CLAIM ELEMENTS, CLAIM LIMITATIONS, AND AVOIDING DIVIDED PATENT INFRINGEMENT

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INTRODUCTION

Despite mention by the Federal Circuit throughout its decisions of claim elements and claim limitations, few decided cases from the Federal Circuit exist on the

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difference between these separately identified concepts.[1] The accepted wisdom suggests that a claim limitation is a broader concept than a claim element, but beyond that, little distinction has apparently been made.[2]

This article provides an analytic distinction that is conceptually supported by case law, although without courts necessarily employing the labels "claim element" and "claim limitation" as such. Nonetheless, this approach adds some value to those who study, draft, and argue about the meaning of patent claims. This analytical distinction is not merely academic. Rather, it affects claim construction and the scope of direct literal patent infringement (hereinafter, "patent infringement" unless otherwise indicated). Furthermore, the proposed analytic framework provides a useful tool for patent claim drafting, which includes patent claim drafting to potentially capture more infringers and patent claim drafting with respect to so-called divided infringement, meaning claim drafting to reduce the risk of having divided infringement.[3]

The first section addresses the few Federal Circuit cases that discuss the difference between a claim element and a claim limitation in some fashion.[4] The second section provides an analytical framework for distinguishing

[1] *See infra* Section 1.

[2] *See infra* Sections 1, 2.

[3] *See infra* Section 3. For purposes of this article, divided patent infringement refers to a situation in which, because no single party completes all the elements and limitations of the patent claim, no one is liable for patent infringement of the patent claim. Joint patent infringement is a similar concept in that multiple parties perform all the elements and limitations of a patent claim, and technically, again, no single party completes all the elements and limitations. For the purposes of this article, joint patent infringement refers to a situation in which on policy grounds, such as that the multiple parties are related in some way, all the elements and limitations are attributable to at least one party so that patent infringement is held to have taken place and there is liability.

[4] *See infra* Section 1.

between the two concepts—claim elements and claim limitations—using claim construction and claim drafting examples.[5] The third section then discusses the caselaw of divided patent infringement, including an analysis thereof with respect to the proposed construct.[6] Finally, the fourth section uses, as a first example, the claim at issue in the seminal divided patent infringement case, *BMC v. Resources*, to show how the proposed analytic framework provides a useful claim construction and claim drafting tool to potentially increase the scope of patent infringement and assist in avoiding divided patent infringement. That section includes two more illustrative hypothetical claim examples to further demonstrate how the proposed analytic approach assists with claim construction and claim drafting.[7]

I. CLAIM ELEMENTS/CLAIM LIMITATIONS AND THEIR RELATIONSHIP

The difference between an element and a limitation of a patent claim has been a confusing and unsettled issue in patent law.[8] Likewise, if a patent claim includes elements *and* limitations, what part of the claim constitutes the relationship among these potentially distinct claim components?[9] These are good questions, and the case law

[5] *See infra* Section 2.
[6] *See infra* Section 3.
[7] *See infra* Section 4.
[8] It is noted here that this difference could potentially matter for the interpretation of patent regulations and statutes, although it does not currently appear to have affected such interpretations. For example, 37 C.F.R. § 1.75(i) (2024) states: "Where a claim sets forth a plurality of *elements* or steps, each *element* or step of the claim should be separated by a line indentation" (emphasis added). Likewise, 35 USC § 112(f) (2024) states: "An *element* in a claim for a combination . . . ." (emphasis added).
[9] A patent claim is understood to generally include claim elements, claim limitations, and their relationship. *See* HOWARD A. SKAIST, PATENT CLAIM DRAFTING PRACTICE (ABA, Intell. Prop. L. Section,

may not be fully consistent regarding answers. The few cases that touch on the issue at all suggest a variety of ways to view the situation.[10] This article, however, provides an internally consistent analytic view.

The Federal Circuit has used both the terms "elements" and "limitations" to describe the words of a claim.[11] As an example, in *Kustom Signals*, [12] the Federal Circuit indicated that an exclusive disjunctive "or" was, in particular, *not* a *claim element*.

The ′246 patent was directed to a traffic radar system incorporating digital signal processing having user-selectable modes of operation.[13] The device stored returned signals for processing.[14] Stored returned signals were searched based on "preselected magnitude or frequency criteria."[15] The accused radar device "at issue operated similarly, except that both a strongest *and* a fastest

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2023); *see also* HOWARD A. SKAIST, PRINCIPLES OF PATENT CLAIM DRAFTING AND PATENT CLAIM ANALYSIS: CASES, MATERIALS, QUESTIONS AND PROBLEMS 195 (ABA, Intell. Prop. L. Section, 2024).

[10] *Compare* Dawn Equip. Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 1014 n.1 (Fed. Cir. 1998), *with* Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315 (Fed. Cir. 1998). In *Dawn*, the court states that it is preferable to use the term "limitation" when referring to claim language and the term "element" when referring to the accused device.

[11] *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 563 n.1 (Fed. Cir. 2000) (en banc), *rev'd*, 535 U.S. 722 (2002) (stating, "In our prior cases, we have used both the term 'element' and the term 'limitation' to refer to words in a claim."); Lemelson v. United States, 752 F.2d 1538, 1551 (Fed. Cir. 1985) (using the term "element"); Sextant Avionique, S.A. v. Analog Devices, Inc., 172 F.3d 817, 826–27 (Fed. Cir. 1999) (using the term "limitation"). *See Dawn Equip. Co.*, 140 F.3d at 1014 n.1; *see also Ethicon Endo-Surgery, Inc.*, 149 F.3d at 1315.

[12] Kustom Signals, Inc. v. Applied Concepts, Inc., 264 F.3d 1326, 1333 (Fed. Cir. 2001).

[13] *Id.* at 1328–29.

[14] *Id.*

[15] *Id.* at 1330.

analysis of the return signal was always performed, and are not subject to operator selection."[16] In view of the claim language at issue, the patent's specification, and its prosecution history, the claims required that one of the two criteria *alternatively* be searched.[17] Specifically, the claims had been amended from a form that employed "and" to the issued form of the claim using "or."[18] Hence, the claims were not literally infringed by a device that automatically searches for both magnitude *and* frequency.[19]

However, when analyzing infringement under the doctrine of equivalents ("DOE") and applying the "all elements" rule, the appellate court seemed to get slightly hung up. It stated:

> The district court ruled that there was not infringement under the doctrine of equivalents on the ground that finding the accused device equivalent to the claimed invention would eliminate the "or" element of the claims, thereby violating the all-elements rule. However, this is not an appropriate application of the all-elements rule.
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> The all-elements rule is that an accused device must contain every claimed element of the invention or the equivalent of every claimed element. No claimed element, or an equivalent thereof, can be absent if the doctrine of equivalents is invoked. However, all of the steps or elements of method claim 1 or apparatus claims 16 and 20 are undisputedly present in the accused device. The word "or" is not itself an "element" of an apparatus or a step of a method, and its presence to signify alternative elements does not

[16] *Id.* at 1329.
[17] *Id.* at 1331–32.
[18] *Kustom Signals, Inc.*, 264 F.3d at 1330–32. Claim 20 *specifically* used the formulation ". . . *either* . . . *or* . . . ."
[19] *Id.* at 1332.

> convert "or" into an element. The ruling of non-infringement can not be sustained on this ground.[20]

However, the court then determined that prosecution history estoppel prevented infringement under the DOE.[21] The court's reasoning in the case seems to be an almost mechanical application of the "all elements" rule and that, because "or" was not an element, according to the court, another way to resolve infringement or non-infringement with respect to the DOE was required and ultimately found.[22]

One case that raises an issue regarding a "limitation" in connection with a discussion of the "all elements" rule is *Ethicon*.[23] *Ethicon* dealt with this issue from the perspective of the DOE.[24]

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[20] *Id.* at 1333 (citation omitted).

[21] *Id.*

[22] *Id.* at 1333 (affirming district court's application of estoppel).

[23] *See* Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315 (Fed. Cir. 1998).

[24] *See id.* As a quick primer, the DOE, a judge-made doctrine, allows a patent holder to claim patent infringement if a product or process does not literally meet the exact language of a patent claim but contains so-called "equivalents" for some or all of the elements and limitations. There are two accepted legal tests for an equivalent. *See, e.g.*, Warner-Jenkinson Co. v. Hilton Davis Co., 520 U.S. 17, 39–40 (1997). One test is whether the equivalent performs substantially the same function, in substantially the same way, to accomplish substantially the same result as the particular element or limitation. *Id*. If so, then despite lack of literal infringement, the equivalent may potentially be used to meet the missing element or limitation and show patent infringement, although ultimate liability is subject to other issues, such as prosecution history estoppel (PHE). Another test is the insubstantial differences test. *Id.* In this case, the question is whether the asserted equivalent has insubstantial differences from the literal element or limitation of the patent claim. *Id.* If so, then similarly, the equivalent may be used to meet the missing element or limitation and show patent infringement, although, again, it is subject to other doctrines, such as PHE, for liability.

In *Ethicon*, a tricky DOE issue was considered on appeal for claims 6 and 24 of the patent, in which a "lockout mechanism" prevented a surgical stapler from firing when a cartridge containing staples was exhausted.[25] Claim 6 of the patent specifically claimed the location of the lockout mechanism.[26] The accused device placed a lockout mechanism at the distal end, "nowhere near" claimed "longitudinal slots," the latter of which were recited in claim 6 as being connected to the lockout mechanism.[27] For this reason, the Federal Circuit held that the district court correctly granted summary judgment of no DOE infringement (and no literal infringement, of course) as to claim 6.[28] Claim 24, in contrast, was not specific as to the lockout mechanism's location.[29] The Federal Circuit held that the district court erred in granting summary judgment of no infringement under the DOE as to Claim 24.[30] The court stated:

> [W]e cannot say as a matter of law that [the] difference [between the claimed and accused structure] is substantial. It is a subtle difference in degree, not a clear, substantial difference or difference in kind, as was the case regarding claim 6. . . . ("There seems to be substantial agreement that, while the triple identity test may be suitable for analyzing mechanical devices, it often provides a poor framework for analyzing other products or processes.").[31]

[25] *Ethicon Endo-Surgery, Inc.*, 149 F.3d at 1311–12.
[26] *Id.* at 1311–13.
[27] *Id.* at 1318–19.
[28] *Id.*
[29] *Id.* at 1313.
[30] *Id.* at 1321.
[31] *Ethicon Endo-Surgery, Inc.*, 149 F.3d at 1321 (citation omitted).

Thus, the court remanded the issue back to the district court to reconsider.[32]

Cases talk of an "all elements" rule for patent infringement that specifically includes the DOE;[33] however, this is sometimes called an "all limitations" rule.[34] It is not entirely clear how the Federal Circuit views the difference between a claim element and a claim limitation. Often, elements and limitations appear to be viewed as largely interchangeable terminology.[35] If the latter is correct, there is no real difference between an "all elements" rule and an "all limitations" rule. Some, on the other hand, may view the term "limitation" as a more general term that includes an "element." Hence, footnote 1 of *Ethicon* states:

> We have said that "[i]n the All Elements rule, 'element' is used in the sense of a *limitation* of a claim," and "[i]t is the *limitation* of a claim that counts in determining both validity and infringement, and a limitation may include descriptive terms." Thus, the All Elements rule might better be called the All Limitations rule. It will be referred to as such throughout the remainder of this opinion.[36]

In another case, the Federal Circuit seems to have, again, expressed a preference for "limitation" over "element," but for reasons that do not suggest

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[32] *Id.* at 1321.

[33] Courts, for example, typically state: "Infringement may be found [either literally or] under the doctrine of equivalents if every [element and] limitation of the asserted claim, or its 'equivalent,' is found in the accused subject matter, where an 'equivalent' differs from the claimed limitation only insubstantially." *See, e.g.*, *id.* at 1315.

[34] *See id.* at 317 n.1.

[34] *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 563 n.1 (Fed. Cir. 2000) (en banc), *rev'd*, 535 U.S. 722 (2002) (stating: "In our prior cases, we have used both the term 'element' and the term 'limitation' to refer to words in a claim.").

[36] *Id.* (citations omitted).

interchangeability. In *Dawn Equipment*,[37] the appellate court indicates that "limitation" applies to the claim, whereas "element" applies to the accused device.[38] The Federal Circuit reversed a jury ruling that a means-plus-function clause was not literally infringed but was infringed under the DOE.[39] The court noted that "[f]or purposes of our discussion, and because neither party addresses the point, we shall assume that it is legally proper to apply the doctrine of equivalents to a claim drafted in means-plus-function form."[40] Despite this conclusion, two judges in concurrence suggested there should be no DOE for a means-plus-function clause.[41]

Specifically, however, the element/limitation issue was raised in *Dawn Equipment* due to 35 U.S.C. § 112, para. 6, (currently § 112 (f)).[42] 35 U.S.C. § 112(f) ("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 . . . ."[43] Such clauses using this format are referred to as means-plus-function or step-plus-function ("m+f" or "s+f," respectively) clauses. For cases involving means-plus-function clauses that pertain to infringement, a m+f clause tends to narrow the scope of a claim, but it can also be pertinent to determining the

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[37] Dawn Equip. Co. v. Kentucky Farms, Inc., 140 F.3d 1009 (Fed. Cir. 1998).
[38] *See id.* at 1014 n.1.
[39] *Id.* at 1010.
[40] *Id.* at 1015 n.2.
[41] *See id.* at 1022–23.
[42] *See id.* at 1015; 35 U.S.C. § 112(f) (emphasis added) (stating, "*Element* in Claim for a Combination. An *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.").

[43] 35 U.S.C. § 112(f).

patentability of the claim over prior art.[44] Section 112(f), again, expressly recites that "*an element . . . may be expressed* as a means or step for performing a specified function without the recital of structure . . . ."[45]

The infringement analysis under 112(f) for such a clause is (1) whether the function recited is identically met by the accused product, and (2) whether the accused product has the same corresponding structure described in the specification for the recited function or, if there are differences, whether those differences are insubstantial.[46] Could one, then, perhaps argue, in light of the statutory language, that subsection 112(f) should not apply because the claim language at issue is a claim limitation rather than a claim element?[47]

The view expressed in *Dawn,* that it is preferable to use the term "limitation" when referring to claim language and the term "element" when referring to the accused device, may point toward the approach proposed in this article. However, *Dawn* does not provide a sufficiently sharp clarification between the use of "element" and "limitation" to be particularly helpful in connection with claim construction, patent infringement, and/or patent claim

[44] *See, e.g.*, *In re* Donaldson, 16 F.3d 1189, 1193–94 (Fed. Cir. 1994).
[45] 35 U.S.C. § 112(f) (emphasis added).
[46] *See, e.g.*, Valmont Industries, Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042–43 (Fed. Cir. 1993).
[47] Case law does not seem to support such an approach. *See* Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1268 (Fed. Cir. 1999) ("[A] claim limitation written in § 112, ¶ 6 form, like all claim limitations, must be met, literally or equivalently, for infringement to lie. . . . [T]he claim limitation is the overall structure corresponding to the claimed function."); Sofamor v. Depuy, 74 F.3d 1216, 1020 (Fed. Cir. 1996) (referring to "body attaching means" interchangeably as a § 112, ¶ 6 means element and means limitation).

drafting. Furthermore, other cases seem to not comprehend a difference at all.[48]

II. ANALYSIS OF CLAIM ELEMENTS AND CLAIM LIMITATIONS

One approach might be to consider elements, limitations, and the relationship thereof as existing on a spectrum; however, this approach has the disadvantage of further blurring the distinction between the two concepts. Perhaps, instead, an analogy with other areas of law might be more helpful.

In criminal and tort law, there is a notion of an "act" that is committed, an "intent" to commit the act, and also of "attendant circumstances" that must be present for liability.[49] Perhaps, one way to think of a claim is that the claim elements are like "the act or acts" of a tort and the limitations are like "the attendant circumstances."[50] By

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[48] *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 563 n.1 (Fed. Cir. 2000) (en banc), *rev'd*, 535 U.S. 722 (2002); Lemelson v. United States, 752 F.2d 1538, 1551 (Fed. Cir. 1985); Sextant Avionique, S.A. v. Analog Devices, Inc., 172 F.3d 817, 826–27 (Fed. Cir. 1999). In one case, the court states that it is preferable to use the term "limitation" when referring to claim language and the term "element" when referring to the accused device. *See* Dawn Equip. Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 1014 n.1 (Fed. Cir. 1998); *see also* Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315 (Fed. Cir. 1998).

[49] It is worth noting that as a technical matter, patent infringement is a tort, albeit one created by federal statute. *See* Nathaniel Grow, *Joint Patent Infringement Following Akamai*, 51 AM. BUS. L.J. 71, 77 (2014); *Attendant Circumstances in Legal Cases – How They Influence Court Outcomes*, ATT'YS.MEDIA, https://attorneys.media/attendant-circumstances/ [https://perma.cc/6FNX-ZR89]; *see also* PATENT CLAIM DRAFTING PRACTICE, *supra* note 9.

[50] *See* PATENT CLAIM DRAFTING PRACTICE, *supra* note 9*; see also* PRINCIPLES OF PATENT CLAIM DRAFTING AND PATENT CLAIM ANALYSIS: CASES, MATERIALS, QUESTIONS AND PROBLEMS, *supra* note 9. *Cf.* INVT SPE LLC v. ITC, 46 F.4th 1361, 1376 (Fed. Cir. 2022)

analogy with this construct, claim elements are components recited in the claim that *necessarily* are present in an accused product (like "acts"), while claim limitations are *further clarifications* about those elements that also must be met (like "attendant circumstances"), but need not be *actually* present *as elements* of the accused product for there to be patent infringement. Hence, a claim element is not necessarily the same as a claim limitation. That is, a claim limitation is *not simply* a broader term for a claim element under this view.

Granted, this difference is subtle, but it has some power with respect to the analysis of a patent claim. Under this view, limitations are not necessarily instantiated as such[51] in the accused product, as illustrated and explained below.[52] It is also meant to communicate that this distinction is a matter of *linguistic form*. However, this matter of form ultimately becomes, or at least may become, a *matter of substance* regarding claim scope.

One helpful way to distinguish claim elements from claim limitations is similar to the notion of writing a dependent claim. One may use "wherein," or one may use

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(distinguishing in analysis of claim, whether base station was part of the environment of the claims and whether to infringe one would need to make, use, or sell the base station). Of course, as to patent infringement, there is no intent requirement.

[51] Meaning, here, that the limitation is not necessarily a *present*, *physical* claim component for purposes of determining patent infringement by an accused infringer. *See* W. Keith Robinson, *Ramifications of Joint Infringement Theory on Emerging Technology Patents*, 18 TEX. INTELL. PROP. L.J. 335, 367–68 (2010) (discussing Level 3 Commc'ns, LLC v. Limelight Networks, Inc., 630 F. Supp. 2d 654 (E.D. Va 2008)).

[52] What, then, of "the relationship among elements and/or limitations?" The relationship may, perhaps, refer to the relationship among the elements and may comprise all the limitations of the claim as a whole. *See, e.g.,* PRINCIPLES OF PATENT CLAIM DRAFTING AND PATENT CLAIM ANALYSIS: CASES, MATERIALS, QUESTIONS AND PROBLEMS, *supra* note 9.

"and further comprising." Here, "wherein" introduces a claim limitation, whereas "and further comprising" introduces a claim element.[53]

Consider the following claim that Examples 1 and 2 provide below. To make this more concrete, we consider a technical problem for a computer system involving transfers into or out of memory, usually to or from a peripheral device such as a hard drive, graphics card, network interface card, and so on. These transfers may be thought of as transfers of *physical* signal values and/or *physical* state values.[54]

Typically, a central processing unit, a CPU (e.g., microprocessor), controls such transfers within a computer system, but this approach has several disadvantages. It ties up CPU resources and slows the transfer by adding latency due to the overhead from CPU involvement in the transfer.

A type of transfer into and out of memory was later invented called "burst mode." Although the CPU initiates the transfer and provides a starting memory address and word count for the transfer, the operation is subsequently controlled by a memory controller, which takes control of the system transfer bus from the processor. After the transfer is complete, the CPU is notified and resumes control of the system transfer bus.

Burst mode refers to a transfer of contents into or out of sequential memory cells in a "burst," rather than a transfer of contents into and out of memory one single memory cell at a time. While the initial transfer, or first memory cell, in burst mode may take as long as a transfer to or from a single memory cell, each subsequent memory transfer takes only a fraction of the time. For example, it might take a 100 MHz 32-bit bus about five bus cycles for a transfer of the contents of one cell that involves the CPU,

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[53] *See id.*; *see also* PATENT CLAIM DRAFTING PRACTICE, *supra* note 9.

[54] This clarifies that these qualify as potentially patentable subject matter under 35 U.S.C. § 101 (2024).

whereas after the initial transfer, it may take one bus cycle per memory cell in burst mode. If substantial amounts of memory cells are involved, the savings in terms of time may be significant.

Rewind now to when burst mode was invented, and assume it was sought to be patented. Claiming burst mode operation at the component level can be tricky, as it involves the CPU, the memory cells, the memory controller, the system transfer bus, and, perhaps, a peripheral. A claim that includes all these elements would tend to be infringed by a system integrator or someone selling an end product,[55] but not necessarily by a manufacturer producing only a component, such as memory with a memory controller (which is considered here as one memory component).

Therefore, to encompass a memory manufacturer, burst mode should be claimed from the perspective of the memory component. We start with an apparatus claim since that covers rights to make, use, sell, offer for sale, and import the claimed invention. Based on the prior technical description, Example 1 is a possible patent claim to cover the technical subject matter.

EXAMPLE 1

I claim:

1. An apparatus comprising:

random access memory (RAM) and a memory;
wherein the memory controller is capable of initiating burst mode operation based, at least in part, on receipt of an externally derived request from an external central processing unit (CPU);

[55] An example might be a mobile device, such as a smart phone, a tablet, and/or a laptop. *See, e.g.*, *INVT SPE LLC*, 46 F.4th at 1364.

> wherein the request is to include a memory address, a word count, and a read or a write control transfer designation; and
> wherein the memory controller is to process the request and take control of an external system transfer bus.

In Example 1, random access memory and the memory controller are *claim elements* in that they *must be present* in the accused product for patent infringement. In this claim, using the proposed analytical construct, the CPU and the system transfer bus are recited as *limitations* in the claim, rather than as *elements*. The recited limitations must be *met* by the claimed apparatus but, under the view presented here, the CPU and system transfer bus *are not required to be present* for patent infringement of claim 1.[56] Rather, the claim itself, for purposes of clarification, refers to "an external CPU," "an external system transfer bus," and "an externally derived request." However, the analysis would be the same without words such as "external" or "externally derived." As an illustration, the system transfer bus need not be present as such in the accused product, but the memory controller must be able to "take control of an external system transfer bus" for direct infringement of the claim of Example 1. In other words, these limitations must be capable of being met[57] for an accused product to be

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[56] *See* PATENT CLAIM DRAFTING PRACTICE, *supra* note 9; *see also* PRINCIPLES OF PATENT CLAIM DRAFTING AND PATENT CLAIM ANALYSIS: CASES, MATERIALS, QUESTIONS AND PROBLEMS, *supra* note 9. *Cf. INVT SPE LLC*, 46 F.4th at 1375 (distinguishing in the analysis of the claim whether the base station was part of the environment of the claims and whether to infringe one would need to make, use, or sell the base station).

[57] Specifically, without modification of the accused product. *See. e.g.*, *INVT SPE LLC*, 46 F.4th at 1375.

within the scope of claim 1 of Example 1. Now, consider the claim of Example 2:

EXAMPLE 2

I claim:

1. An apparatus comprising:

random access memory (RAM), a memory controller, a central processing unit (CPU), and a system bus;
wherein the memory controller is capable of initiating burst mode operation based, at least in part, on receipt of a request from the CPU;
wherein the request is to include a memory address, a word count, and a read or a write control transfer designation; and
wherein the memory controller is to process the request and take control of the system transfer bus.

In Example 2, again, random access memory and the memory controller are claim elements; however, *so are the CPU and system transfer bus*. Thus, *these must all be present in the accused product for patent infringement.* The CPU and system transfer bus are *also* part of the claim with respect to *the limitations*. The recited *limitations* must also be met as before. However, here, as *recited elements*, the CPU and system transfer bus are *required to be present* for patent infringement of claim 1 of Example 2, but *not* merely because they are recited in the limitations. Rather, in claim 1 of Example 2, these are recited to be (and are intended to be) claim elements.[58] Hence, for purposes of

[58] *See* PATENT CLAIM DRAFTING PRACTICE, *supra* note 9; *see also* PRINCIPLES OF PATENT CLAIM DRAFTING AND PATENT CLAIM

patent infringement, the scope of claim 1 is broader than claim 2, since the CPU and the system transfer bus are claim limitations, but not claim elements as in claim 1. This analysis points out the opportunity to draft a broader claim by differentiating claim elements and claim limitations.

However, as previously indicated, there are also Federal Circuit cases that suggest little difference between claim elements and claim limitations, particularly with respect to infringement.[59] Hence, the cases are not entirely consistent. Nonetheless, the proposed distinction, while subtle, seems to provide a workable difference and insights about how to draft and analyze the language of a patent claim for purposes of patent infringement. Imagine, for example, a component of a larger apparatus, such as finger trigger intended to be part of a rifle. A claim may recite:

> 1. An apparatus comprising: a finger trigger, wherein the finger trigger is operable to be included in a rifle.

Although an accused product must meet the limitation "wherein the finger trigger is operable to be included in a rifle," the rifle is *not an element* of the claim because the finger trigger is not *required* to be a *part of a rifle* for patent infringement to take place. That is, it only needs to

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ANALYSIS: CASES, MATERIALS, QUESTIONS AND PROBLEMS, *supra* note 9.

[59] *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 563 n.1 (Fed. Cir. 2000) (en banc), *rev'd*, 535 U.S. 722 (2002); Lemelson v. United States, 752 F.2d 1538, 1551 (Fed. Cir. 1985); Sextant Avionique, S.A. v. Analog Devices, Inc., 172 F.3d 817, 826–27 (Fed. Cir. 1999); Dawn Equip. Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 1014 n.1 (Fed. Cir. 1998); *see also* Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 149 F.3d 1309, 1315 (Fed. Cir. 1998).

be "operable to be included in a rifle." Thus, to directly and literally infringe, the finger trigger must be capable of operating as a finger trigger *when it is included in a rifle*. Hence, "finger trigger" is a claim element, and "operable to be included in a rifle" is a claim limitation. To take this further, a dependent claim 2 may recite:

> 2. The apparatus of claim 1, and further comprising the rifle, wherein the finger trigger is integrated into the rifle.

Now, the rifle *is* a claim element of claim 2. Again, but more clearly through dependency, claim 1 is broader than claim 2 using this claim element/claim limitation construct.

A recent Federal Circuit case supports this approach, but without expressly using the distinguishing language "claim element" and/or "claim limitation." In *INVT SPE LLC v. International Trade Commission*,[60] the Federal Circuit affirmed the International Trade Commission's ("ITC") determination that the respondents did not violate 19 U.S.C. § 1337.[61] INVT alleged that the importation and sale of LTE-compliant personal electronic devices infringed U.S. Patent 7,848,439 ("the '439 patent").[62] The ITC determined that the asserted claims were not essential to the LTE standard and that the accused products did not infringe the asserted claims.[63]

However, before reaching this conclusion, it was necessary to construe the claims at issue in the '439 patent, which related to wireless communication systems. Specifically, an improvement to adaptive modulation and coding ("AMC") is a technique used to transmit signals in

[60] 46 F.4th at 1375.
[61] *Id.*
[62] *Id.*
[63] *Id.*

an orthogonal frequency division multiplexing ("OFDM") system. Claim 1 of the '439 patent recited:[64]

> 1. A communication apparatus comprising:
>
> [a] a channel estimating section that carries out a channel estimation per subband;
>
> [b] a parameter deciding section that decides modulation parameters and coding parameters per subband group comprised of a plurality of the subbands, based on a result of the channel estimation per subband;
>
> [c] a parameter information transmission section that transmits, to a communicating party, parameter information indicating the modulation parameters and the coding parameters decided at the parameter deciding section;
>
> [d] a receiving section that receives a signal containing data modulated and encoded on a per subband group basis at the communicating party using the modulation parameters and the coding parameters of the parameter information transmitted at the parameter information transmission section;
>
> [e] a data obtaining section that demodulates and decodes the received signal received at the receiving section on a per subband group basis using the modulation parameters and the coding parameters decided at the parameter deciding section, and obtains the data contained in the received signal; and
>
> [f] a pattern storage section that stores in advance patterns for selecting subbands constituting the subband groups wherein the parameter deciding section decides the modulation parameters and the coding parameters per subband group comprised of

[64] *Id.* at 1365–66.

> the subbands selected based on the patterns stored in the pattern storage section.

INVT asserted that compliance with the LTE communications standard required infringing this claim.[65] The key limitations in dispute were elements [d] and [e], which stated:[66]

> [d] a receiving section that receives a signal containing data modulated and encoded on a per subband group basis at the communicating party using the modulation parameters and the coding parameters of the parameter information transmitted at the parameter information transmission section;
>
> [e] a data obtaining section that demodulates and decodes the received signal received at the receiving section on a per subband group basis using the modulation parameters and the coding parameters decided at the parameter deciding section, and obtains the data contained in the received signal.

At the ITC, a dispute regarding the interpretation of these elements related to whether this language required "actual operation" or merely a "capability for performing" the recited function. The ITC determined that the language required actual operation based on the recitations "a receiving section that receives a signal" and "a data obtaining section that demodulates and decodes the received signal."[67] However, the ITC also determined that the language was not shown to be LTE-compliant and separately concluded that the accused devices had not been shown to meet the claim language at issue, regardless of whether it was LTE-compliant.[68]

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[65] *Id.* at 1371.
[66] *INVT SPE LLC*, 46 F.4th at 1368.
[67] *Id.*
[68] *Id.* at 1368–69.

On appeal, INVT challenged the interpretation of the claims as requiring actual operation. In this regard, the Federal Circuit agreed with INVT that the language required a "*capability for performing*" rather than "actual operation." However, it still concluded that the language had not been shown to be LTE-compliant and that the accused devices had not been shown to meet the limitations at issue.[69] Here, the Federal Circuit stated:

> Our cases have held that sometimes a device only needs to be "capable of operating" according to a claimed limitation, for a finding of infringement. Other times, a device does not infringe unless it actually operates as claimed. Whether infringement requires actual performance of the recited functions by the accused device depends on the claim language.
>
> Possibly the most straightforward example of this is the common distinction between method claims and apparatus claims. . . . We have construed some apparatus claims to require an infringing device to actually perform and operate according to the functional terms recited in the claim.
>
> . . . .
>
> In *Cross Medical*, ... the claim language "operatively joined" required that the interface and the bone segment be connected and in contact such that the device effectively performed posterior stabilization. Direct infringement did not occur until the device was connected to the bone, which a surgeon performed, not the allegedly infringing device maker.
>
> . . . .
>
> Because of the nature of the technology, computer and software claims typically use functional language

[69] *Id.* at 1367.

> to define the invention. Functional language is used to define and delimit otherwise generic or interchangeable general purpose computer hardware, which can be programmed to perform an unlimited array of functions. In other words, the recited operative steps a computer- or software-based device undertakes is what defines what a computer-implemented invention is. We have frequently construed such functional language as not requiring actual performance of those operative steps for infringement purposes. Moreover, we have not required claims to adhere to a specific grammatical form to find that the claim is drawn to capability,
>
> . . . .
>
> In fact, based on just claim language, we see very little significance in the difference between a limitation that might recite "a data obtaining section for demodulating and decoding" (*Finjan*-style) and one that recites "a data obtaining section that demodulates and decodes" (the actual '439 claim language), for determining on which side of the capability/actual-operation line the claims fall.
>
> . . . .
>
> In other words, the claims recite a device with the capability of performing the recited functions when in operation without any modification or further programming.[70]

Thus, the court interpreted the claim language, such as "a data obtaining section that demodulates and decodes" and "receiving section that receives a signal" to recite a device with the *capability of performing* the recited functions. This is in part because the language at issue involves a device using "software components with specific purposes," which is programmed to have the ability to

[70] *Id.* at 1371–75 (citations omitted).

perform the operative steps.[71] Despite this, however, the court affirmed non-infringement.

For our purposes, the court in *INVT* distinguished the user device from the base station using the language of claim 1 by saying the "communicating party" was interpreted as the base station: "[A]lthough the recited base station is not 'a limitation on the claimed invention itself, in the sense that an infringer would not need to, for instance, use, make, or sell the base station, the base station's operation affects whether the claims are met."[72] As the court explains, this is part of the environment of the invention:

> To determine whether an accused device is a device with the 'capability' of performing the recited functions, it must be able to perform those functions when it is activated and put into operation. Here, that means that the accused device receives and then decodes and demodulates a data signal with a particular claimed protocol—using the same parameters it had previously chosen. In this case, the user device's capability is dependent on the base station's capability.[73]

The court further explains:

> The base station is part of "the environment" in which the user device must function. The claims have specific requirements for the data signal that the user device's receiving section and data obtaining section handle and process when the device is activated and put into operation. That received data signal must be modulated and encoded with specific parameters—and not by the claimed user device but by a separate base station. To understand whether a user device can ever receive a data signal with the

[71] *Id.* at 1366, 1373–74.
[72] *INVT SPE LLC*, 46 F.4th at 1375 (citations omitted).
[73] *Id.* (citation omitted).

> particularized characteristics set forth in the claim, it is necessary to know whether the base station (i.e., the communicating party) can transmit that particular type of data signal to the user device. Therefore, although the recited base station is not "a limitation on the claimed invention itself," in the sense that an infringer would not need to, for instance, use, make, or sell the base station, the base station's operation affects whether the claims are met.[74]

If we look at the parts of the claim that refer to "communicating party," we are able to confirm our construct in this example. In claim 1, (c) and (d) state:

> [c] a parameter information transmission section that transmits, to a *communicating party*, parameter information indicating the modulation parameters and the coding parameters decided at the parameter deciding section;
>
> [d] a receiving section that receives a signal containing data modulated and encoded on a per subband group basis at the *communicating party* using the modulation parameters and the coding parameters of the parameter information transmitted at the parameter information transmission section.[75]

Therefore, the base station is a claim limitation and not a claim element. This is highly relevant for patent infringement. The base station does not need to be present for patent infringement, similar to the prior analysis of the CPU and system transfer bus for the hypothetical memory claims. Hence, the scope of the claim for purposes of patent infringement is broader because the base station is a claim limitation rather than a claim element.

We further see that this distinction between claim elements and claim limitations may also assist with

[74] *Id.* (citations omitted).
[75] *Id.* at 1366 (emphasis added).

understanding and drafting around so-called divided infringement. This may not seem like a groundbreaking distinction, but it does determine what is required for patent infringement based specifically on the claim language employed. It seems drafting claims with this distinction in mind may affect what needs to be present for patent infringement and, consequently, what may be worth reciting as an element versus a limitation as part of the claim drafting process.

As another way to look at the situation in *INVT v. ITC*, consider that the patent was alleged to be standard essential.[76] One would expect the patentee to prefer the broader interpretation, especially if the patent was an SEP. An issue that sometimes arises with SEP patents seems to be whether only the end user infringes or whether companies in the supply chain for SEP-compliant devices also infringe.[77] Whether one wants claims only infringed by the end user or wants claims that others in the supply chain for compliant devices to also infringe, in either case, it seems like divided infringement could be an issue if it is not fully considered when drafting the patent claims.

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[76] Standard Essential Patents (SEPs) refer to patents in which the invention requires compliance with a technical standard. *See id.* at 1366.

[77] In response to judicial doctrines, including the first-sale doctrine which prevents a patent holder from charging royalties at multiple levels of the distribution chain, Qualcomm developed a novel licensing strategy that came to be known as "No License, No Chips." It refused to license its patents to its competitors, but it waived its right to enforce them with respect to chips made by its competitors and sold to cellphone makers who had licensed the patents directly from Qualcomm. *See, e.g.*, Thomas Carey, *No License, No Chips: Qualcomm's Controversial Licensing Strategy is Not an Antitrust Violation*, SUNSTEIN INSIGHTS (Aug. 18, 2020), https://www.sunsteinlaw.com/publications/no-license-no-chips-qualcomm#:~:text=Qualcomm's%20practice%20of%20licensing%20its,in%20contract%20and%20patent%20law [https://perma.cc/ZU2C-A85Z].

For example, assume the user device did infringe, but the base station manufacturers were already licensed under the patent. If so, user devices sales would likely be impliedly licensed or would exhaust the patent, which explains why some organizations with SEP patents only want to license end users, at least during their first round of licensing.[78] Although SEP legal issues is a much more complex topic, Example 4 at the end of Section 4 provides an illustration in which claims are drafted to capture wireless providers without divided infringement, despite the end user technically being the actual infringer.

However, is this distinction between claim elements and claim limitations clear? Without question, it is subject to interpretation, particularly by a federal court. Likewise, clarity of the claim drafter may make a significant difference. Some claim language situations may, by their nature, be clearer than others.

Some analysis of the claim in *Advance Software Design* may be enlightening in this regard. In this case, Advanced Software and Fiserv offered competing products for preventing check fraud and forgery.[79] The products generally worked by encrypting selected information on a check, such as the name of the payee or the amount of the check, and printing the encrypted information on the check.[80] When someone attempted to cash a protected check, the products validated the check by decrypting it and comparing the information to the corresponding unencrypted information that had been entered on the check. If the decrypted information did not match the selected unencrypted information on the check, the check

[78] *Id.*
[79] Advanced Software Design Corp. v. Fiserv, Inc., 641 F.3d 1368, 1371 (Fed. Cir. 2011).
[80] *Id.* at 1371–72.

was deemed fraudulent or forged and would not be cashed.[81]

The district court issued summary judgment of noninfringement for the Advanced Software Design patent, patent '110. The district court construed the asserted claims of the '110 patent as requiring all three steps—encrypting, printing, and validating.[82] Because Fiserv did not direct or control the encrypting or printing steps, the court concluded that there could be no direct infringement under the Federal Circuit decisions in *BMC Resources, Inc. v. Paymentech, L.P.* and *Muniauction, Inc. v. Thomson Corp.*[83] The claim at issue, claim 1,[84] stated:

> 1. A process of validating a negotiable financial instrument made by a payor, in which selected information found on the financial instrument which varies for each instantiation of the financial instrument made by the same payor is encrypted in combination with key information not found on the financial instrument to generate a control code which is printed on the financial instrument along with the selected information, the process comprising:
>
> reading the selected information from the financial instrument; and one of
>
> (i) decrypting the control code to thereby obtain decrypted information whereby the cheque validator may refuse to honor the financial instrument if the selected information found on the financial instrument does not match the decrypted information, and
>
> (ii) re-encrypting the selected information as presented on the financial instrument to re-obtain a

[81] *Id.* at 1371.
[82] *Id.* at 1372.
[83] *Id.*
[84] Claim 9 was also at issue, but it was the corresponding apparatus claim with similar results.

> second control code, whereby the cheque validator may refuse to honor the financial instrument if the second control code does not match the control code printed on the financial instrument.[85]

This issue concerned the preamble of the claim. Preambles are not necessarily limiting;[86] however, the parties agreed that the preamble was limiting.[87] The debate, consequently, was whether the preamble *must* be performed by the accused infringer for patent infringement. Here, we employ the distinction between a claim element and a claim limitation. The language of the preamble in this construct amounted to limitations. The claim states:

> [S]elected information found on the financial instrument which varies for each instantiation of the financial instrument made by the same payor is encrypted in combination with key information not found on the financial instrument to generate a control code which is printed on the financial instrument along with the selected information . . . .[88]

However, this language was introduced by "in which," which is similar to "wherein," using the suggested analysis provided earlier in this section between "wherein" and "further comprising." The body of the method claim, on the other hand, begins: "[R]eading the selected information from the financial instrument . . . ." [89] And the claim body further states:

> and one of

[85] *Advanced Software Design Corp.*, 641 F.3d at 1373.
[86] *See, e.g.*, Catalina Mktg. v. Coolsavings.com, 289 F.3d 801, 808 (Fed. Cir. 2002).
[87] *Advanced Software Design Corp.*, 641 F.3d at 1373.
[88] *Id.*
[89] *Id.*

> (i) decrypting the control code to thereby obtain decrypted information whereby the cheque validator may refuse to honor the financial instrument if the selected information found on the financial instrument does not match the decrypted information, and
>
> (ii) re-encrypting the selected information as presented on the financial instrument to re-obtain a second control code, whereby the cheque validator may refuse to honor the financial instrument if the second control code does not match the control code printed on the financial instrument.[90]

"Decrypting" and "re-encrypting" are claim elements along with "reading." As a preamble, the accused infringer did not necessarily need to perform it for patent infringement. Likewise, this also did *not* amount to divided infringement because these limitations were not required to be performed within the scope of *this claim*. The Federal Circuit stated:

> We consider only whether Fiserv could 'use' the claimed inventions by validating checks with Secure Seal or using a system comprising a scanner and a computer running Secure Seal to validate checks. . . . Fiserv therefore could "use" the method of claim 1 by validating checks even though it does not encrypt and print them. It would infringe the method of claim 1, however, only by validating checks that have been encrypted and printed in accordance with steps described in the preamble.[91]

In this case, then, using the claim element/claim limitation construct, the preamble was limiting and needed to be met; however, it did not need to be performed by the accused infringer, and the claim did not present a divided

[90] *Id.*
[91] *Id.* at 1374.

infringement case. Rather, the preamble specified claim limitations, as opposed to claim elements, for the financial instrument of the claim. These limitations in the preamble were "attendant circumstances" needed for patent infringement.

This case demonstrates that how claim elements and claim limitations may be parsed is a matter of claim interpretation. In many cases, the distinction is clear, whereas in others it may be subject to argument and involve a significant amount of claim language subtlety. Despite this, the distinction, when applied, provides valuable insights to claim analysis and may be useful in claim drafting.

III. DIVIDED PATENT INFRINGEMENT

Surprisingly, the single infringer doctrine, or divided infringement, does not have a long historical pedigree in patent case law.[92] However, before Federal Circuit cases that addressed it were handed down, patent claim drafters at least instinctively knew that a single entity must, in effect, perform all the elements and limitations of a claim for patent infringement liability. This follows logically from the "all elements" or "all limitations" rule,

[92] *See* 5 DONALD S. CHISUM, CHISUM ON PATENTS § 16.02 (2024). For the purposes of this article, divided patent infringement refers to a situation in which, because no single party completes all the elements and limitations of the patent claim, no one is liable for patent infringement of the patent claim. Joint patent infringement is a similar concept in that multiple parties perform all the elements and limitations of a patent claim. Technically, no single party completes all the elements and limitations. However, for the purposes of this article, joint patent infringement refers to a situation where, on policy grounds—such as the multiple parties being related in some way—all the elements and limitations are attributable to at least one party, resulting in a finding of patent infringement and liability.

but just as well from the language of 35 USC § 271(a), referring to "any patented invention."[93]

The point that claims should cover a single infringer, but do not, is a common claim drafting error and may be fatal to a claim for patent infringement.[94] The widely known Federal Circuit case to directly state the principle appears to be *BMC Resources v. Paymentech*.[95] The court also acknowledged in its opinion that a so-called "corner case" may exist in which the actions of one party are directed by another.[96]

However, if the parties are operating independently of one another to provide all the elements and limitations of the claim, then there would be no patent infringement liability. For this reason, as the appellate court in *BMC* suggests, claims should be written from the perspective of a single party.[97]

Not long after *BMC Resources*, the Federal Circuit decided *Muniauction*.[98] In *Muniauction*, the question involved was whether there was "direction and control" by one party of another, an issue alluded in *BMC*. The Federal Circuit found divided patent infringement rather than joint

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[93] *See* 35 U.S.C. § 271; Warner-Jenkinson Co. v. Hilton Davis Co., 520 U.S. 17, 40 (1997) (holding that the doctrine of equivalents, like literal infringement, must be tested element by element); Canton Bio-Med., Inc. v. Integrated Liner Techs., Inc., 216 F.3d 1367, 1370 (Fed. Cir. 2000); Gen. Foods Corp. v. Studiengesellschaft Kohle mbH, 972 F.2d 1272, 1274 (Fed. Cir. 1992) (explaining that for process patent or method patent claims, infringement occurs when a party performs all of the acts of the process); Joy Techs., Inc. v. Flakt, Inc., 6 F.3d 770, 773 (Fed. Cir. 1993); Grow, *supra* note 48, at 6–11.

[94] *See*, *e.g.*, Robinson, *supra* note 50, at 336.

[95] *See* BMC Res., Inc. v. Paymentech, L.P., 498 F.3d 1373, 1378 (Fed. Cir. 2007).

[96] *Id.* at 1381.

[97] *Id.*

[98] *See* Muniauction, Inc. v. Thomson Corp., 532 F.3d 1318, 1329 (Fed. Cir. 2008).

patent infringement using a "control or direction" test.[99] Observe that a similar "direction and control" test arises under use infringement of a system claim.[100] However, it is noted that in *Akamai Techs. v. Limelight*,[101] the court, en banc, clarified and broadened the requirements for joint infringement compared to divided infringement.[102] In accordance with *Akamai*, either direction and control *or* joint enterprise is sufficient for liability under section 271(a). However, the court clarified the scope of "direction and control," stating: "[L]iability under § 271(a) can also be found when an alleged infringer conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance."[103]

The divided/joint patent infringement issue may arise in a host of possible situations; however, it has become particularly prevalent because a variety of networking-type technologies may involve client and server interactions in which the client and the server are operated by otherwise independent parties.[104] For example, long before Apple Music and similar services, there was Napster. Napster is credited with being the first peer-to-peer network for sharing music. Putting copyright issues aside, before Napster, others had the idea for peer-to-peer sharing of

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[99] *Id*. at 1328–30.

[100] *See* NTP, Inc. v. Research In Motion, Ltd., 418 F.3d 1282, 1316 (Fed. Cir. 2005); Centillion Data Sys., LLC v. Qwest Communs. Int'l, 631 F.3d 1279, 1282 (Fed. Cir. 2011); Robinson, *supra* note 50, at 348–63 (discussing "direct and control" standard from *BMC* and *Muniauction*).

[101] Akamai Techs., Inc. v. Limelight Networks, Inc., 797 F.3d 1020, 1023 (Fed. Cir. 2015) (en banc).

[102] *See id.* at 1022–23.

[103] *Id.*

[104] *See* Robinson, *supra* note 50, at 340; Grow, *supra* note 48, at 5–6.

digital music and may very well have attempted to obtain patent protection. Thus, consider this example claim:

EXAMPLE 3

I claim:

1. A method of sharing digital music comprising:

initiating and establishing a network connection from a first computer to a second computer; and

sharing one or more digital music files on the second computer with the first computer via the network connection so that the first computer is able to independently play the shared one or more digital music files.

Of course, this claim might raise several issues today, including, perhaps, patent eligibility. Even at the time of Napster, there might have been a question of subject matter obviousness. However, we put those issues aside for purposes of illustration.

The claim follows a standard approach in that a user somewhere wants to create a network connection with a second computer (e.g., server) that stores digital music so that music on the second computer may be copied and played on the first computer. However, divided patent infringement is implicated because the user controls the first computer, while "the music service" controls the second computer.

It would also not be fair to say that *no one* necessarily infringes this claim. Rather, an entity or person that owns or directs and controls both the first and the second computer may likely infringe. Of course, detecting such infringement may also be problematic. However, it might be possible to argue with evidence that Sony, for

example, infringes if Sony is transporting digital music between its servers in the manner claimed.

Could one argue that Sony infringes when a user downloads music from its servers? We assume Sony provides software to assist in downloading such music. However, could it be argued that Sony initiates and establishes the network connection? It seems it is the user that initiates the network connection (i.e., the first computer), granted that the details of the technology may matter here. Is the user under Sony's direction and control? Perhaps, if Sony provided the software, but that may also be a stretch of "direction and control." Sony probably performs the second operation of sharing the one or more digital music files. Thus, it might have been possible to draft a claim that would more clearly be infringed had it been written from the appropriate perspective. For example, if the first computer initiates and establishes the network connection, then it should be claimed that the first computer is *receiving* digital music files from the second computer to be played on the first computer. In that case, liability for direct infringement would rest on the first computer without mental gymnastics about who may be controlling whom.

In general, the notion of divided infringement is that the patent claim calls for something the entity performing the claim is unable to perform. That was the situation in the claim of Example 3. Rather, for divided infringement, someone who is *not* under the direction and control of the entity performing the claim is required to, in essence, perform or meet a *claim element.* In this example, the second computer is likely not under the direction and control of the first computer. Conversely, for joint infringement, someone else who *is* under the direction and

control of the entity performing the claim may be required to, in essence, perform or meet a *claim element*.[105]

IV. APPLICABILITY TO PATENT CLAIM DRAFTING AND PATENT CLAIM ANALYSIS

Let us now consider the claim from *BMC Resources*.[106] A close reading of the claim itself suggests a divided infringement issue. For example, claim 6 of the patent at issue states:

> A method of paying bills using a telecommunications network line connectable to at least one remote payment card network via a payee's agent's system wherein a caller begins a session using a telecommunications network line to initiate a spontaneous payment transaction to payee, the method comprising the steps of:
>
> prompting the caller to enter a payment number from one or more choices of credit or debit forms of payment;
>
> prompting the caller to enter a payment amount for the payment transaction;
>
> accessing a remote payment network associated with the entered payment number, the accessed remote payment network determining, during the session, whether sufficient available credit or funds exist in an account associated with the payment number to complete the payment transaction, and upon a determination that sufficient available credit or funds exist in the associated account, charging the entered payment amount against the account with the entered

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[105] *See* Grow, *supra* note 48, at 6–11; Katie Silikowski, *A Methodological Look at Divided Infringemen*t, 15 J. MARSHALL REV. INTELL. PROP. L. 779, 786 (2016).

[106] BMC Res., Inc. v. Paymentech, L.P., 498 F.3d 1373 (Fed. Cir. 2007).

> payment number, adding the entered payment amount to an account associated with the entered account number, and storing the account number, payment number and payment amount in a transaction file of the system.[107]

The preamble recites a "caller," a "telecommunications network line" (which does not seem to be used in the claim body, but is mentioned again in the preamble), a "remote payment card network," and a "payee's agent's system."[108]

The claim language is slightly confusing, but it appears that a caller calls a payee's agent's system and enters a credit card number or a debit card number and an amount that needs to be paid. A network, the "remote payment network," associated with the credit or debit card is accessed by the payee's agent's system to determine if sufficient funds or credit is available and, if so, the credit or debit account is charged to pay the payee, and the charge is added to the caller's credit or debit account.

Here, the claim appears to require the agent system to do one thing while the remote payment network, operating independent of the agent, performs something else. Thus, there is at least divided infringement between Paymentech and the remote payment network, assuming that Paymentech is the payee's agent. The "prompting" claim elements are performed by the payee's agent's system with respect to the caller. Likewise, the element "accessing" is intended to be performed by the payee's agent's system.

The problem is that the claim includes other elements performed by entities not owned or controlled by the payee's agent's system. For example, a claim element is "determining, during the session, whether sufficient

[107] *Id.* at 1376.
[108] *Id.*

available credit or funds exist in an account associated with the payment number to complete the payment transaction," which is done by the "accessed remote payment network." Another claim element performed by the "accessed remote payment network" is "charging the entered payment amount against the account with the entered payment number, adding the entered payment amount to an account associated with the entered account number." Yet another element performed by the "accessed remote payment network" is "storing the account number, payment number and payment amount in a transaction file of the system." Here, we have been loose by referring to these entire phrases as elements when some parts may be understood as limitations. However, we can be sure, since this is a method claim, claim elements are at least "determining," "charging," and "storing." Further, it is made clear these are performed by the "accessed remote payment network."

The case presents a standard example of divided infringement by multiple parties of a single claim. The appellate court seemed to require direction and control by one party to find joint infringement, relying in part on the law of vicarious liability. It stated:

> [T]he law imposes vicarious liability on a party for the acts of another in circumstances showing that the liable party controlled the conduct of the acting party. . . . Courts faced with a divided infringement theory have also generally refused to find liability where one party did not control or direct each step of the patented process. . . . A party cannot avoid infringement, however, simply by contracting out steps of a patented process to another entity. In those cases, the party in control would be liable for direct infringement.[109]

[109] *Id.* at 1379.

BMC would have needed to show that Paymentech was able to direct and control the actions of the remote payment card network so that payment takes place. The appellate court stated:

> This court acknowledges that the standard requiring control or direction for a finding of joint infringement may in some circumstances allow parties to enter into arms-length agreements to avoid infringement. . . . The concerns over a party avoiding infringement by arms-length cooperation can usually be offset by proper claim drafting.[110]

The appellate court seems to suggest that parties may cooperate without a single party having direction and control.[111] The court's arms-length cooperation hypothetical seems to suggest that two parties may contract in a manner that may not result in direct infringement because there may not be sufficient direction and control by one party. The appellate court's view, then, is that in such a case, there is no patent infringement.[112] But this aspect of

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[110] *Id.* at 1381.

[111] *Id.* at 1381.

[112] *See BMC Res.*, 498 F.3d at 1381; Jingyuan Lou, *Concluding the Akamai Chapter of Divided Infringement: Is the Liability Loophole Closed?*, 31 BERKELEY TECH. L.J. 467, 484 (2016) stating:

> In order to understand why the Federal Circuit struggled, and before evaluating the decision in *Akamai*, it is useful to reiterate the doctrinal challenge in divided infringement. The primary dilemma in crafting a rule for divided infringement is ensuring that the rule is broad enough to capture actors who attempt to evade liability by dividing performance of a method patent with parties that neither direct nor control, yet narrow enough to protect the inadvertent, non-infringing acts of innocent third parties.

the case appears to have been modified by later cases, such as *Muniaction* and *Akamai*.[113]

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[113] *See* Muniaction v. Thompson Corp., 532 F.2d 1318, 1528 (Fed. Cir. 2008); *see also* Akamai Techs., Inc. v. Limelight Networks, Inc., 797 F.3d 1020, 1022–23 (Fed. Cir. 2008) stating:

> Where more than one actor is involved in practicing the steps, a court must determine whether the acts of one are attributable to the other such that a single entity is responsible for the infringement. (quoting BMC Res., Inc., v. Paymentech, L.P., 498 F.3d 1373, at 1379–81 (Fed. Cir. 2007). We will hold an entity responsible for others' performance of method steps in two sets of circumstances: (1) where that entity directs or controls others' performance, and (2) where the actors form a joint enterprise. To determine if a single entity directs or controls the acts of another, we continue to consider general principles of vicarious liability. (citation omitted). In the past, we have held that an actor is liable for infringement under § 271(a) if it acts through an agent (applying traditional agency principles) or contracts with another to perform one or more steps of a claimed method. (citation omitted).
>
> We conclude, on the facts of this case, that liability under § 271(a) can also be found when an alleged infringer conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance. *Cf.* Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd., 545 U.S. 913, 930, 125 S. Ct. 2764, 162 L. Ed. 2d 781 (2005) (stating that an actor "infringes vicariously by profiting from direct infringement" if that actor has the right and ability to stop or limit the infringement). In those instances, the third party's actions are attributed to the alleged infringer such that the alleged infringer becomes the single actor chargeable with direct infringement. Whether a single actor directed or controlled the acts of one or more third parties is a question of fact, reviewable on appeal for substantial evidence, when tried to a jury.
>
> Alternatively, where two or more actors form a joint enterprise, all can be charged with the acts of the other, rendering each liable for the steps performed by the other as if each is a single actor. (quoting Restatement (Second) of Torts § 491 cmt. *b* ("The law . . . considers that each is the agent or servant of the others, and that the act of any one within the scope of the enterprise is to be

The *BMC* court, however, suggests that this conundrum may be solved with drafting the claims from the perspective of a single party.[114] This is, of course, correct. However, might the distinction made earlier between a claim element and a claim limitation also provide some insight into accomplishing that? Is there a way the claim in *BMC* might have been drafted to avoid divided infringement? Perhaps something like:

> A method comprising:
>
> calling a payee's agent's network; and
>
> entering an identified debit or credit card network, an account and a payment amount;
>
> wherein the payee's agent's network receives the payment amount from the identified credit or debit card network account.

What may not be intuitively obvious is that divided infringement is avoided simply by using a claim *limitation* in place of previous claim *elements*. Note that in the claim, the debit or credit network does not appear to necessarily

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charged vicariously against the rest."). A joint enterprise requires proof of four elements:

(1) an agreement, express or implied, among the members of the group;
(2) a common purpose to be carried out by the group;
(3) a community of pecuniary interest in that purpose, among the members; and
(4) an equal right to a voice in the direction of the enterprise, which gives an equal right of control.

(citation omitted). As with direction or control, whether actors entered into a joint enterprise is a question of fact, reviewable on appeal for substantial evidence. (citation omitted). ("Whether these elements exist is frequently a question for the jury, under proper direction from the court.").

[114] *See BMC Res.*, 498 F.3d at 1381.

do any specifically required acts. Instead, the payee's agent's network "receives" the payment amount.

What is happening is that several claim elements are replaced by a claim limitation that is ostensibly performed by the entity otherwise performing the claim (in comparison to elements of the claim in *BMC*).[115] The "identified credit or debit card network account" is recited as a limitation because "payee's agent's network *receives* the payment amount from the identified credit or debit card network account." This is analogous with those previous memory examples, in which Example 1 was infringed by the memory and memory controller, whereas infringement of Example 2 required the memory, memory controller, CPU, and system transfer bus—except that this involves a method claim, whereas the previous memory examples involve apparatus claims.

A similar analysis follows for *Advanced Software Design* discussed in Section 3.[116] As previously discussed, it is relatively clear in some cases which parts of the patent claim are claim elements and which parts are claim limitations. Likewise, in other cases, it may not be as clear, and some amount of claim interpretation may come into play. However, these cases illustrate that comprehending the patent claim as claim elements and claim limitations provides a workable approach that fully aligns with court decisions interpreting the claim for patent infringement purposes, including how to comprehend the claim to assess the presence of divided patent infringement.[116]

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[115] *See* CHISUM, *supra* note 91, at § 60.4; s*ee also* Robinson, *supra* note 50, at 367–68.

[116] *See* Advanced Software Design Corp. v. Fiserv, Inc., 641 F.3d 1368, 1374 (Fed. Cir. 2011).

[116] *Compare* Advanced Software Design Corp. v. Fiserv, Inc., 641 F.3d 1368, 1374 (Fed. Cir. 2011), *with* Uniloc USA Inc. v. Microsoft Corp., 632 F.3d 1292, 1302 (Fed. Cir. 2010) (While *Advanced Software Design Corp.* provided a claim that was relatively easy to interpret in

Another Federal Circuit case that has received attention is *Eli Lilly & Co. v. Teva Parenteral Meds., Inc.*,[117] a divided infringement case after *Akamai*.[118] This case raises the divided infringement issue in a pharmaceutical context. The '209 patent related to methods of administering the chemotherapy drug pemetrexed disodium ("pemetrexed") after pretreatment with two common vitamins—folic acid and vitamin B12. Pemetrexed is an antifolate that kills cancer cells by inhibiting the function of folates, a class of nutrients necessary for cell reproduction.[119] The purpose of the dual vitamin pretreatments is to reduce the toxicity of pemetrexed in patients.[120] Eli Lilly markets pemetrexed under the brand name ALIMTA ®, and the drug is used to treat certain types of lung cancer and mesothelioma.[121]

Around 2008-2009, defendants notified Eli Lilly that they had submitted Abbreviated New Drug Applications ("ANDAs") seeking approval by the Food and Drug Administration ("FDA") to market generic versions of ALIMTA®.[122] After the '209 patent issued, defendants sent Eli Lilly additional notices regarding their ANDAs, including notices that they had filed Paragraph IV certifications under 21 U.S.C. § 355(j)(2)(A)(vii)(IV), declaring that the '209 patent was invalid, unenforceable, or would not be infringed.[123] Eli Lilly subsequently brought a consolidated action against defendants for

terms of elements and limitations, the claim of *Uniloc* may be more challenging for a court).

[117] 845 F.3d 1357 (Fed. Cir. 2017).

[118] *Akamai*, 797 F.3d at 1020.

[119] Eli Lilly & Co. v. Teva Parenteral Meds., Inc., 845 F.3d 1357, 1361 (Fed. Cir. 2017).

[120] *Id.* at 1362

[121] *Id.*

[122] *Id.*

[123] *Id.*

infringement under 35 U.S.C. § 271(e)(2).[124] Specifically, Eli Lilly alleged that defendants' generic drugs would be administered with folic acid and vitamin B12 pretreatments and would thus result in infringement of the '209 patent. Defendants raised noninfringement and invalidity defenses.[125] Claim 12, as an example, is independent and recites:[126]

> 12. An improved method for administering pemetrexed disodium to a patient in need of chemotherapeutic treatment, wherein the improvement comprises:
>
> a) administration of between about 350 µg and about 1000 µg of folic acid prior to the first administration of pemetrexed disodium;
>
> b) administration of about 500 µg to about 1500 µg of vitamin B12, prior to the first administration of pemetrexed disodium; and
>
> c) administration of pemetrexed disodium.

The court stated:

> Where, as here, no single actor performs all steps of a method claim, direct infringement only occurs if "the acts of one are attributable to the other such that a single entity is responsible for the infringement." The performance of method steps is attributable to a single entity in two types of circumstances: when that entity "directs or controls" others' performance, or when the actors "form a joint enterprise." Eli Lilly did not pursue a joint enterprise theory, so the question of direct infringement before us is whether

[124] *Id.*
[125] *Eli Lilly & Co.*, 845 F.3d at 1362.
[126] *Id.* at 1363–64.

> physicians direct or control their patients' administration of folic acid.[127]

Ultimately, the court decided that the test of *Akamai* was met, which amounted to direct infringement by the physicians.[128] The court stated:

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[127] *Id.* at 1364 (citations omitted).

[128] *Id.* at 1366–67. The court stated:

> The record is thus replete with evidence that physicians delineate the step of folic acid administration that patients must perform if they wish to receive pemetrexed treatment.
>
> Defendants argue that mere guidance or instruction is insufficient to show "conditioning" under *Akamai*[]. But the evidence regarding the critical nature of folic acid pretreatment and physicians' practices support a finding that physicians cross the line from merely guiding or instructing patients to take folic acid to conditioning pemetrexed treatment on their administration of folic acid. If a patient does not take folic acid as instructed, a physician, in his or her discretion, need not provide pemetrexed treatment based on the patient's failure to perform the step of folic acid administration. Defendants also complain that there is no evidence that physicians go further to "verify compliance" with their instructions or to 'threaten' denial of pemetrexed treatment. Conditioning, however, does not necessarily require double-checking another's performance or making threats.
>
> We also reject Defendants' argument that an actor can only condition the performance of a step "by imposing a legal obligation to do so, by interposing that step as an unavoidable technological prerequisite to participation, or, as in [*Akamai*], both." In *Akamai*, we found "conditioning," based on evidence that the defendant required all of its customers to sign a standard contract delineating the steps that customers had to perform to use the defendant's service. But we did not limit "conditioning" to legal obligations or technological prerequisites. We cautioned that "principles of attribution are to be considered in the context of the particular facts presented" and even expressly held that § 271(a) infringement "is not limited solely to principal-agent relationships, contractual arrangements, and joint enterprise."

> Although we conclude that the two-prong *Akamai* test is met here, this does not end our inquiry. "The mere existence of direct infringement by physicians, while necessary to find liability for induced infringement, is not sufficient for inducement" (quoting *Takeda Pharms. USA, Inc. v. West-Ward Pharm. Corp.*, 785 F.3d 625, 631 (Fed. Cir. 2015)). To show inducement, Eli Lilly carries the burden of further proving "specific intent and action to induce infringement" (citation omitted). Mere "knowledge of the acts alleged to constitute infringement" is not sufficient (quoting *DSU Med.*, 471 F.3d at 1305).[129]

At this point, however, the case is like any other inducing infringement case in the pharmaceutical context. Here, the court correctly states:

> We make two observations at the outset. First, to be clear, the intent for inducement must be with respect to the actions of the underlying direct infringer, here physicians. Second, we have not required evidence regarding the general prevalence of the induced activity. When the alleged inducement relies on a drug label's instructions, "[t]he question is not just whether [those] instructions describ[e] the infringing mode . . . but whether the instructions teach an infringing use *such that* we are willing to infer from those instructions an affirmative intent to infringe the patent" (quoting *Takeda*, 785 F.3d at 631). "The label must encourage, recommend, or promote infringement."(citation omitted). For purposes of inducement, "it is irrelevant that some users may ignore the warnings in the proposed label" (quoting *AstraZeneca LP v. Apotex, Inc.*, 1042, 1060 (Fed. Cir. 2010)).[130]

The product labeling, combined with the testimony discussed above, provide sufficient evidence that physicians condition pemetrexed treatment on folic acid pre-treatment.

[129] *Id.* at 1368.

[130] *Id.*

Thus, the court was able to find induced infringement based on direct patent infringement as a result of joint infringement.

Per the *Lou* article, one might ask: Does this case "ensur[e] that the rule is broad enough to capture actors who attempt to evade liability by dividing performance of a method patent with parties they neither direct nor control, yet narrow enough to protect the inadvertent, non-infringing acts of innocent third parties?"[131] That, of course, is a challenging question, and it seems that commentators are not uniformly agreed on the scope of liability for joint infringement.[132]

However, rather than exploring that knotty question, we instead ask whether the previously described distinction between a claim element or a claim limitation might have led to a claim that was directly infringed, while sidestepping the complex joint or divided infringement analysis of the situation. It has previously been pointed out by others that a differently drafted claim would have helped.[133] However, there may be challenges in applying the new *Akamai* rule, on its face, to cover joint infringement of medical diagnostic patents.[134] For

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[131] Lou, *supra* note 111, at 484.

[132] *See generally id.* at 493; Robinson, *supra* note 50, at 367–68; Grow, *supra* note 48, at 6–11; Silikowski, *supra* note 104.

[133] *See* Silikowski, *supra* note 104, at 795 ("Instead of method claims directing the patient to take the pemetrexed disodium, the claims could be written from the perspective of the doctor.").

[134] *See* Lou, *supra* note 111, at 491–92:

> Unlike in Eli Lilly, where it was relatively simple for a court to identify the physicians as the direct infringers - because the physicians completed nearly every step of the disputed method patent, and because the patients taking of folic acid in a manner specified by their physicians was a condition of participation and necessary to achieve the benefit of the treatment - it is unclear whether the physician, independent testing laboratory, or both (under a joint enterprise theory) could be liable for direct infringement in this context.

example, as previously discussed, asserted independent claim 12 stated:

> 12. An improved method for administering pemetrexed disodium to a patient in need of chemotherapeutic treatment, wherein the improvement comprises:
>
> a) administration of between about 350 µg and about 1000 µg of folic acid prior to the first administration of pemetrexed disodium;
>
> b) administration of about 500 µg to about 1500 µg of vitamin B12, prior to the first administration of pemetrexed disodium; and
>
> c) administration of pemetrexed disodium.[135]

It should be clear that the "administration" called for by a, b, and c constitute claim elements. Looking at the claim, we just need to rewrite element "a" as a claim limitation. For example:

> 12. An improved method for administering pemetrexed disodium to a patient in need of chemotherapeutic treatment, wherein the improvement comprises:
>
> a) administration of about 500 µg to about 1500 µg of vitamin B12 such that ingestion of between about 350 µg and about 1000 µg of folic acid occurs concurrently with, before and/or after the foregoing administration, all of the foregoing taking place prior to the first administration of pemetrexed disodium; and
>
> b) administration of pemetrexed disodium.

[135] *Eli Lilly & Co.*, 845 F.3d at 1363–64.

Now consider the next, more complex networking technology related example. So-called visual voicemail, the feature in which voicemails are transcribed so that the party to whom the voicemail is directed may read the content rather than listen to it, was invented well before the introduction of the iPhone. Visual voicemail, when invented, was one feature of an overall voicemail management system with an inbox—somewhat similar to, but distinctly separate from, an email inbox. At the time of the invention, cellphone voicemail capability was limited to serially going through and listening to voicemail messages forwarded to a wireless handset from a voicemail server.

In general, the innovation was also directed to a wireless handset that receives transcribed voicemails from a voicemail server and displays partial transcriptions in a voicemail inbox. Later, some versions permitted transcription by the wireless handset. The handsets transcribe and display in a voicemail inbox received voicemails that a mobile device has at least partially transcribed.

For example, in this former approach, a wireless carrier may include charges for a transcription service included with its voicemail service.[136] The wireless carrier may employ a voicemail server with the capability to transcribe audio voicemails and then forward the audio voicemail and the transcription to a wireless handset. If the wireless subscriber has signed up for the transcription service, the wireless carrier would also provide software executable on the wireless handset to handle the processing and display of the voicemails—along with their associated, at least partial, transcriptions—as part of a voicemail inbox.

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[136] *See Visual Voicemail FAQs*, VERIZON, https://www.verizon.com/support/visual-voice-mail-faqs/ [https://perma.cc/4RR5-JJYU] (Verizon charges depending on the service and phone).

The question might be how to draft a method claim intended to capture wireless providers of such a voicemail transcription service—based on use of the service by one or more subscribers—*without divided infringement*, due to the need to display the inbox on the mobile device. Claim 1 of example 4 potentially accomplishes that.

EXAMPLE 4

I claim:

1. A method of processing voicemail messages at a voicemail server, the method comprising:

capturing a plurality of received voicemail messages in an audio format to provide a plurality of audio-formatted voicemail messages;

converting the plurality of audio-formatted voicemail messages to a plurality of corresponding text representations of the voicemail messages; and

initiating communication of the text representations of the voicemail messages and the audio-formatted voicemail messages to a mobile device, wherein a respective text representation comprises a representation of an at least partial text transcription of a corresponding converted audio-formatted voicemail message, the at least partial text transcriptions of the voicemail messages to be displayable via a visual voicemail inbox of a voicemail system integrated as part of the mobile device.

2. The method of claim 1, and further comprising:

receiving and processing the plurality of text representations for display of the at least partial text transcriptions via the visual voicemail inbox of the voicemail system integrated as part of the mobile device.

3. The method of claim 1, wherein the initiating communication of the text representations of the voicemail messages and the audio-formatted voicemail messages to the mobile device further includes initiating communication of one or more voicemail identifiers for respective voicemail messages of the plurality of voicemail messages, the one or more voicemail identifiers also displayable with the at least partial text transcriptions via the visual voicemail inbox as one or more visual voicemail indicators.
4. The method of claim 3, wherein, for a particular voicemail message, the one or more displayable visual voicemail indicators include at least one of the following: a time of a telephone call associated with the particular voicemail message; a date of the telephone call associated with the particular voicemail message; and/or a telephone number for the telephone call associated with the particular voicemail message.
5. The method of claim 3, wherein the initiating communication further includes initiating communication of a plurality of telephone numbers associated with the plurality of voicemail messages, the telephone numbers displayable via the visual voicemail inbox as one of the one or more visual voicemail indicators in a manner so that the telephone numbers are selectable to call at least one of the telephone numbers.
6. The method of claim 1, wherein the initiating communication comprises initiating communication of one or more voicemail identifiers for respective voicemail messages to the mobile device displayable via the visual voicemail inbox as one or more visual voicemail indicators for respective voicemail messages along with the at least partial text transcription of the respective voicemail messages via the visual voicemail inbox of the voicemail system integrated as part of the mobile device.
7. The method of claim 1, wherein the initiating communication further includes initiating communication

of the text representations of the voicemail messages and the audio-formatted voicemail messages, wherein the text transcriptions respectively comprise an at least partial text transcription displayable in a manner so that a displayable telephone number in at least one of the at least partial text transcriptions is selectable to call the telephone number that is displayable.

Appreciate the tricky part to drafting this claim and the hook it provides vis-à-vis wireless carriers. Ultimately, the innovation here is associated with the display of one or more, at least partial, transcriptions in a voicemail inbox (i.e., separate from an email inbox) on a wireless handset. It is true that wireless carriers, like AT&T do sell handsets; however, the handsets are manufactured by others, such as Samsung.[137] Furthermore, it is likely that a wireless carrier selling a handset manufactured by someone else obtains a contractual indemnity against patent infringement.

How do we capture the wireless providers in a core business, such as wireless services, since they do not actually perform the displaying and related actions? As suggested in Example 4, the wireless provider must not only transcribe the audio voicemails, but it must also send "at least partial transcriptions" in a *format* capable of being displayed by a handset. There is really no way around doing that in the model of forwarding a transcription described.

The claim, therefore, has specific language directed to a "text representation" of the voicemail message as "a representation of an at least partial text transcription" in which the "at least partial text transcriptions of the voicemail messages [are] to be displayable via a visual

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[137] *See* AT&T, https://www.att.com/buy/phones/ [https://perma.cc/5R9D-CCKC].

voicemail inbox of a voicemail system integrated as part of the mobile device." Thus, regardless of the *format* (i.e., "representation" in the claim) sent, a *communication* that is *convertible* to an at least partial text transcription by a wireless handset would appear to otherwise meet the language of the claim. *However, how does the claim avoid divided infringement between the server and the mobile device (e.g., handset)?*

In Example 4, the elements of claim 1 are all performed by the server. The language "at least partial text transcriptions of the voicemail messages to be displayable via a visual voicemail inbox of a voicemail system integrated as part of the mobile device" is a claim limitation rather than a claim element. It is like the base station in *INVT*,[138] although that was an apparatus claim, and this is a method claim. The, at least partial, text transcriptions of the voicemail messages need to meet the limitation, but the voicemail inbox of the mobile device, as such, is not required to be present for patent infringement of claim 1.

Claims 1 and 3–7 do not involve divided infringement. However, claim 2 arguably has a potential divided infringement issue. What is the difference? Claim 2 adds another element to be performed, "receiving and processing . . . as part of the mobile device."[139] This might need to be performed by an entity other than the entity otherwise performing the claim. Hence, claim 2 provides a possible divided infringement situation.

In comparison, claim 3 adds this limitation, "the one or more voicemail identifiers also displayable with the at least partial text transcriptions via the visual voicemail

[138] *See* INVT SPE LLC v. ITC, 46 F.4th 1361, 1375 (Fed. Cir. 2022) (citations omitted).

[139] However, to the extent that the software responsible for receiving and processing is provided, and perhaps even controlled, by those controlling the voicemail server, this might not be divided infringement, depending on the facts.

inbox as one or more visual voicemail indicators." Claim 4 adds to the limitation of claim 3 "for a particular voicemail message, the one or more displayable visual voicemail indicators include at least one of the following: a time of a telephone call associated with the particular voicemail message; a date of the telephone call associated with the particular voicemail message; and/or a telephone number for the telephone call associated with the particular voicemail message." Claim 5 has the limitation "the telephone numbers displayable via the visual voicemail inbox as one of the one or more visual voicemail indicators in a manner so that the telephone numbers are selectable to call at least one of the telephone numbers." Claim 6 adds "displayable via the visual voicemail inbox as one or more visual voicemail indicators for respective voicemail messages along with the at least partial text transcription of the respective voicemail messages via the visual voicemail inbox of the voicemail system integrated as part of the mobile device." Claim 7 adds "wherein the text transcriptions respectively comprise an at least partial text transcription displayable in a manner so that a displayable telephone number in at least one of the at least partial text transcriptions is selectable to call the telephone number that is displayed." Claims 3–7, as in claim 1, merely add limitations rather than elements. Hence, no divided infringement occurs.

As another example, Example 5 includes an optical display and a non-transitory storage medium. The general idea is that the optical display produces light from either alternating rows or alternating columns in which either adjacent rows or columns are substantially orthogonally polarized. Executable instructions produce spatially interleaved light from these rows or columns. As a result, "intended image content" cannot be seen by a user who is not using eyewear or a visual screen designed to filter the interleaved light to remove obscuring image content. That

is, either adjacent rows or adjacent columns transmit intended image content *and* obscuring image content. However, a visual screen is able to filter the "obscuring image content." Thus, to infringe the claim of Example 5 below, an optical display must be present in the accused device.

Example 6 shows that by using a claim limitation rather than a claim element, a broader claim can be crafted. Here, the claim element, "an optical display, a micropolarizer comprising even numbered rows and/or columns with substantially vertical transmission axes and odd numbered rows and/or columns with substantially horizontal transmission axes respectively with a first quarter waveplate with a slow axis oriented at substantially +45° to be viewed through a visual screen comprising a second quarter waveplate with a slow axis oriented at substantially -45 and a polarizer with either a substantially vertical polarization axis or a substantially horizontal polarization axis," has been replaced with the claim limitation. The limitation reads:

> [W]herein polarized light providing the obscuring image content is to be produced from either every other row of the optical display or every other column of the optical and wherein light providing the intended image content substantially orthogonally polarized with respect to the polarized light is to be produced from either remaining rows of the optical display or remaining columns of the optical display.

EXAMPLE 5

I claim:

1. An apparatus comprising:

an optical display, a micropolarizer comprising even numbered rows and/or columns with substantially

vertical transmission axes and odd numbered rows and/or columns with substantially horizontal transmission axes respectively with a first quarter waveplate with a slow axis oriented at substantially +45° to be viewed through a visual screen comprising a second quarter waveplate with a slow axis oriented at substantially -45 and a polarizer with either a substantially vertical polarization axis or a substantially horizontal polarization axis; and

a non-transitory storage medium including stored thereon executable instructions capable of execution by a processor; wherein the instructions are executable to interleave, from either adjacent rows or adjacent columns, light providing obscuring image content via the optical display and light providing intended image content via the optical display from either adjacent rows or adjacent columns, wherein the light is to be interleaved in a spatial manner based at least in part on polarization state such that viewing the interleaved light through a visual screen is to compensate for the manner in which the light is to be interleaved so as to substantially reveal the intended image content and substantially block the obscuring image content.

EXAMPLE 6

I claim:

1. An article comprising: a non-transitory storage medium including stored thereon executable instructions capable of execution by a processor; wherein the instructions are executable to perform the following method:

interleaving light providing obscuring image content via an optical display and light providing intended image content via the optical display, wherein the light

> is to be interleaved in a spatial manner based at least in part on polarization state such that viewing the interleaved light through a visual screen is to compensate for the manner in which the light is to be interleaved so as to substantially reveal the intended image content and substantially block the obscuring image content, wherein polarized light providing the obscuring image content is to be produced, respectively, from either every other row of the optical display or every other column of the optical and wherein light providing the intended image content substantially orthogonally polarized with respect to the polarized light is to be produced, respectively, from either remaining rows of the optical display or remaining columns of the optical display.

Thus, in Example 5, because it is a claim element, the optical display must be present for direct patent infringement to occur. However, in Example 6, the claim element is the non-transitory storage medium. The executable instructions on the non-transitory storage medium are to perform light interleaving via the optical display. The instructions are capable of execution; hence, the optical display is not required to be present for direct infringement.

CONCLUSION

Although the Federal Circuit, in most cases, professes to treat claim elements and claim limitations the same, it does employ a jurisprudence regarding the so-called "environment of the invention."[140] This language and

[140] *See supra*, Sections 1, 2.

this approach are vague, both for claim construction and claim drafting. Instead, an analytic framework is provided in its place between claim elements and claim limitations. This analytical approach both assists with understanding the scope of a patent claim and with patent claim drafting to essentially, via appropriate language, control the scope of the drafted claim. It is also an analytical tool for spotting potential divided patent infringement situations and, in connection with patent claim drafting, provides an approach to replace language for claim elements with language for claim limitations to reduce the risk of divided patent infringement.[141]

[141] *See supra*, Sections 3, 4.