

Thought Leadership

Allocating Additional Profits between the Patentee and the Infringer Using the Footprint Methodology

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Federal Circuit case law requires that a proper reasonable royalty award isolate the value of the patented invention from any nonpatented features. However, the court has provided little judicial guidance on the important question of how to allocate that value between the patentee and the infringer. The authors propose a solution using the application of a unified damages methodology, called the “footprint” method. This method answers two questions to provide a framework for determining the proper allocation of value between patentee and infringer. First, “How much would the infringer have been willing to pay in exchange for the additional value it enjoyed from using the invention?” And, second, “How much would the patentee have been willing to accept based on the effect the infringer’s practice of the invention had on the patentee’s business?”

INTRODUCTION

If nothing else, current Federal Circuit case law is clear on one thing: in calculating a reasonable royalty owed for a defendant’s infringing acts, some effort should be taken to identify the value of the patented invention separate from the value of the nonpatented features. That said, judicial guidance is conspicuously absent on one important question: After identifying profits attributable to the claimed invention, how should those profits be allocated between the patentee and the infringer?

The court has said only what *not* to do. Do *not* use the “25 percent rule.”¹ Also, do *not* apply the Nash Bargaining Solution unless you can establish that the facts of the case satisfy the theory’s underlying assumptions.²

This lack of judicial guidance hampers efficient litigation. Parties may litigate a case through trial merely to challenge an opposing expert’s methodology on this open question with the hope of a home-run result. Patentees may choose not to invest in a meritorious enforcement effort because of the risk

at the trial court and on appeal. And trial courts are left with the burden to determine what constitutes an acceptable methodology for allocating additional profits proven to have resulted from the invention.

Recently, in the headline-grabbing case *Smartflash v. Apple*, the trial court sua sponte found error in its own damages jury instructions shortly after trial, vacating a \$533 million jury award.³

We propose a solution, referred to as the “footprint” method, named after the Federal Circuit’s explanation in *ResQNet.com v. Lansa*⁴ that “the trial court must carefully tie proof of damages to the claimed invention’s footprint in the market place.”

The “footprint” method relies on rigorous economic and evidentiary principles. It provides a defensible path to satisfy the requirements for a reasonable royalty award. The footprint method can accommodate varied factual scenarios including those unique to standard-essential patents. It also extends to lost profits and harmonizes the analyses for lost profits and reasonable royalty damages.



THE FOOTPRINT METHODOLOGY

Patent infringement remedies depend on the economic impact caused by the invention to either (1) the patentee or (2) the infringer. The footprint method begins with an economic principle and then incorporates a practical causation analysis to achieve a consistent method for all types of infringement remedies.

The footprint method originated as a repeatable and reproducible method for determining an appropriate range for reasonable royalty damages. The footprint method rests on three practical procedures:

1. Alternatives – Identifying alternatives to the claimed invention
2. Technical quantification – Quantifying the additional technical benefits achieved by the invention compared to the alternatives
3. Economic quantification – Translating the invention’s additional technical benefits to resulting additional profit versus using a noninfringing alternative

The results of these procedures can inform the analysis not only for reasonable royalty damages, but also lost profits damages and injunctive relief. In other discussions, we have focused the “footprint” damages methodology primarily on establishing the amount of additional profit attributable to the invention.⁵

In this discussion, we describe the three basic procedures of that analysis and then turn to a fourth procedure component: a method, based on case-specific evidence, for allocating that additional profit between the patentee and the infringer to determine a reasonable royalty. As such, in this discussion, we

use the footprint method to propose a solution to the Federal Circuit’s as-yet unanswered riddle.

To be clear, we use the term “allocation” differently than the courts use “apportionment.” “Apportionment” generally refers to the obligation to attribute damages only to patented features, excluding nonpatented features from the damages model. Our “footprint” analysis, as described in other discussions, incorporates the apportionment obligation.⁶

In this discussion, we use the term “allocation” to describe the process after apportionment of dividing the resulting value between the patentee and the infringer in a hypothetical negotiation.

In short, litigants and courts can properly allocate additional profits by answering two questions. First, “How much would the infringer have been willing to pay in exchange for the additional profit it enjoyed?” Second, “How much would the patentee have been willing to accept based on the effect the infringer’s practice of the invention would have on the patentee’s business?”

The answers to these questions provide the framework for determining the proper allocation of additional profit between patentee and infringer.

The method discussed below certainly requires investment of time and resources. The “shortcut” methods previously taken in patent litigation, however, have now been rejected by the Federal Circuit.

Therefore, we propose a rigorous solution compliant with that Federal Circuit law and supported by fundamental principles of causation and evidence.

ESTABLISHING AND ALLOCATING ADDITIONAL PROFIT USING THE FOOTPRINT METHODOLOGY

The footprint method determines additional profit attributable to the invention using the formula:

$$\Delta P_{INF} = (R_{INV} - R_{ALT}) + (C_{ALT} - C_{INV})$$

The variables in the equation are as follows:

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|------------------|--|
| ΔP_{INF} | The infringer’s additional profit attributable to the invention over alternatives |
| R_{INV} | The revenue obtained by the infringer by using the invention instead of a noninfringing alternative |
| R_{ALT} | The revenue the infringer would have obtained using a noninfringing alternative instead of the invention |

C_{ALT}	The costs the infringer would have incurred using a noninfringing alternative instead of the invention
C_{INV}	The costs the infringer incurred while using the invention instead of a noninfringing alternative

The next three sections describe the procedures in the analysis to reach the equation above. And, the subsequent sections describe how to allocate ΔP_{INF} between patentee and infringer consistent with Federal Circuit precedent.

Step One: Identifying Alternatives to the Claimed Invention

The first procedure is to define possible “alternatives” to practicing the claimed invention. The basic question for identifying alternatives is: **What could the infringer have done instead of practicing the claimed invention?**

An “alternative” is any feature that falls outside the scope of the patent claim or is authorized to practice the patent claim. Alternatives may come from the prior art, from later developed noninfringing features, from hypothetical noninfringing features that could have been developed, or from business alternatives such as discontinuing the infringing product.

Step Two: Quantifying the Additional Technical Benefits Achieved by the Invention as Used by the Infringer

The second procedure is to determine the technical benefits achieved by using the invention instead of an alternative. Ask: **What difference does the invention make compared to the alternative?**

If the invention relates to a manufacturing process, then the technical benefits may be the difference in yield achieved by the patented process over the alternative. If the invention relates to a component, like a computer chip, then the technical benefits may be the difference in speed or power consumption achieved by the patented component compared to an alternative design.

If the invention is a component used within a multifeature consumer product, then the technical benefit might be the impact on consumer-facing features like screen resolution or battery life compared to an alternative.

The goal of this procedure is to determine the ability to produce a numerical value isolating and quantifying the technical benefit of the invention.

Step Three: Translating the Invention’s Additional Technical Benefits to the Infringer’s Additional Profit

The third procedure is to translate the technical benefits to the economic benefit attributable to the invention. Ask: **How much additional money did the patentee or infringer make during the infringement versus the amount that would have been achieved using absent infringement?**

This procedure can be expressed using basic accounting principles. Profit (P) equals revenue (R) minus costs (C):

$$P = R - C$$

The footprint methodology introduces causation into this equation by evaluating the equation under two scenarios informed by the alternatives analysis described above:

1. *Actual*: what occurred during the period of infringement
2. *Hypothetical*: what would have occurred if the infringer had used a noninfringing alternative instead of the invention

For the actual scenario, we use the designation “INV” (standing for “with the invention”). For the hypothetical scenario, we use the designation “ALT” (standing for “with an alternative”). The profit achieved in the actual scenario in which the infringer used the invention is:

$$P_{INV} = R_{INV} - C_{INV}$$

The profit achieved in the hypothetical scenario in which the infringer would have used a noninfringing alternative is:

$$P_{ALT} = R_{ALT} - C_{ALT}$$

To incorporate causation, the footprint methodology evaluates the difference (ΔP) between:

1. the profit achieved during the infringer’s use of the invention (P_{INV}) and
2. the profit that could have been achieved had the infringer used a noninfringing alternative instead (P_{ALT}).

By taking the difference between these profit scenarios, the footprint approach apportions out all value from nonpatented features and isolates the difference in profit (ΔP) caused by the infringer’s use of the invention.

$$\Delta_P = P_{INV} - P_{ALT}$$

Substituting in the equations for P_{INV} and P_{ALT} and rearranging the variables, the result is the basic footprint equation, synthesizing tort causation and economic quantification:

$$\Delta_P = (R_{INV} - R_{ALT}) + (C_{ALT} - C_{INV})$$

The equation can be applied from either the patentee's perspective (evaluating the patentee's revenue and costs) or the infringer's. That is, the revenue and cost variables can represent either:

1. the patentee's difference revenues and costs in the actual (with infringement) and hypothetical (without infringement) scenarios, ΔP_{PAT} or
2. the infringer's revenues and costs in the actual and hypothetical scenarios, ΔP_{INF} .

In a reasonable royalty analysis, the likely most critical value is ΔP_{INF} , the additional profit achieved by the infringer from using the invention.

The hypothetical negotiation postulates that the infringer would have voluntarily paid some royalty in exchange for the opportunity to enjoy that profit. The question is, "how much?"

Step Four: Allocating Additional Profit between Patentee and Infringer

The allocation question is: "What happens after ΔP_{INF} is determined?" How much of the additional profit goes to the patentee, and how much to the infringer?

ΔP_{INF} in full likely does not represent the value of a reasonable royalty. This is because an economically rational licensee would not pay, as a royalty, the full amount of economic benefit it expected to achieve. The additional profit ΔP_{INF} should be allocated in some way to reach the appropriate reasonable royalty.

The allocation analysis is framed by two questions. First, what would the infringer have been willing to pay to enjoy the additional profit ΔP_{INF} it achieved by using the invention? Second, what would the patentee have been willing to accept in exchange for a license?

EVALUATING A BASELINE ROYALTY BASED ON THE INFRINGER'S EXPECTATIONS

A baseline for allocating additional profit ΔP_{INF} can be established by recognizing that the license

royalty represents an investment for the infringer. The royalty is an investment of capital made with the expectation of a predicted return.

Determining damages for *past* conduct allows the benefit of knowing how much money the infringer actually made, ΔP_{INF} , by using the invention instead of an alternative.

If the patentee can introduce evidence of the infringer's expected return on similar investments (a concept explored in further detail below), then the patentee can use that expected return to perform a discounted cash flow analysis on ΔP_{INF} that results in a baseline allocation of ΔP_{INF} between patentee and infringer.

Here's an example of how this objective may be accomplished.

First, we define two additional variables:

1. ROI_{INF} is the infringer's typical expected percentage return on investment, expressed as the total money returned. That is, if the infringer expects to make \$1.50 on a \$1.00 investment, this variable is expressed as 150 percent (not as 50 percent).
2. $Baseline_{INF}$ is the amount the infringer would have been willing to invest at the date of hypothetical negotiation in order to generate the additional profit, ΔP_{INF} , it enjoyed from the use of the invention.

With these variables, ΔP_{INF} can be defined in terms of the resulting return on the infringer's "investment" in a reasonable royalty fee negotiated at the time it began infringing. That is, additional profit is the reasonable royalty investment multiplied by the preferred return on investment.

As a result, we can calculate the baseline amount the infringer would have been willing to pay by dividing additional profit by ROI:

$$Baseline_{INF} = \Delta P_{INF} \div ROI_{INF}$$

The baseline amount that the infringer may have been willing to pay is represented by the additional profit divided by the infringer's expected return on investment. This is a simplified version of the analysis an economist may actually perform, which could also incorporate a temporal component such as the varying cash flow provided by the invention over time.

This analysis can be performed on the basis of additional profit for each infringing product or process, the total additional profit from all infringing products or processes, or something in between. If performed on a per-product basis, the analysis could result in an appropriate base percentage rate or per-

unit royalty to then be applied to each sale of an infringing product made by the infringer.

If performed on the total additional profits achieved by the infringer, it could result in a baseline lump-sum value, which could itself be converted into an appropriate running rate. The form of the royalty depends on other evidence introduced by the parties, including the form of royalties the parties have agreed to in prior licenses.

Evidence of an infringer's expected return on investment (ROI_{INF}) in a patent licensing transaction might come from prior IP transactions, other technology transactions, or the infringer's investment policies and business decisions in general.

When the profit allocation methodology is expressed as a typical evaluation of return on investment, the relevant evidence pool available to establish that concept expands.

Using this method, patentees and accused infringers will not be restricted in their damages proof to prior licenses for which "comparability" often is decided on a seemingly arbitrary basis.

EVALUATING A BASELINE ROYALTY BASED ON THE PATENTEE'S EXPECTATIONS

It may also be possible to establish a baseline royalty by evaluating how much the patentee would have been willing to accept in exchange for granting a license to the infringer. The "investment" the patentee makes in exchange for a return (the royalty) may contain two components.

First, the patentee invests by encumbering its patent portfolio with a license to the infringer, which can have several effects including the loss of the patentee's right to exclude, exhaustion of the ability to generate royalties from the infringer's downstream customers, and potentially diminished value of the licensed patents and the portfolio as a whole as a result of the encumbrance.

Second, the patentee invests by accepting any actual economic harm that may result from the licensee's practice of the invention, especially where such harm (for example, related but not "convoyed" sales) is not compensable under a lost profits theory.

By this description alone, it is apparent that quantifying the patentee's "investment" in the transaction, using admissible evidence, likely will be more difficult than quantifying the additional profit made by the infringer.



In many cases, calculating a baseline royalty by focusing on the infringer's return on investment may provide the most straightforward and executable approach.

Neither party should ignore the patentee's investment and expected return, however. If the patentee has economic evidence of how it has measured the value of its patent portfolio—and the impact on that value of prior patent licenses or sales—it may be able to show that it would expect a higher baseline rate in exchange for the investment it makes in terms of diminished value resulting from the license to the infringer.

In the "hypothetical negotiation" of patent infringement litigation, in which the infringer has in effect forced the patentee to offer a license, the court might give more weight to a quantified value the patentee is willing to accept than the quantified value the infringer would have been willing to pay. This principle could mitigate the risk that reasonable royalty damages may in effect impose a compulsory license.

Here, we offer an illustrative methodology for calculating a baseline royalty from the patentee's investment in the license transaction.

First, we express the patentee's investment as ΔP_{PAT} , the resulting difference in the patentee's economic position if it did not grant a license to the infringer. This profit comprises two components as discussed above.

First, ΔP_{DIM} , the diminished value of the patentee's IP rights as a result of the license. Second, ΔP_{HARM} , the economic harm suffered by the patentee as a result of the infringer's practice of the invention (for example, if the patentee lost sales of nonpatented products because the licensee had the right to practice the invention in competition).

The equation for the patentee's investment is:

$$\Delta P_{\text{PAT}} = \Delta P_{\text{DIM}} + \Delta P_{\text{HARM}}$$

Having defined ΔP_{PAT} —the amount of money the patentee *lost* because of the infringement—the same ROI approach discussed above can be used to determine how much money the patentee would expect to receive in exchange for a license.

From the patentee's perspective, its lost money ΔP_{PAT} is the investment, and the royalty is the amount of money it receives in exchange for that investment.

Two other variables round out the analysis:

1. ROI_{PAT} is the patentee's typical expected percentage return on investment.
2. $\text{Baseline}_{\text{PAT}}$ is the amount the patentee would have been willing to accept at the date of hypothetical negotiation in order to enjoy its preferred return on its investment.

The patentee's baseline royalty ($\text{Baseline}_{\text{PAT}}$) can then be expressed as its investment (ΔP_{PAT}) multiplied by its expected return (ROI_{PAT}):

$$\text{Baseline}_{\text{PAT}} = \Delta P_{\text{PAT}} \times \text{ROI}_{\text{PAT}}$$

Calculating both $\text{Baseline}_{\text{PAT}}$ and $\text{Baseline}_{\text{INF}}$ can indicate a definable range of results for a license agreement in a hypothetical negotiation. They provide quantified values, based on case-specific evidence, for the proper allocation of additional profit achieved by the infringer from using the invention.

In particular, if $\text{Baseline}_{\text{INF}}$ exceeds $\text{Baseline}_{\text{PAT}}$ (that is, the infringer would have been willing to pay an amount greater than the patentee would have been willing to accept), then there exists a range within which the parties would have been willing to agree on a hypothetical royalty rate.

If $\text{Baseline}_{\text{PAT}}$ exceeds $\text{Baseline}_{\text{INF}}$, then there is uncertainty about the rate at which the parties could have agreed in a hypothetical negotiation, but the methodology still has produced alternatives to present to the factfinder to weigh the evidence about bargaining power and determine the most likely result.

Either way, the methodology has produced values supported by the evidence specific to the case, establishing potential allocation of additional profits tailored to the facts and not based on shortcuts.

In this discussion, we do not attempt to explore all the ways that the proposed method may be modified and applied based on the facts and evidence available in each case. Creative parties and

economists will develop other methods for calculating both the infringer's and the patentee's baseline royalties.

Here, we introduce this extension of the footprint methodology as a means for litigants and courts to establish, using admissible evidence, a proper baseline allocation of additional profits attributable to the invention between the patentee and the infringer.

ACCEPTABILITY OF THE FOOTPRINT METHOD COMPARED TO REJECTED METHODS

The roots of the footprint method are causation and economics. The method combines theoretical economic principles with the actual facts of the case as established by the evidence.

The Federal Circuit's commentary on the "25 percent rule" and on the "Nash Bargaining Solution" methods to allocating additional profit illuminate how the approach outlined above improves upon these prior methods, resulting in an admissible methodology.

The "25 percent rule of thumb" arose from *empirical* licensing research, concluding that royalty rates typically amounted to 25 percent of the profit on a patented device.⁷

Patentees would apply the "rule" to establish a baseline royalty rate as 25 percent of the infringer's profit on the infringing device and adjust that baseline according to the *Georgia-Pacific*⁸ factors.

In the *Uniloc* case, the Federal Circuit held "as a matter of Federal Circuit law that the 25 percent rule of thumb is a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation."⁹

The "Nash Bargaining Solution" derives from the *theoretical* work of mathematician John Nash. It proposes that, under certain circumstances in a negotiation, the parties will negotiate to a "solution" in which both parties receive the same profit.¹⁰ The Nash Solution arose from theoretical work, not empirical research.

In the *VirnetX* case, the Federal Circuit vacated a reasonable royalty award in which incremental profits had been allocated between patentee and infringer by applying the Nash Solution.¹¹

The court found that the patentee had not "sufficiently establish[ed] that the premises of the theorem actually apply to the facts of the case at hand."¹²

Underlying the rejection of both the 25 percent rule and the Nash Bargaining Solution is the requirement of evidence “tied to the particular facts” of the case.¹³

An empirical conclusion, like the 25 percent rule, almost by definition cannot be analogized to the facts of any particular case because it is based on different economic transactions (licenses negotiated under different facts).

A theoretical method could be applied, but the party applying the theory should carry its burden of establishing—with case-specific evidence—that the theory’s underlying assumptions are indeed true for that particular case.

The footprint method for calculating additional profit and then allocating it between patentee and infringer applies a theoretical method augmented by evidence to tailor the approach to the facts of each case. The patentee’s or the infringer’s expected return on investment should be established with evidence.

Because the footprint equation does not produce any results without causation evidence and quantification evidence establishing the variables, it is necessarily bound to the facts of each case. The Federal Circuit’s critiques of the 25 percent rule and the Nash Bargaining Solution should not apply to the footprint method.

CONCLUSION

The market for patent rights demands a solution to the problem of allocating, between patentee and infringer, profit attributable to the invention and economic loss attributable to licensing the invention.

Currently the case law offers no solution. By extending the footprint method to calculate baseline royalties based on expected return on investment, the parties can provide a defensible allocation method rooted in causation, quantification, and evidence.

Notes:

1. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315 (Fed. Cir. 2011).
2. VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1325 (Fed. Cir. 2014); Good Tech. Corp. v. MobileIron, Inc., No. 5:12-cv-05826-PSG, Dkt. 436 (N.D. Cal. July 5, 2015); Content Guard Holdings, Inc. v. Amazon.com, Inc., et al., No. 2:13-cv-1112-JRG, Dkt. No. 825 at 17-18 (E.D. Tex. Aug. 6, 2015) (denying motion to exclude damages opinion applying Rubenstein bargaining model where the plaintiff “articulate[d] each premise of the Rubenstein model and cites to specific evidence from [the expert’s] report

that supports the premise,” while also using “Defendant-specific evidence as inputs to some of the premises”); see also A. Fahrenkrog, L. Drew, & J. Harting et al., “A Guide to Understanding the Federal Circuit’s VirnetX Opinion,” *Law360* (October 14, 2014) (explaining the difference between eliminating the Nash Solution completely and requiring that it fit the facts of the case).

3. Smartflash LLC v. Apple Inc., No. 6:13-cv-447-JRG, Dkt. 581 (E.D. Tex. July 27, 2015).
4. ResQnet.com, Inc., v. Lansa, Inc., 594 F.3d 860, 872 (Fed. Cir. 2010).
5. A. Fahrenkrog, “A New ‘Footprint’ Paradigm for Reasonable Royalty Damages,” *Law360* (March 11, 2015); A. Fahrenkrog, C. Yun Sauer, and B. Linden, “SEPs Don’t Need a Different Reasonable Royalty Analysis,” *Law360* (March 24, 2015); A. Fahrenkrog, “Convergence: A Common Framework for Lost Profits and Reasonable Royalty Damages Using the Footprint Approach,” *Intellectual Property Today* (May 2015).
6. See id., in particular A. Fahrenkrog, “A New ‘Footprint’ Paradigm for Reasonable Royalty Damages,” *Law360* (March 11, 2015) and A. Fahrenkrog, C. Yun Sauer, and B. Linden, “SEPs Don’t Need a Different Reasonable Royalty Analysis,” *Law360* (March 24, 2015).
7. Uniloc, 632 F.3d at 1312-13.
8. *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970), *mod. and aff’d*, 446 F.2d 295 (2d Cir. 1971), *cert. denied*, 404 U.S. 870 (1971).
9. Uniloc, at 1315.
10. VirnetX, 767 F.3d at 1325.
11. Id. at 1331-34.
12. Id. at 1332.
13. Id. at 1333-34.

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