reasonable reading of the functional language is “to fasten a bird feeder to a birdhouse.” Looking at the intrinsic record, including the meaning of the claim language, the broadest reasonable interpretation would include any structure linked or associated with the function that could accomplish the fastening that is in the specification. First, if the specification links structures such as “nails,” “screws,” or “glue” to the claimed function, then there is at least one “corresponding structure.” Next, when reviewing the adequacy presumption, clearly the presumption is met and is unlikely to be rebutted. Thus, a motion to dismiss under 12(b)(c) challenging the validity of the claim would be denied.

However, not all structures would easily satisfy the requirement. For example, if the specification included “gum” as a structure. Arguably, “gum” is in the reasonable scope of materials capable of fastening a bird feeder to the birdhouse and fully displays the potentially broad scope. Yet, if the specification contained a structure that could be successfully rebutted, then the claim could also be invalidated under this reasoning.¹⁸⁸ Consequently, the “gum” structure likely is rebuttable because gum almost certainly cannot accomplish the requisite adhesive strength to accomplish the fastening function of the claim. If the court delayed for a *Markman*, an expert could not attempt to read in a structure to the specification or claim language because it is prohibited.¹⁸⁹ Thus, the claim would likely be invalid under § 112(f), and the decision can be made at the pleading stage.

Finally, another clear-cut case includes when the specification has no structure capable of “fastening.” Then, the claim is invalid. An expert could try to limit the scope of “fastening” if, for example, was a term of art used in birdhouse construction that had a specified meaning, but limiting the scope would not prevent an indefinite ruling if there were an absolute absence of structure in the specification. By keeping the scope broad, there is a greater chance for a structure in the specification to be linked to the claimed function.

A counterargument may be that there is a specific meaning that is distinct to the birdhouse context that would not be presented to the court until the *Markman* hearing. Yet, when a court uses the BRI at the pleading stage, it avoids, or at least reduces, the risk that there is an interpretation of the claim that will not come out until a *Markman* hearing. Further, because extrinsic evidence is “less significant than intrinsic

function format, however, [35 U.S.C. § 112(f)] still does not apply when the claim limitation itself recites sufficient acts for performing the specified function.”).

¹⁸⁸ But only a rebuttal that includes easily resolved underlying factual disputes should be given weight. See *infra* Section III.B.3 (discussing how underlying factual disputes are not a bar to pleading stage motions). In contrast, actual disputes would require denying the motion to dismiss in favor of a *Markman* hearing.

¹⁸⁹ *Williamson II*, 792 F.3d 1339, 1354 (Fed. Cir. 2015).

evidence in determining the legally operative meaning of claim language” a court can make claim construction determinations exclusively on the intrinsic record.¹⁹⁰ All material the district court would need to make the decision would be in front of the judge at the time of the ruling. Such intrinsic material includes any lexicography in the specification, the prosecution history, and the motion to dismiss response by the non-moving party.

Further, there must be a structure that is clearly linked or associated with the claim element’s functional language within the *intrinsic* evidence presented.¹⁹¹ As discussed earlier, there is a “prohibition against using expert testimony to create structure where none otherwise exists” as “a direct consequence of the requirement that the specification adequately discloses corresponding structure.”¹⁹² Thus, delaying a decision until a *Markman* hearing when a patent does not have *any* structure capable of accomplishing the broadest claim function will not reveal any new information or interpretation to the court.¹⁹³

While a broad claim can be detrimental to a patent holder’s case using other statutory provisions in the Patent Act,¹⁹⁴ broadening the claim is useful to the patent holder in this situation. Under the second step of analysis for § 112(f), the lone goal of the non-moving party is to show that there is a structure disclosed in the specification that can achieve the claimed function.¹⁹⁵ Increasing the breadth of the claim increases the chances that the specification has *any* structure that can presumably accomplish the claimed function.

Further, the presumption that a structure asserted by the patentee in the specification is “adequate” to accomplish the broad function language reflects similar presumptions at the pleading stage in other patent validity cases.¹⁹⁶ Issued patents have a presumption of validity by statute.¹⁹⁷ Additionally, during a motion to dismiss in a civil action, a court is required to construe the complaint in a light most favorable to

¹⁹⁰ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (internal citations omitted); *see also Fenner Invs., Ltd. v. Celco P’ship*, 778 F.3d 1320, 1322 (Fed. Cir. 2015) (“When the district court reviews only evidence intrinsic to the patent . . . , the judge’s determination will amount solely to a determination of law.”).

¹⁹¹ *Williamson II*, 792 F.3d at 1352 (“Structure disclosed in the specification qualifies as ‘corresponding structure’ if the *intrinsic evidence* clearly links or associates that structure to the function recited in the claim.” (emphasis added)).

¹⁹² *Id.* at 1354.

¹⁹³ *See also* discussion *infra* Section III.C (discussing why an overreliance on a *Markman* hearing is misplaced and can do more damage than good for the patent system).

¹⁹⁴ For example, a patentee would not want a broad claim if the alleged infringer has asserted an indefiniteness invalidity defense under § 112(b) because the claim could be found invalid by not disclosing the invention. *See* MPEP § 2173.04 (9th ed. Jan. 2018 Archive) (“[A] claim is indefinite when the boundaries of the protected subject matter are not clearly delineated and the scope is unclear.”).

¹⁹⁵ *See* discussion *supra* pp. 108–09; *supra* notes 43–50 and accompanying text.

¹⁹⁶ *See Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018) (“If there are claim construction disputes at the Rule 12(b)(6) stage, we have held that either the court must proceed by adopting the non-moving party’s constructions.”).

¹⁹⁷ 35 U.S.C. § 282(a).

the plaintiff and accept all factual allegations made in the complaint as true.¹⁹⁸ Meanwhile, a motion to dismiss that includes a challenge to patent validity under § 112(f) by an alleged infringer would require construing the complaint (and thus the patent) in a light most favorable to the party asserting the patent rights.¹⁹⁹ Thus, use of BRI when analyzing means or step-plus-function claims satisfies the presumptions of validity in favor of the non-moving party, the patentee. A patent would be invalid only if there are no structures sufficient to support a patent claim.

In brief, when there is a structure in the specification that can complete the broadest reasonable interpretation of the functional claim language, then the court should deny the motion to dismiss and continue to a *Markman* hearing.²⁰⁰ A motion to dismiss at the pleading stage using § 112(f) should not be granted if there is a genuine factual dispute.²⁰¹ However, in cases where no structure exists that can satisfy any claimed function broadened by the BRI of the claim language, or the adequate structure can be successfully rebutted, then the means-plus-function claim is invalid under § 112(f). Either situation requires a more stringent analysis from the district court for a § 112(f) challenge at the pleading stage.

B. Relating the Proposed Framework to the *Alice* Framework Under § 101

Similar to district courts entertaining challenges to patent eligibility under § 101 at the pleading stage, the courts should entertain challenges to patent validity under § 112(f) early in patent litigation. Since the Supreme Court ruled in *Alice*²⁰² in 2014, district courts have allowed arguments against patent eligibility in pleading stage

¹⁹⁸ See generally *Bell Atl. Corp. v. Twombly*, 550 U.S. 544 (2007); *Ashcroft v. Iqbal*, 556 U.S. 662 (2009).

¹⁹⁹ *Aatrix*, 882 F.3d at 1125. Courts normally interpret *Aatrix* as requiring the review of the factual allegations made in the complaint regarding the claim elements or their combination. See *Blackbird Tech. v. Uber Techs., Inc.*, Nos. 19-561 (MN), 19-566 (MN), 2020 WL 58535, at *6 (D. Del. Jan. 6, 2020). However, there is a concern that patentees could merely draft the complaint in a way that creates an arguable factual allegation. *Id.* (Reyna, C.J., concurring in part) (“First, the majority opinion attempts to shift the character of the § 101 inquiry from a legal question to a predominately factual inquiry.”). Yet, while *Aatrix* does focus on the underlying factual disputes recognized in patent eligibility matters of law, the case “did not preclude addressing patent eligibility on pre-trial motions.” Li Zhang, *Alice Gets a Haircut: Berkheimer and Aatrix Restore Factual Inquiry to Patent Subject Matter Eligibility Under § 101*, 34 BERKELEY TECH. L.J. 1081, 1082 (2019). Similarly, using BRI, a patentee’s attempt to proactively defeat a pleadings motion under § 112(f) would be equally unsuccessful.

²⁰⁰ Determinations denying a 12(b)(6) motion would not be final determinations on the validity of the patent. The merits of both an infringement claim by the patentee and an invalidity defense by the alleged infringer would be determined later in the litigation. See, e.g., *F45 Training Pty. Ltd. v. Body Fit Training USA Inc.*, No. 20-1194-WCB, 2022 WL 17177621, at *19 (D. Del. Nov. 17, 2022) (denying validity argument at the pleadings stage but determining the merits later in litigation).

²⁰¹ See *Aatrix*, 882 F.3d at 1126–27.

²⁰² See *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014).

motions to dismiss.²⁰³ And those arguments have been successful.²⁰⁴ When deciding *Alice*, the Supreme Court implemented an analytical framework for patent eligibility.²⁰⁵ *Alice*'s framework is comparable to the § 112(f) framework argued here, which supports district courts making validity determinations at the pleading stage.

Although district courts are wary of entertaining motions to dismiss at the pleading stage under § 112(f), the analysis for means-plus-function claiming is similar to the patent eligibility analysis under §101, which courts have permitted to be challenged at the pleading stage for almost a decade.²⁰⁶ Unlike early validity challenges, which are practically unheard of,²⁰⁷ patentable subject matter jurisprudence has been on the rise since the ruling of *Alice*.²⁰⁸ Case law related to patent eligibility undoubtedly shows that a court may make a ruling at the pleading stage without first hearing testimony,²⁰⁹ and that claim construction “is not an inviolable prerequisite” to an eligibility determination under § 101.²¹⁰ Meanwhile, means-plus-function claiming has been held—incorrectly—to be “inextricably intertwined” with claim construction.²¹¹ Patent eligibility jurisprudence supports the comparison of the two frameworks.

The *Alice* framework and the § 112(f) framework argued here can be generally described as containing two steps: (1) Identification and (2) Transformation.

1. Identification Step Comparison

First, district courts use the claims' language to identify. The intertextual analysis in step one of the *Alice* framework is similar to the intertextual analysis of § 112(f).

²⁰³ David Bohrer, *Guest Post: In Rush to Invalidate Patents at Pleadings Stage, Are Courts Coloring Outside the Lines?*, PATENTLY-O (July 1, 2015), <https://patentlyo.com/patent/2015/07/invalidate-pleadings-coloring.html>.

²⁰⁴ Brandon Rash et al., *Overlooked Patent Cases: Lessons on Section 101 Motions*, AKIN GUMP (Sept. 22, 2020), <https://www.akingump.com/a/web/mhJ3FnBYSHiXfunVMTFwig/TULi7/law360-overlooked-patent-cases-lessons-on-section-101-motions.pdf> (finding an invalidation rate under Section 101 at the pleading stage of 60% in 2015).

²⁰⁵ *Alice*, 573 U.S. at 217.

²⁰⁶ See, e.g., *Intell. Ventures I, LLC v. Mfrs. and Traders Tr. Co.*, 76 F. Supp. 3d 536, 550 (D. Del. 2014) (granting in part a motion to dismiss because an asserted patent was ineligible under § 101); *Splunk Inc. v. Cribl, Inc.*, 662 F. Supp. 3d 1029, 1051 (N.D. Cal. 2023) (granting motion to dismiss because “all of the patents-in-suit run afoul of Section 101.”); *Personalized Media Commc’n, LLC v. Amazon.com, Inc.*, 161 F. Supp. 3d 325, 338 (D. Del. 2015) (granting a motion for judgment on the pleadings); *Cisco Sys., Inc. v. Uniloc USA, Inc.*, 386 F. Supp. 3d 1185, 1192–93 (C.N.D. Cal. 2019) (granting a motion for judgment on the pleadings).

²⁰⁷ Gugliuzza, *supra* note 10, at 614.

²⁰⁸ Rash et al., *supra* note 204.

²⁰⁹ See, e.g., *Yu v. Apple, Inc.*, 1 F.4th 1040, 1046 (Fed. Cir. 2021); *Genetic Techs. Ltd. v. Merial LLC*, 818 F.3d 1369, 1373–74 (Fed. Cir. 2016).

²¹⁰ *Bancorp Servs. LLC v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1273 (Fed. Cir. 2012).

²¹¹ See, e.g., *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019) (quoting *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999)); *Stuart v. Rust-Oleum Corp.*, 272 F.Supp.3d 1019, 1026–27 (S.D. Ohio 2017) (quoting *Atmel* to determine that analysis of indefiniteness would be premature at the pleading stage); *Blackbird Tech. v. Uber Techs., Inc.*, Nos. 19-561 (MN), 19-566 (MN), 2020 WL 58535, at *8 (D. Del. Jan. 6, 2020) (quoting *Atmel* to deny a motion to dismiss at the pleading stage).

In *Alice*, the Supreme Court established that a court must determine whether the claims at issue are directed to patent-ineligible concepts, such as laws of nature, natural phenomena, and abstract ideas.²¹² In doing so, courts must “consider the elements of each claim both individually” and “as an ordered combination.”²¹³

For example, in *PlanetID, LLC v. Digify, Inc.* (“*PlanetID*”), the District Court for the Northern District of California reviewed the claim language to determine that the asserted claims were directed to an abstract idea.²¹⁴ The court found that certain steps were merely “generic computer-implemented steps.”²¹⁵ Once those steps were stripped away, the only thing left was an abstract idea.²¹⁶ The court did not require claim construction to determine what steps were merely generic computer-implemented steps, but rather did so solely on the language of the claims and the patent’s specification.²¹⁷

Meanwhile, under § 112(f), a court is tasked with identifying whether the claim at issue invokes a means-plus-function analysis.²¹⁸ Determining whether § 112(f) applies requires using the patent claim language, including the syntax of the claim.²¹⁹ A court identifies whether the disputed limitation is written in means-plus-function format or whether the use of the term “means” or an equivalent nonce term with a functional claim language.²²⁰

In the same *PlanetID* patent eligibility case, the patent holder argued there was a claim construction dispute that prevented the court from determining eligibility at the pleading stage because the claims had to be interpreted under § 112(f).²²¹ However, the court disagreed because the patent holder failed to show § 112(f) applied.²²² The court made a determination based solely on the language of the claim and the intrinsic record to show that § 112(f) did not apply, and there was no existing claim construction dispute to bar a conclusion.²²³

²¹² *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014).

²¹³ *Id.*

²¹⁴ *PlanetID, LLC v. Digify, Inc.*, No. 19-cv-04615-JST, 2021 WL 567371, at *4 (N.D. Cal. Jan. 12, 2021).

²¹⁵ *Id.* at *5.

²¹⁶ *Id.*

²¹⁷ *See id.* at *5–6.

²¹⁸ *See discussion supra* at notes 31–42.

²¹⁹ *See Williamson I*, No. CV11-02409 AHM (JEMx), 2012 WL 12506871, at *12–14 (C.D. Cal. Sept. 4, 2012) (using the syntax of the claim to show that § 112(f) was invoked).

²²⁰ *See Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1299–1300 (Fed. Cir. 2018) (“[I]n appropriate cases, a party advocating that a claim limitation that does not recite the word ‘means’ is subject to § 112[(f)] can overcome the presumption against its application solely by reference to evidence intrinsic to the patent.”); *see also WSOU Invs. LLC v. Google LLC*, No. 2022-1063, 2023 WL 6889033, at *2–3 (Fed. Cir. Oct. 19, 2023).

²²¹ *PlanetID, LLC v. Digify, Inc.*, No. 19-cv-04615-JST, 2021 WL 567371, at *9 (N.D. Cal. Jan. 12, 2021).

²²² *Id.*

²²³ *Id.*

Therefore, both the proposed framework of this Article and the *Alice* framework require an “identification” determination by the court using the intrinsic record of the patent.

2. Transformation Step Comparison

Second, both frameworks utilize a “transformation” step. Under § 101, district courts use intrinsic evidence to determine if the patent contains evidence of an inventive concept to transform a patent-ineligible concept into an eligible concept. The Supreme Court implemented a second prong in *Alice* to “examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claim[]...”²²⁴ In doing so, the claim language of the representative method claim had to be evaluated to determine the function that was to be performed.²²⁵ The patent’s specification may provide additional guidance to describe the detail needed to transform the abstract idea into something eligible.²²⁶ In *Alice*, the Court found that the functions performed in each claimed element were “purely conventional” computer functions, and determined there was not enough to transform the abstract idea into a patent-eligible invention.²²⁷ The analytical framework of § 101 requires an interpretation of the language and scope of the patent’s claim. By definition, in eligibility challenges, district courts implement a form of claim construction.²²⁸

Comparatively, a district court under § 112(f) reviews the specification to transform “means” into an adequate corresponding structure. Initially, the district court interprets the claim element’s functional language.²²⁹ Then, once the function of the claim is determined, the court turns its focus to the specification to determine if there is an adequate corresponding structure disclosed. Similar to a court reviewing the claim elements and the specification to determine whether there is an inventive step in the claim element to transform a claim directed to a patent ineligible subject in § 101 challenges, a court must review the claim elements and the specification to describe a corresponding structure needed to adequately perform the element’s function in a § 112(f) challenge.²³⁰ Means-plus-function challenges require equally minimal claim construction as a patent eligibility analysis.

In patent eligibility challenges, the court partakes in a form of claim construction. For example, while in district court, the patentee in *Hawk Technology Systems, LLC v. Castle Retail, LLC* argued the construction of the meaning of the term “parameters” at the hearing.²³¹ The district court used the information presented at the

²²⁴ *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 221 (2014).

²²⁵ *See id.* at 225–26.

²²⁶ *See Yu v. Apple, Inc.*, 1 F.4th 1040, 1045 (Fed. Cir. 2021).

²²⁷ *Alice*, 573 U.S. at 225–26.

²²⁸ *See discussion infra* notes 231–242 and accompanying text.

²²⁹ *See Williamson II*, 792 F.3d 1339, 1351 (Fed. Cir. 2015).

²³⁰ *Id.*

²³¹ *Hawk Tech. Sys., LLC v. Castle Retail, LLC*, No. 2:20-cv-02766-JPM-tmp, 2021 WL 5832793, at *4 (W.D. Tenn. Sept. 15, 2021), *aff’d*, 60 F.4th 1349 (Fed. Cir. 2023).

hearing and the ordinary meaning of the words to determine that the “temporal and spatial parameters” claimed by the patentee were similar to “image data manipulation” claimed in a related, precedential case.²³² Based on this construction, the claim was found to be patent ineligible.²³³ Subsequently, on appeal, the Federal Circuit looked at the specification to determine that the patentee failed to provide anything that specified what the parameters were.²³⁴ Based on the construction of the claims—finding, at most, that the parameters were concerned with “image formatting and compression”—the patent claims failed step two of *Alice*.²³⁵ Thus, the Federal Circuit approved a type of claim construction in a pleading stage motion to dismiss.

District court judges can adopt claim construction assumptions that do not materially impact the analysis. They can construct claim elements solely on the intrinsic record,²³⁶ accept the non-moving party’s construction, or partake in limited claim construction to resolve the § 101 issue at the pleading stage.²³⁷ For instance, in a pleading stage motion to dismiss under § 101, the patentee argued that the dependent claims at issue recited additional steps and provided for how the claim was to be construed.²³⁸ However, even when construing the claims with the patentee’s construction, the court found that no claim contained a transformative “inventive concept.”²³⁹ Thus, in the patent eligibility context, a court is not required to delay its analysis until claim construction, even when making rulings based on the parties’ construction of a claim.²⁴⁰

Additionally, in *PlanetID*, the court determined that even when reading certain structures described in the specification into the asserted claims in favor of the patent holder, there was no structure present that transformed the claim from an abstract idea to an inventive concept.²⁴¹ While the court can make that decision in a patent eligibility case, courts reviewing patent validity challenges in means-plus-function cases

²³² *Id.*

²³³ *See id.* at *5–6.

²³⁴ *Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1358–59 (Fed. Cir. 2023).

²³⁵ *Id.*

²³⁶ *See Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1300–01 (Fed. Cir. 2018).

²³⁷ *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018) (“If there are claim construction disputes at the Rule 12(b)(6) stage, we have held that either the court must proceed by adopting the non-moving party’s constructions, or the court must resolve the disputes to whatever extent is needed to conduct the § 101 analysis, which may well be less than a full, formal claim construction.”) (internal citations omitted).

²³⁸ *Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1348–49 (Fed. Cir. 2014).

²³⁹ *Id.* at 1349.

²⁴⁰ *See id.*

²⁴¹ *PlanetID, LLC v. Digify, Inc.*, No. 19-cv-04615-JST, 2021 WL 567371, at *9 (N.D. Cal. Jan. 12, 2021). In this case, the claims would likely be invalid under § 112(f) for failure to provide an algorithm that shows *how* a generic computer accomplishes the asserted claim functions. *See Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *6 (D.N.J. Aug. 30, 2021).

have treated very similar disputes as an absolute bar on early resolution.²⁴² Whether determining if the structure claimed in the specification transforms an abstract idea to an inventive concept or transforms “means” into an adequate corresponding structure, the court is analyzing the same terms in relatively similar ways.

A counterargument is that the analysis of § 101 is not a form of claim construction, but a broader overview of what the claim is directed to.²⁴³ It has been argued that “the terminology used in the claim or the length and complexity of the claim do not matter for either part of the *Alice Corp.* test.”²⁴⁴ Courts are required to review the terminology in the claim to determine if there is transformative language.²⁴⁵ Because of this requirement, courts are able to accept the non-moving party’s construction or partake in limited claim construction to resolve potential underlying factual issues.²⁴⁶ While a court can accept that a claim is directed to an abstract idea without any claim construction, examination of the transformative nature of elements requires construing the claims in light of the specification.²⁴⁷

Furthermore, in patent eligibility cases, “a district court is free to require the party asking for construction to provide an actual proposed construction, to demonstrate that its construction is not frivolous, and to articulate how the adoption of the construction would materially impact the analysis.”²⁴⁸ And the court will review “all possible constructions.”²⁴⁹ The Federal Circuit only requires denial of a motion to dismiss in favor of formal claim construction when there are construction issues that will materially impact the analysis.²⁵⁰ Thus, patent eligibility cases can review multiple constructions and determine if the framework will be impacted. But means-plus-function claims do not get similar treatment. District courts faced with a § 112(f) challenge at the pleading stage do not consider “all possible constructions,” but rather deny a motion to dismiss because means-plus-function claiming is “inextricably intertwined” with claim construction. Yet, using the broadest reasonable interpretation standard in a means-plus-function claiming assessment equally involves limited claim construction and the court to review “all possible constructions” when

²⁴² See, e.g., *Artrip v. Ball Corp.*, No. 1:14CV00014, 2017 WL 3669518, at *3 (W.D. Va. Aug. 24, 2017); *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *4 (W.D. Va. May 31, 2019); *Audio MPEG, Inc. v. Società Italiana Per Lo Sviluppo Dell’ Elettronica Spa*, No. 2:16-cv-00082-HCM-RJK, 2016 WL 7010947, at *8 (E.D. Va. July 1, 2016).

²⁴³ See Joseph Saltiel, *In the Courts: Five Years After Alice – Five Lessons Learned From the Treatment of Software Patents In Litigation*, WIPO MAG. (Aug. 2019), https://www.wipo.int/wipo_magazine/en/2019/04/article_0006.html (“Following *Alice*, most courts rely on a characterization of the claims instead of the words used in the claims for their analysis.”).

²⁴⁴ *Id.*

²⁴⁵ *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 221 (2014).

²⁴⁶ *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018); see also discussion *supra* Section III.B.3.

²⁴⁷ See *Aatrix*, 882 F.3d at 1125; *Sanderling Mgmt. Ltd. v. Snap Inc.*, 65 F.4th 698, 704 (Fed. Cir. 2023).

²⁴⁸ *Sanderling Mgmt.*, 65 F.4th at 704.

²⁴⁹ See *id.* (“If claims are directed to ineligible (or eligible) subject matter under all plausible constructions, then the court need not engage in claim construction before resolving a Section 101 motion.”).

²⁵⁰ See *id.*; see also *Aatrix*, 882 F.3d at 1125.

determining the broadest construction of the functional language. While the analytical framework of both § 101 and § 112(f) include tools that allow district courts to make determinations at the pleading stage without formal claim construction, only patent eligibility challenges reap the benefits.

Whether the judicial systems use the “claim construction” term of art, or not, the analysis of both § 101 and § 112(f) require an interpretation of the claim language and the scope of the patent’s claim. By definition, both involve claim construction. The framework of § 112(f) is no more “inextricably intertwined” with claim construction as the § 101 analytical framework.

Because a court is not required to delay its analysis until claim construction under § 101, similarly situated courts under § 112(f) should not delay analysis where a decision can be made on the intrinsic record. Therefore, *Alice* supports district courts making validity determinations at the pleading stage because courts are already entertaining a similar two-step analysis at the pleading stage.

3. “Procedurally Premature”

The main argument presented by patent owners in response to a pleading stage challenge to a patent’s validity is that the motion is “procedurally premature”—a decision cannot be made without formal claim construction.²⁵¹ Patent holders further argue that a district court *must* consider extrinsic evidence to decide.²⁵² But the argument will fail if a court can make a ruling solely on the intrinsic record.²⁵³ If a court cannot make a ruling without formal claim construction, then the motion should properly be denied. However, courts are permitted to resolve underlying factual disputes through a plethora of different resources, such as limited claim construction²⁵⁴ or acceptance of extrinsic historical observations and judicial notice.²⁵⁵ District courts have been provided these tools to remove underlying factual disputes, which allow for patent lawsuits to be disposed of in the early stages of litigation by using evidence outside of the intrinsic record.

²⁵¹ See, e.g., *Stuart v. Rust-Oleum Corp.*, 272 F.Supp.3d 1019, 1025 (S.D. Ohio 2017) (“In response, Plaintiff argues that Defendants’ motion is premature as indefiniteness is a matter to be determined at claim construction.”); *Lite-Netics, LLC v. Nu Tsai Cap. LLC*, 678 F. Supp. 3d 1115, 1129 (D. Neb. 2023) (“Lite-Netics argues that it is premature to decide whether the claims of the Asserted Patents are indefinite because the Court has not yet conducted a Markman hearing to determine claim construction.”); *Gebo Cermex USA, Inc. v. Alliance Indus. Corp.*, No. 6:18-cv-00080, 2019 WL 2330905, at *3 (W.D. Va. May 31, 2019) (“Gebo contends that it would be premature to dismiss the case on indefiniteness grounds at the Rule 12(b)(6) stage, since claim construction and a *Markman* hearing have not yet taken place.”).

²⁵² See, e.g., *Tobii Tech., Inc. v. Weinblatt*, No. 2:20-cv-08062, 2021 WL 3879132, at *7 (D.N.J. Aug. 30, 2021) (stating that the patentee argued that determination of corresponding structure “should be decided as part of the claim construction process with expert testimony.”).

²⁵³ See *Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1359–60 (Fed. Cir. 2023) (finding a court looking at extrinsic evidence improper, but a harmless error).

²⁵⁴ *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018).

²⁵⁵ *Bohrer*, *supra* note 203; see also *Zhang*, *supra* note 199, at 1102 (Table 1 displays examples of “judicially noticed facts.”).

As an initial rule, at the pleading stage, a district court should not look at any extrinsic evidence.²⁵⁶ However, oftentimes, courts “color outside the lines” to consider extrinsic evidence in motions to dismiss.²⁵⁷ One such way is through taking judicial notice of factual decisions made in other cases.²⁵⁸ “Judicial notice” permits a judge to resolve factual issues without requiring formal proof.²⁵⁹ A court may take judicial notice of indisputable facts, which may include scientific and technical principles.²⁶⁰

Yet, the Federal Rules of Evidence merely require that the facts not be subject to “reasonable dispute.”²⁶¹ So, there are cases where judicial notice is taken, and a party believes there is reasonable room for argument. Courts differ on what degree of unanimity is required to take notice, where some put greater emphasis on expert opinions and others have lower thresholds to accept a fact under the notice power.²⁶² When judges have lower thresholds, lawyers have a powerful tool to shape the issue and limit costs.²⁶³

In patent eligibility cases, courts have taken judicial notice of evidence that parties find arguable, such as “general historical observations” of “long-standing commercial practices.”²⁶⁴ A court may take judicial notice of another court’s opinion in a

²⁵⁶ See FED. R. CIV. P. 12(d) (“If, on a motion under Rule 12(b)(6) or 12(c), matters outside the pleadings are presented to and not excluded by the court, the motion must be treated as one for summary judgment.”). The use of extrinsic evidence is harmless error if the use of the evidence is for an underlying factual dispute immaterial to an issue as a matter of law. *Hawk Tech. Sys.*, 60 F.4th at 1360. For example, the patentee in *Hawk Technology Systems, LLC v. Castle Retain, LLC* argued that the motion was procedurally premature under Rule 12 and improperly decided because the district court considered extrinsic evidence. *Id.* at 1359. The district court was presented with a Power-Point discussing two prior art references and a report after a technical briefing. *Id.* After the Federal Circuit found that reliance on extrinsic evidence was in error, it found the error to be harmless because the dismissal was justified without reference to any extraneous materials. *Id.* at 1360. Thus, underlying factual disputes may be immaterial to the matter of law determination by the district court. *See id.*

²⁵⁷ Zhang, *supra* note 199, at 1102; Bohrer, *supra* note 203.

²⁵⁸ See *Judicial Notice*, BLACK’S LAW DICTIONARY (12th ed. 2024) (“A court’s acceptance, for purposes of convenience and without requiring a party’s proof, of a well-known and indisputable fact . . .”).

²⁵⁹ *Id.*; Christopher Onstott, *Judicial Notice and the Law’s “Scientific” Search for Truth*, 40 AKRON L. REV. 465, 470 (2007).

²⁶⁰ See Onstott, *supra* note 259, at 470–71.

²⁶¹ Paul J. Kiernan, *Better Living Though Judicial Notice*, 36 LITIG. 1, 2 (2009).

²⁶² Onstott, *supra* note 259, at 474–75.

²⁶³ See Kiernan, *supra* note 261, at 1.

²⁶⁴ *Affinity Labs of Tex., LLC v. Amazon.com, Inc.*, No. 6:15–CV–0029–WSS–JCM, 2015 WL 3757497, at *8 (W.D. Tex. June 12, 2015) (“The above examples represent just a few of the many general historical observations that come to mind as evidence of the long-standing commercial practice of delivering selectable media content and subsequently playing the selected content on a portable device.”); see also *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1373 (Fed. Cir. 2020) (“It is within the trial court’s discretion whether to take judicial notice of a longstanding practice where there is no evidence of such practice in the intrinsic record.”); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362 (Fed. Cir. 2015) (“Our review is generally limited to the face of the complaint, materials incorporated into the complaint by reference, and matters of judicial notice.”) (internal quotations omitted).

ruling, but district courts have taken this a step further and accepted factual findings made in other decisions as truth.²⁶⁵ A judicially noticed fact can even be a critical fact in a case.²⁶⁶ Relying on factual findings made in other decisions is arguably outside of the scope of what may be judicially noticed in a motion to dismiss.²⁶⁷ But the Federal Circuit has approved of this tactic.²⁶⁸ When a court takes notice, underlying facts are determined conveniently and efficiently without a formal *Markman* hearing.

Comparable to district courts taking judicial notice during a pleading stage motion in patent eligibility cases, which has been approved by the Federal Circuit, district courts should take notice of similar facts not in “reasonable dispute” in patent validity pleading motions. For example, a court may take judicial notice of whether a structure in the specification is capable of the claimed function.²⁶⁹ The underlying factual determination required does not bar ruling on a Rule 12(b)(6) motion to dismiss, even when the factual dispute may be critical to the case.²⁷⁰ Judicial notice is one tool to aid with the disposal of patent lawsuits in the early stages of litigation.

Further, the Federal Circuit permitted courts to partake in limited or presumptive claim construction to resolve underlying factual disputes.²⁷¹ Under limited claim construction, district courts review all plausible constructions and determine if the case can be resolved without engaging in formal claim construction.²⁷² Meanwhile, under presumptive claim construction, a court construes the claims in favor of the non-movant before making a final determination.²⁷³

In a motion to dismiss claiming patent ineligibility, a court can use either limited or presumptive claim construction to make a determination as to whether the claims are patent ineligible.²⁷⁴ If the patent does not provide the requisite language to save the claims, then the court finds the claims ineligible.²⁷⁵ While courts have made rulings related to the specification in patent eligibility cases, most courts have been hesitant to entertain similar arguments with means-plus-function claims under § 112(f).²⁷⁶ The same analytical tools utilized by courts at the pleadings stage in patent eligibility cases should be used in patent validity cases under § 112(f).

²⁶⁵ See *Affinity Labs of Tex.*, 2015 WL 3757497, at *8.

²⁶⁶ Kiernan, *supra* note 261, at 2.

²⁶⁷ Bohrer, *supra* note 203.

²⁶⁸ See *CardioNet*, 955 F.3d at 1373; *OIP Techs.*, 788 F.3d at 1364.

²⁶⁹ When there is no actual dispute as to whether a structure in the specification can accomplish the function asserted in the means-plus-function language, it would be inefficient and costly to require formal claim construction just to allow a patentee to argue a far-fetched assertion.

²⁷⁰ Kiernan, *supra* note 261, at 2.

²⁷¹ *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018).

²⁷² See *Sanderling Mgmt. Ltd. v. Snap Inc.*, 65 F.4th 698, 704, 704 n.3 (Fed. Cir. 2023).

²⁷³ See, e.g., *Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1349 (Fed. Cir. 2014); *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350–51 (Fed. Cir. 2016).

²⁷⁴ See, e.g., *Content Extraction & Transmission*, 779 F.3d at 1349; *Bascom*, 827 F.3d at 1350–51.

²⁷⁵ See, e.g., *Content Extraction & Transmission*, 779 F.3d at 1349; *Bascom*, 827 F.3d at 1350–51.

²⁷⁶ *Compare Content Extraction & Transmission*, 779 F.3d at 1349, and *Bascom*, 827 F.3d at 1350–51, with *Artrip v. Ball Corp.*, No. 1:14CV00014, 2017 WL 3669518, at *6 (W.D. Va. Aug. 24, 2017).

Whether the judicial systems use the “claim construction” term of art, or not, the framework of both § 101 and § 112(f) require the use of analytical tools to interpret the language and the scope of a patent’s claim. Thus, by definition, both involve claim construction. In situations where judicial notice is taken or limited construction is used to resolve underlying factual disputes, formal claim construction could provide the court with additional information about the invention, relative industry, and underlying scientific principles. Delaying resolution until a *Markman* would put greater emphasis on experts’ opinions and allow the parties to conduct fact discovery supporting their claim construction positions, broadening the court’s available evidence.²⁷⁷ The court would also be able to get specific claim language questions answered to understand the patent process.²⁷⁸

Still, district courts have opted for analytical tools over formal claim construction to “serve as a boon to defendants by providing an early opportunity to terminate a litigation and avoid substantial discovery and other litigation costs.”²⁷⁹ In appropriate cases, policy favors the resolution of patent lawsuits at the pleading stage, forgoing any benefits that may be accomplished through a *Markman* hearing.²⁸⁰ Patent eligibility challenges are one set of appropriate cases. Based on the comparability of frameworks and the ability to resolve disputes solely on the intrinsic record, pleading-stage means-plus-function challenges are equally as appropriate.

Finally, allowing an earlier validity challenge under § 112(f) does not undermine long-held procedural safeguards in pre-trial motions. This is because the factual presumptions in favor of the non-movant under Rule 12(b)(6) motions to dismiss or Rule 12(c) motions for judgment on the pleadings apply and are satisfied by the court.²⁸¹ When a court partakes in a “presumptive claim construction,” it presumes all potential factual allegations in favor of the non-movant,²⁸² which reflects the procedural requirements of pre-discovery motions.²⁸³ Further, under the framework, a non-movant still enjoys procedural safeguards in pre-trial motions related to patent validity challenges.²⁸⁴

While early-stage validity challenges were practically unheard of,²⁸⁵ a court

²⁷⁷ See Onstott, *supra* note 259, at 474; see also *Content Extraction & Transmission*, 779 F.3d at 1349.

²⁷⁸ See William F. Lee, *Still Adjusting to Markman: A Prescription for the Timing of Claim Construction Hearings*, 13 HARV. J.L. & TECH. 55, 65 (1999) (discussing the benefits of extrinsic evidence).

²⁷⁹ Leace & Blaszkowski, *supra* note 16.

²⁸⁰ See *infra* Section IV.

²⁸¹ *Visual Memory, LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1261 (Fed. Cir. 2017) (holding the district court’s assumptions improper “when reviewing a dismissal under Rule 12(b)(6)” because “all factual inferences must be drawn in favor of the non-moving party.”).

²⁸² The term “presumptive claim construction” describes the situation where a court proceeds in its analysis of a motion to dismiss by “adopting the non-moving party’s constructions.” See *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1125 (Fed. Cir. 2018).

²⁸³ See, e.g., *Erickson v. Pardus*, 551 U.S. 89, 93–94 (2007) (“[W]hen ruling on a defendant’s motion to dismiss, a judge must accept as true all of the factual allegations contained in the complaint.”).

²⁸⁴ See discussion *supra* notes 196–199.

²⁸⁵ *Gugliuzza*, *supra* note 10, at 614.

willing to entertain a motion to dismiss under patent eligibility should be open to entertaining a validity challenge at the same stage. A review of patent eligibility jurisprudence at the pleading stage displays that district courts entertaining challenges to patent eligibility under § 101 and courts that would entertain challenges to patent validity under § 112(f) would partake in similar frameworks, use similar analytical tools, and face similar difficulties. However, currently, motions under § 112(f) have been disparately treated in favor of delaying the case for a *Markman* hearing. District courts can, and should, make validity determinations at the pleading stage in specific situations, where there are conventionally bad patents.

4. *Mirroring Alice's Impact to § 112(f) Challenges*

The impact that *Alice* had on § 101 jurisprudence can be mirrored in § 112(f) cases. The Supreme Court's landmark ruling in *Alice* has had a profound impact on patent litigation.²⁸⁶ Historically, challenging patent eligibility was rare.²⁸⁷ At the turn of the century into the 2000s, the Federal Circuit and Patent Office had relaxed eligibility requirements.²⁸⁸ They regularly approved patent-ineligible subject matter.²⁸⁹ Before *Alice*, "filing a motion to dismiss to attack a patent's validity directly was almost unthinkable" since traditional defenses were acknowledged as issues to be determined during claim construction.²⁹⁰ If alleged infringers wanted a quick resolution, they would have to immediately settle the case with the patent holder or face a longer, expensive litigation battle.

Yet, the Supreme Court's ruling in *Alice* created a "big bang" for pleading stage patent challenges.²⁹¹ Because § 101 is a legal question, accused infringers could exit early in litigation, either through a motion to dismiss, a motion for judgment on the pleadings, or through summary judgment.²⁹² Since the ruling, there has been a spike in early challenges under § 101 at the pleading stage.²⁹³ Courts have not only been willing to entertain arguments against patent eligibility in pleading stage motions to

²⁸⁶ Matthew C. Bernstein & Miguel Bombach, *35 U.S.C. § 101: Post-Alice Landscape*, 4 NTUT J. INTELL. PROP. L. & MGMT. 73, 73 (2015) (stating that "[n]o case in recent history has had as profound an impact" as *Alice*).

²⁸⁷ Mercado, *supra* note 86, at 258–59 (finding pleading stage challenges rare because of a lack of "statistics on the frequency of motions to dismiss involving § 101" prior to *Alice*).

²⁸⁸ Gugliuzza, *supra* note 10, at 582.

²⁸⁹ *Id.*

²⁹⁰ Mercado, *supra* note 86, at 258; *see also* Gugliuzza, *supra* note 10, at 614 (calling pleading-stage invalidation through eligibility requirements "basically unheard of.").

²⁹¹ *See* Daniel Taylor, *Down the Rabbit Hole: Who Will Stand Up For Software Patents After Alice*, 68 MAINE L. REV. 217, 222 (2016) ("Within the first ten months after the *Alice* decision, U.S. courts had invalidated 3,026 claims in 117 U.S. patents in pretrial motions. By comparison, this represents more patents than those same courts had invalidated in the previous five years—often after detailed factual and legal inquiries."); *see also* Jesse Adland, *Alice Corp. v. CLS Bank International: Challenges in Identifying Patentable Subject Matter*, 26 INTELL. PROP. & TECH. L.J. 20, 21–22 (2014).

²⁹² Taylor, *supra* note 291, at 222, 242.

²⁹³ Rash et al., *supra* note 204.

dismiss,²⁹⁴ those arguments have been successful.²⁹⁵ The cost of “*Alice* motions” early in litigation is extremely less than the cost of trial,²⁹⁶ or even the cost associated with discovery and claim construction.²⁹⁷ *Alice* created a “litigation gatekeeper” in patent cases—“providing an early opportunity to terminate a litigation and avoid substantial discovery and other litigation costs.”²⁹⁸

A similar “litigation gatekeeper” is needed in means-plus-function cases.²⁹⁹ First, “means for” claim limitation enjoyed similar popularity at the turn of the century.³⁰⁰ The concerns over patent trolls present in the *Alice* decision have only intensified.³⁰¹ Favoring formal claim construction solely because of tradition is not only incorrect but also inefficient and costly.³⁰² Further, automatic denial of motions to dismiss means-plus-function claims escalate the likelihood of nuisance settlements to non-practicing entities.³⁰³ However, early challenges to patents under § 112(f) are permissible because of the similarity between the proposed analytical framework and patent eligibility framework.³⁰⁴ Alleged infringers challenge eligibility to protect against costly patent litigation when a patent is ineligible, and alleged infringers of means-plus-function claims should have a similar litigation gatekeeper to protect against the costs of litigating an invalid patent.

Therefore, not only are challenges under § 112(f) capable of resolution at the pleadings stage, but, as the next Section continues to discuss, public policy favors providing defendants with a pleading stage resolution to patent validity as a litigation gatekeeper to avoid substantial discovery and other litigation costs.

IV. Public Policy Favors Early Challenges

This Section reviews the public policy benefits that are accomplished through allowing pleading stage challenges under § 112(f) for conventionally bad patents. For instance, early exits for alleged infringers fight back against the increased litigation

²⁹⁴ Bohrer, *supra* note 203.

²⁹⁵ Rash et al., *supra* note 204 (finding an invalidation rate under § 101 at the pleading stage of 60% in 2015).

²⁹⁶ Compare Mercado, *supra* note 86, at 260 (estimating \$10,000–\$20,000 in attorney’s fees for briefing *Alice* motions), with ECONOMIC SURVEY, *supra* note 13, at 50 (reporting a range of \$700,000 to \$4 million in litigation costs that include pre- and post-trial motions, and appeal).

²⁹⁷ See ECONOMIC SURVEY, *supra* note 13, at 50.

²⁹⁸ Leace & Blaszkowski, *supra* note 16.

²⁹⁹ Resolution at the pleading stage in means-plus-function claiming to remove the conventionally bad patents from the patent system early in litigation is akin to the use of patent eligibility early in litigation. *Id.*

³⁰⁰ Dennis Crouch, *The Frequency of Means-Plus-Function Claims*, PATENTLY-O (July 25, 2011), <https://patentlyo.com/patent/2011/07/the-frequency-of-means-plus-function-claims.html>.

³⁰¹ Joe Mullin, *Seeing Patent Trolls Clearly: 2022 in Review*, ELECTRONIC FRONTIER FOUNDATION (Jan. 1, 2023), <https://www EFF.ORG/deeplinks/2022/12/seeing-patent-trolls-clearly-2022-review> (finding that “[i]n the first 3 quarters of 2022, 64% of all patent lawsuits were filed by patent trolls . . . [i]n the high-tech space, patent trolls filed 88% of all lawsuits.”).

³⁰² See ECONOMIC SURVEY, *supra* note 13, at 50.

³⁰³ Leace & Blaszkowski, *supra* note 16.

³⁰⁴ See discussion *supra* Section III.B.1.

costs sought by patent trolls.

A. Patent Trolls Increase Cost

Patent litigation is costly. There is a longstanding and general consensus that patent litigation is a more complex, and thus unique, form of civil litigation;³⁰⁵ complexity increases cost.³⁰⁶ The average cost to defend an infringement lawsuit in the United States is \$3.5 million.³⁰⁷

In the modern age of patent litigation, patent trolls have become more prevalent and introduce further complexities.³⁰⁸ At first glance, trolls should simplify litigation because there are no countersuits because trolls are non-practicing entities.³⁰⁹ An accused infringer simply has two options: (1) fight the infringement suit or (2) settle immediately. An accused infringer may try to invalidate the patent because the benefits can outweigh the costs of settling.³¹⁰ Nonetheless, the lack of potential infringing action by trolls diminishes any leverage a defendant may have when trying to settle

³⁰⁵ See Johnathan H. Ashtor, *Opening Pandora's Box: Analyzing the Complexity of U.S. Patent Litigation*, 18 YALE J.L. & TECH. 217, 219 (2016).

³⁰⁶ *Id.* at 222 (“[T]he high costs and complexity of patent trials is a strong factor in parties’ decisions to avoid litigation and negotiate settlement.”).

³⁰⁷ Gregory Day & Steven Udick, *Patent Law and the Emigration of Innovation*, 94 WASH. L. REV. 119, 125 (2019).

³⁰⁸ Additionally, while some recent developments are intended to simplify patent litigation, they instead cause further complications. For example, “patent pools” have become more prevalent and are meant to simplify patent litigation by cross-licensing to avoid lawsuits against a large group of potential infringers in a specific market. See Josh Lerner & Jean Tirole, *Public Policy Toward Patent Pools*, 8 INNOVATION POL’Y & ECON. 157, 157–58 (2007). Yet, the defensive nature of a patent pool can be transformed into an offensive attack, where multiple pool members initiate litigation against potentially infringing companies. See Lerner & Tirole, *supra* note 308, at 176. While competing companies with large IP portfolios are less likely to litigate against each other because the risks are increased, see Jason Schultz & Jennifer M. Urban, *Protecting Open Innovation: The Defensive Patent License as a New Approach to Patent Threats, Transaction Costs, and Tactical Disarmament*, 26 HARV. J.L. & TECH. 1, 6 n.28 (2012), patent pools do not have the same dangers and risks because the entity exists solely for one technology and does not participate in potentially infringing action in a related technology. See *id.* at 7 (discussing how defensive patenting is most effective between competitors who share the same high cost of litigation); see Lerner & Tirole, *supra* note 308, at 176 (noting that more problems occur when using the same standard licensing terms for different industries, where the norm may be to not pay royalties). With less risk, pools operate more like trolls when utilizing their large portfolio to leverage a defendant into a licensing deal through litigation. See Rob Merges, *Patents, Validity Challenges, and Private Ordering: A New Dispensation for the Easy-Challenge Era*, 23 NEV. L.J. 263, 292 (2023) (“When the defendant in a lawsuit potentially faces high costs, while the plaintiff does not, settlement may make sense.”). And like trolls, pools will be incentivized to ensure there are more litigations and that the litigations are longer and more complex litigations to garner as much leverage as possible. See *id.* (“With enough lawsuits, and enough lucrative settlements, the plaintiff lawyer (or company) has themselves a tidy business. This dynamic is common in areas such as personal injury suits and securities law ‘market loss’ suits. It is also the driving force behind ‘patent trolls.’”).

³⁰⁹ See Merges, *supra* note 308, at 292–93; see also Schultz & Urban, *supra* note 308, at 7–8.

³¹⁰ Jason Rantanen, *Slaying the Troll: Litigation as an Effective Strategy Against Patent Threats*, 23 SANTA CLARA HIGH TECH. L.J. 159, 161–62 (2006).

or resolve litigation quickly.³¹¹ When faced with either a \$3.5 million litigious fight and potentially losing the case, or a \$1 million settlement and licensing deal, an accused infringer is more likely to settle. Thus, the more expensive the litigation, the more leverage is in the troll's favor, incentivizing trolls to push for longer and more complex litigations.³¹²

Traditional patent trolls include companies that own patents in the hope of achieving a big jury award, but a growing number of trolls are interested in quick settlements for a variety of patents.³¹³ These entities rely on the high cost of patent litigation to induce parties to settle.³¹⁴ Yet, litigation places the patent at risk of invalidation.³¹⁵ To avoid the risk, trolls typically put settlement costs slightly below the cost of challenging the patent in court.³¹⁶ Length of time in litigation has a direct correlation with the increase of cost for the alleged infringer.³¹⁷ By pushing a litigation to the *Markman* stage, the cost increases from tens of thousands of dollars to millions.³¹⁸ Litigation duration is used as economic ammunition to increase settlement totals, which results in damage to practicing entities.

Further, patent trolls are most likely to use claims such as means-plus-function claims to assert against companies.³¹⁹ Broad claims, such as means-plus-function claims, allow trolls to assert the patent against a vast number of potential defendants.³²⁰ Functional claiming can apply to many different "means."³²¹ Based on the literal interpretation of the claim language alone, any structure that could accomplish the function is covered by the patent.³²²

However, claims are narrowed by the specification, which should protect alleged

³¹¹ Merges, *supra* note 308, at 293.

³¹² *Id.* ("The goal [of IPRs] was to lower the cost of patent invalidation. And thus, to lower the leverage patent owner/plaintiffs have when it comes to patent litigation.").

³¹³ Lemley & Melamed, *supra* note 6, at 2126.

³¹⁴ *Id.*

³¹⁵ See Rantanen, *supra* note 310, at 161; see also Lemley & Melamed, *supra* note 6, at 2128 (finding that patent trolls "need to be very careful in their litigation strategies because a patent that is found to be invalid in a final determination in one litigation is invalid thereafter for all purposes.").

³¹⁶ Coursey, *supra* note 4, at 241.

³¹⁷ See ECONOMIC SURVEY, *supra* note 13, at 50 (displaying increased cost as litigation continues into different stages).

³¹⁸ See *id.* at 51 (finding that when alleged infringers defend against claims by patent trolls, the initial case management costs \$40,000-\$200,000, but if discovery, motions, and claim construction are required, the cost increases to \$250,000-\$2.5 million).

³¹⁹ Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. PA. L. REV. 1309, 1347 (2013) (finding that roughly 80% of patent troll lawsuits were brought to enforce claims with high-tech subject matter).

³²⁰ See *id.*

³²¹ See Alexander Pachte, *Functional Claims*, JD SUPRA (Apr. 23, 2020), <https://www.jdsupra.com/legalnews/functional-claims-92442/> ("[A] 'means for' limitation on its face could cover any structure").

³²² *Id.*

infringers from overbroad and invalid patents.³²³ But patent trolls do not care about patent validity or if the claims can be narrowed.³²⁴ Instead, trolls want claims where the literal interpretation of the claim language is broad enough to encompass an alleged infringer's technology.³²⁵ Based on the business model of patent trolls, means-plus-function claims are some of the most likely to be asserted in an attempt to force a settlement.

All patent trolls have two intended goals: (1) accumulate broad patents and (2) assert said patents in a way that accomplishes the largest sum of money. Because district courts prefer pushing § 112(f) litigation fights to a *Markman* hearing, means-plus-function patents satisfy trolls' second goal, where they use a large litigation fee as leverage to get a larger settlement. Means-plus-function patents are closely tied to the dangers presented by patent trolls.

B. Providing a "Sword" To Fight Trolls Cheaply

The patent system can fight against patent trolls by decreasing the transaction cost to invalidate overbroad, bad patents. Pleading stage, pre-discovery dismissals decrease the cost of litigation. Compared to the millions of dollars it takes to fight a patent through trial, a pre-trial motion may only cost an alleged infringer \$10,000 to \$20,000 in legal fees.³²⁶ Empirical evidence shows that by avoiding discovery and a *Markman* hearing, alleged infringers would save approximately \$200,000 to \$2.3 million.³²⁷ By lowering the cost to weed out bad patents, more alleged infringers are likely to file a pleading stage motion to dismiss instead of settling.³²⁸ When defendants are not willing to settle, the business model of patent trolls becomes less profitable and less desirable.³²⁹

The patent system has a goal to "dispose of abusive patents inexpensively, reliably, and early in litigation."³³⁰ Under the prevailing view, "patent trolls deter innovation and harm the economy."³³¹ Patents that inhibit innovation must be weeded out. By decreasing the cost of litigation to alleged infringers against patent trolls, unwarranted lawsuits would be curbed. For example, many commentators believe that the

³²³ Gregory J. Maier & Bradley D. Lytle, *The Strategic Use of Means-Plus-Function Claims*, 80 J. PATENT & TRADEMARK SOCIETY 241, 243–44 (1998).

³²⁴ See Lemley & Melamed, *supra* note 6, at 2128.

³²⁵ See *id.* at 2173.

³²⁶ Mercado, *supra* note 86, at 260 (estimating \$10,000–\$20,000 in attorney's fees for briefing *Alice* motions).

³²⁷ See ECONOMIC SURVEY, *supra* note 13, at 50.

³²⁸ Stephanie E. Toyos, *Alice in Wonderland: Are Patent Trolls Mortally Wounded by Section 101 Uncertainty*, 17 LOY. J. PUB. INT. L. 97, 112 (2015).

³²⁹ *Id.*

³³⁰ Maria R. Sinatra, *Do Abstract Ideas Have the Need, The Need for Speed?: An Examination of Abstract Ideas After Alice*, 84 FORDHAM L. REV. 821, 847–48 (2015).

³³¹ Tracie L. Bryant, *The America Invents Act: Slaying Trolls, Limiting Joinder*, 25 HARV. J.L. & TECH. 687, 694 (2012).

Alice holding would impede patent trolls.³³² The holding provided some guidance that helped to invalidate the patents that hurt the system and that trolls prey on.³³³ Patent trolls lose the incentive to assert bad patents, which in turn reduces the ill effects of overly broad patents in the system.³³⁴

Specifically for means-plus-function claims, Mark Lemley has advocated for a stricter application of § 112(f).³³⁵ Lemley recognized that there are bad patents out there and invalidating such patents is a social good.³³⁶ He found that weeding out the patents in court would come at a high cost and only solve some of the problems.³³⁷ Yet, decreasing the cost to challenge patents in court provides a “sword” against patent trolls. While not all problems associated with trolls or bad patents will be solved by making the cost of challenging patents cheaper, providing a “litigation gatekeeper” to invalidate overly broad patents is a step in the right direction. As stated by Lemley, “the ability to dismiss a suit, in addition to the greater risk that a troll might have to pay legal costs, has hindered trolls using the nuisance value business model.”³³⁸ Each step taken against patent trolls benefits not only the alleged infringer but the entire patent system.

C. Additional Benefits

District courts entertaining challenges to patent validity not only help with lowering the transaction cost to alleged infringers against patent trolls but also benefit the patent system in its entirety. Patent law incentivizes innovation and creative ideas, which stimulates economic growth and technological advancements. However, not all patents accomplish this goal. Sometimes invalid or ineligible patents make their way through the system, and instead of promoting innovation and growth, these bad patents threaten the system.³³⁹ Removing these patents from the system will help satisfy the intended policy goals of patent law.

According to the National Research Council of the National Academies, there are four primary effects bad patents have on innovation and competition:

- (1) In contrast to incentives to genuine innovation, patents on trivial innovations may confer market power or allow firms to use legal resources aggressively as a competitive weapon without consumer benefit.
- (2) Poor patents could encourage more charges of infringement and litigation, raising transaction costs.
- (3) The proliferation of

³³² See Sinatra, *supra* note 330, at 847–48 (2015); Toyos, *supra* note 328, at 110 (“The Supreme Court decision in *Alice* can be viewed as taking one step closer towards stopping [patent trolls’] abusive tactics.”).

³³³ Toyos, *supra* note 328, at 110.

³³⁴ See Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 WISC. L. REV. 905, 938–39 (2013) (“[M]ost . . . [bad] patents have no ill effects.”).

³³⁵ See generally *id.* at 943–49.

³³⁶ *Id.* at 939.

³³⁷ *Id.*

³³⁸ Toyos, *supra* note 328, at 112.

³³⁹ See NAT’L RES. COUNCIL, A PATENT SYSTEM FOR THE 21ST CENTURY 95 (Stephen A. Merrill et al. eds.) (2004), <https://nap.nationalacademies.org/read/10976/chapter/6#94>.

low-quality patents in a technology complicates and raises the cost of licensing or avoiding infringement. (4) The uncertainty about the validity of previously issued patents may deter investment in innovation and/or distort its direction.³⁴⁰

Additionally, overly broad patents inhibit the growth of knowledge in society.³⁴¹ The pace of innovation is slowed because ideas are no longer shared or borrowed between inventors.³⁴² As a result, markets are disrupted, and consumers and smaller inventors are hurt.³⁴³

Yet, when overly broad patents can be invalidated through litigation, society benefits because public policy only favors the protection of *valid* patents.³⁴⁴ Innovation will flourish with the removal of bad patents because companies would not have to spend resources consulting with a large number of patent holders.³⁴⁵ Instead of companies wasting resources on litigation, they can devote the funds to further innovation.³⁴⁶ Building off of valid patents results in better products and services.³⁴⁷ Consequently, the higher levels of innovation will allow for greater rates of economic growth.³⁴⁸

In sum, while patent litigation is costly, the use of pleading stage, pre-discovery motions to dismiss to invalidate certain bad patents decrease the transaction cost to alleged infringers. The use of an analytical framework similar to the one presented by the Supreme Court in *Alice* will allow alleged infringers to fight against patent trolls. This, in turn, will decrease troll activity and benefit the patent system in its entirety.

V. Conclusion

The use of § 112(f) at the pleading stage is a sleeping giant of patent litigation. Whether the validity of means-plus-function claims can be challenged through a pleading stage motion to dismiss or motion on the pleadings has remained an open question. The Federal Circuit has not been provided direct guidance to district courts, which has resulted in a district court split. To resolve the open question, this Article argues for an analytical framework of § 112(f) challenges that can be simplified to

³⁴⁰ *Id.*

³⁴¹ Matthew Bye et al., *PANEL I: Do Overly Broad Patents Lead to Restrictions on Innovation and Competition?*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 947, 962 (2005).

³⁴² *The Great IP Debate: Do Patents Do More Harm Than Good?*, SCIENCE BUSINESS (July 28, 2016), <https://sciencebusiness.net/news/79887/The-Great-IP-Debate%3A-Do-patents-do-more-harm-than-good%3F>.

³⁴³ See Andres Guadamuz Gonzalez, *The Software Patent Debate*, 1 J. INTELL. PROP. L. & PRAC. 196, 204 (2006).

³⁴⁴ *EZ Gard Indus., Inc. v. XO Athletic Co.*, No. 07-CV-4769 (JMR/FLN), 2008 WL 1827490, at *5 (D. Minn. 2008), *aff'd*, 302 F. App'x 920 (Fed. Cir. 2008).

³⁴⁵ Sinatra, *supra* note 330, at 848.

³⁴⁶ *See id.*

³⁴⁷ See Grace Heinecke, *Pay the Troll Toll: The Patent Troll Model is Fundamentally at Odds with the Patent System's Goals of Innovation and Competition*, 84 FORDHAM L. REV. 1153, 1158 (2015).

³⁴⁸ *See id.*

get rid of conventionally bad patents by using the broadest reasonable interpretation of the claim language and an adequacy presumption. In certain cases, where clearly no structure exists that can satisfy any claimed function or the structure is not adequate, the means-plus-function claims should be found invalid under § 112(f). This will ensure that only patents that are improperly in the patent system and that have no hopes of survival at a Markman hearing with a subsequent summary judgment motion can be removed from the system at a low transaction cost to the alleged infringers.

Similar to district courts entertaining challenges to patent eligibility under § 101 at the pleading stage, the courts should entertain challenges to patent validity under § 112(f) early in patent litigation. After reviewing case law related to patent eligibility, it is clear that the analytical framework of § 101 requires an interpretation of the patent's claim, which requires district courts to conduct a form of claim construction. Thus, both the *Alice* framework and the § 112(f) framework argued here contain two comparable steps with minimal claim construction, and both can be resolved at the pleading stage.

Not only are challenges under § 112(f) capable of resolution at the pleadings stage, but public policy favors providing alleged infringers with an early exit to avoid substantial discovery and other litigation costs. By decreasing the cost of litigation to alleged infringers against patent trolls, unwarranted lawsuits would be curbed. When cases are brought, decreasing the transaction costs to alleged infringers benefits the patent system because only overly broad patents that are not intended to be in the system will be invalidated. Therefore, by answering the open procedural question regarding patent validity and making a small change to the jurisprudence of § 112(f), bad patents can be invalidated cheaper in litigation resulting in benefits to the patent system and society at large.