IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

UPF INNOVATIONS, LLC,	§	
	§	
Plaintiff,	§	
	§	**Civil Action No. 1:18-cv-620**
v.	§	
	§	**JURY TRIAL DEMANDED**
COHERENT LOGIX INC.,	§	
	§	
Defendant.	§	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff UPF Innovations, LLC ("UPF"), by and through its attorneys, brings this action and makes the following allegations of patent infringement relating to U.S. Patent No. RE40,188 ("the '188 Patent" or "the patent-in-suit").

PARTIES

1. UPF is a Texas Limited Liability Company with its principal place of business located at 3800 N. Lamar Blvd., Suite 200, Austin, TX 78756.

2. On information and belief, Coherent Logix Inc. ("Coherent Logix") is a Delaware corporation with its principal place of business at 1120 S. Capital of Texas Highway, Building 3, Suite 200, Austin, TX 78746. Coherent Logix can be served through its registered agent corporation, Michael Doerr, located at 1120 S. Capital of Texas Highway, Building 3, Suite 310, Austin, TX 78746.

3. On information and belief, Coherent Logix is headquartered and maintains a physical office in Austin, Texas.[1]

[1] COHERENT LOGIX WEBSITE, https://www.coherentlogix.com/contact-us/ (last visited July 3, 2018).

4. On information and belief, Coherent Logix conducts business, including research and development, marketing, and sales activities at its headquarters in Austin, Texas, which is located in the Western District of Texas.[2]

5. On information and belief, Coherent Logix offers infringing products for sale throughout the United States, including in the Western District of Texas.

JURISDICTION AND VENUE

6. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

7. Upon information and belief, this Court has personal jurisdiction over Coherent Logix in this action because Coherent Logix has committed acts within the Western District of Texas giving rise to this action and Coherent Logix has established minimum contacts with this forum such that the exercise of jurisdiction over Coherent Logix would not offend traditional notions of fair play and substantial justice. Coherent Logix, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the patent-in-suit. Moreover, Coherent Logix is registered to do business in the State of Texas, and has appointed Michael Doer, located at 1120 S. Capital of Texas Highway, Building 3, Suite 310, Austin, TX 78746, as its agent for service of process. [3]

8. Venue is proper in this district under 28 U.S.C. § 1400(b). On information and

[2] COHERENT LOGIX WEBSITE, https://www.coherentlogix.com/about-us/ (last visited July 3, 2018).

[3] TEXAS COMPTROLLER OF PUBLIC ACCOUNTS, TAXABLE ENTITY SEARCH, Texas Taxpayer Number 15938043385, Franchise Tax Details, As of: 07/02/2018, available at https://mycpa.cpa.state.tx.us/coa (last visited July 3, 2018).

belief, Coherent Logix has a physical presence in the Western District of Texas, is headquartered in the Western District of Texas, and has a regular and established place of business in this judicial district, at 1120 S. Capital of Texas Highway, Building 3, Suite 200, Austin, TX 78746.[4] Consistent with its physical presence and regular and established place of business, Coherent Logix advertises its presence in the Western District of Texas on its website.[5] Further, upon information and belief, Coherent Logix has transacted business in the Western District of Texas and has committed acts of direct infringement in the Western District of Texas.

TECHNOLOGY OVERVIEW

9. Integrated circuits have become ubiquitous and continue to become smaller, more powerful, and more complex. Modern integrated circuits, such as processors, systems on a chip ("SOCs" or "Socks"), digital memory, application-specific integrated circuits ("ASICs"), and field-programmable gate arrays ("FPGAs"), are used in virtually all modern electronic devices.

10. Integrated circuits are often manufactured in batch processes intended to make all integrated circuit chips identical, thereby lowering manufacturing costs and improving quality. However, it is useful to be able to distinguish each individual integrated circuit from all others, for example, to track its source of manufacture, or to identify a system employing the integrated circuit, which are both useful strategies for avoiding counterfeiting.

11. While it takes incredible ingenuity to design advanced integrated circuits, and the electronic devices that run by them, such circuitry is nevertheless susceptible to counterfeit.

12. In general, a counterfeit electronic part is any unlawful or unauthorized reproduction, substitution, or alteration that has been knowingly mismarked, misidentified, or

[4] *See* note 1, *supra* (Coherent Logix headquarters located at "1120 S. Capital of Texas Highway, Building 3, Suite 200, Austin, TX, 78746")
[5] *See* note 2, *supra*

otherwise misrepresented to be an authentic, unmodified electronic part from the original manufacturer or a source with the express written authority of the original manufacturer or current design activity, including an authorized aftermarket manufacturer. Unlawful or unauthorized substitution may include used electronic parts represented as new, or the false identification of grade, serial number, lot number, date code, or performance characteristics.[6]

13. Counterfeit electronic parts cost American companies billions of dollars each year.[7] But the danger of economic harm is not the only risk of counterfeit parts; rather, counterfeit parts also create significant health and safety risks due to their ubiquity in electronic devices of all sorts, including health and safety equipment.

14. As a result of the risks posed by counterfeit electronic parts, the U.S. government has enacted many laws to eliminate the introduction of counterfeit parts into the stream of commerce—especially where government contracts are concerned. For example, in 2012 the U.S. government enacted laws requiring regulations for contractors on detection and avoidance of the use of counterfeit electronic parts.[8]

15. Many technological solutions for preventing and detecting counterfeit parts have been developed, including, for example, integrating radio-frequency identification (RFID) tags into electronic parts, creating hardware "fingerprints," "watermarking" electronic parts, and others. Many of these technologies are referred to as "intrinsic security" measures because they

[6] *See*, *e.g.*, U.S. Defense Federal Acquisition Regulation 202.101; SAE Int'l AS5553A and AS6081A.
[7] *See*, *e.g.*, Matthew R. Shindell et al., The 'Ticking Time Bomb' of Counterfeit Electronic Parts, Industry Week (Jul. 22, 2013), http://www.industryweek.com/ procurement/ticking-time-bomb-counterfeit-electronic-parts.
[8] *See* Contractor Counterfeit Electronic Part Detection and Avoidance System, 48 CFR 252.246-7007 (May 2014), available at https://www.gpo.gov/fdsys/pkg/CFR-2014-title48-vol3/pdf/CFR-2014-title48-vol3-sec252-246-7007.pdf (last visited July 3, 2018).

are built into the electronic parts.

16. One intrinsic security technique is based on Physical Unclonable Functions (PUFs). PUFs allow an electronic part to be uniquely identified based on the unique properties of its microstructure, which depend on random physical factors introduced during manufacturing. PUFs are extremely useful for electronic devices because they are easy to produce, often requiring no special manufacturing steps, but very difficult if not impossible to duplicate, even if the exact manufacturing process that produced the PUF is known. PUFs are frequently implemented in electronic parts with high security requirements.

OVERVIEW OF U.S. PATENT NO. RE40,188

17. U.S. Patent Application No. 09/251,692 ('692 Application) was filed on February 17, 1999 and subsequently issued as U.S. Patent No. 6,161,213 ('213 Patent), entitled "System and Method for Providing Integrated Circuit with a Unique Identification," on December 12, 2000.

18. On December 12, 2002, the assignee of the '213 Patent filed U.S. Patent Reissue Application 10/318,583 ('583 Application), entitled "System and Method for Providing Integrated Circuit with a Unique Identification," based on the '213 Patent. The '583 Application was subsequently reissued as RE40,188 ('188 Patent) on March 25, 2008. The '188 Patent includes 164 claims total, of which 10 are independent claims. A true and correct copy of the '188 Patent is attached hereto as Exhibit 1.

19. The '188 Patent recognizes that, while many methods exist for uniquely identifying an electronic part, those existing methods require special steps during manufacturing that add cost and time to the manufacturing process. To solve this problem, the '188 Patent teaches a novel method for reliably and easily identifying and authenticating individual

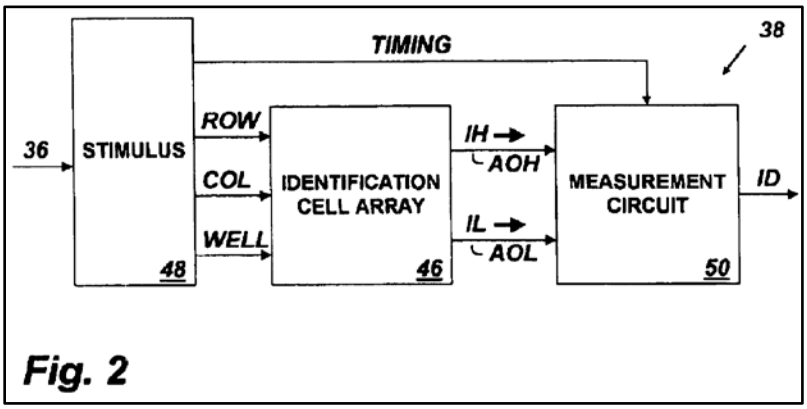
integrated circuits that does not require any additional manufacturing steps or equipment. Ex. 1 ['188 Patent] at 2:36-44.

20. In particular, the '188 Patent teaches a method of producing integrated circuit identification (ICID) circuits, which produces a unique identification number or record (ID) for each chip in which the ICID is included, even though the ICID circuit is fabricated on all chips using identical masks. Ex. 1 ['188 Patent] at 2:46-50.

21. Embodiments of ICID circuits include a set of cells that produce an output ID based on measurements of outputs of those cells, and the outputs of those cells are functions of random parametric variations that naturally occur when fabricating the ICID circuit. Ex. 1 ['188 Patent] at 2:50-54. Embodiments of ICID circuits include arrays of cells and a circuit for selecting each cell of the array, measuring that cell's output, and producing the chip ID based on the pattern of measured outputs of all cells in the array. Ex. 1 ['188 Patent] at 2:57-62. The chip ID is thus a unique "fingerprint" for the chip. Ex. 1 ['188 Patent] at 3:1-4.

22. The '188 Patent teaches that when the number of ICID circuit cells is sufficiently large, then millions of chips can be provided with a unique identifying ID without having to customize each chip using costly and time-consuming additional processing steps during or after chip fabrication. Ex. 1 ['188 Patent] at 2:54-56; 3:13-17.

23. Figure 2 of the ’188 Patent depicts a functional block diagram of an embodiment of an ICID device:



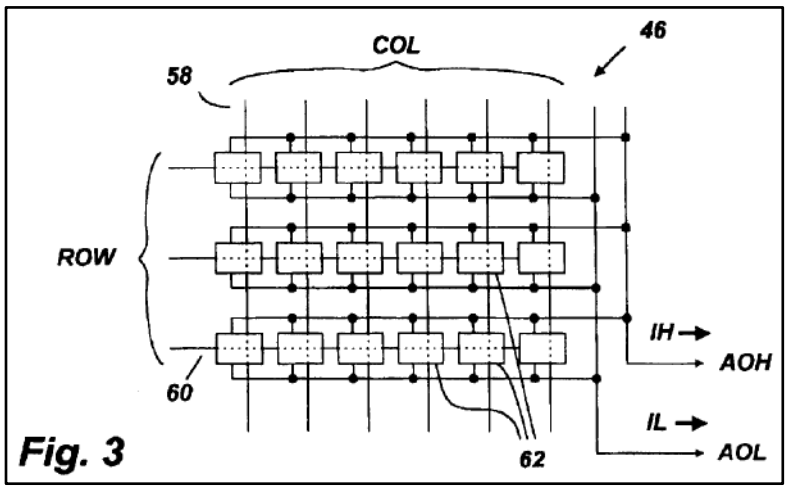
Ex. 1 [’188 Patent] at Fig. 2.

24. Referring to Figure 2, the specification explains: “ICID circuit **38** includes an array **46** of rows and columns of cells. Each cell of array **46**, when selected produces a pair of output currents IH and IL on array output lines AOH and AOL. The IH and IL currents are produced by similar transistors within the selected cell and are nearly equal. But due to differences in the transistors resulting from random parametric variations, the IH and IL currents will not exactly match. The difference between the IH and IL currents will vary from cell to cell. A stimulus circuit **48** responds to the control input **36** by supplying row select data (ROW) and a column select data (COL) to array **46** to individually select and stimulate each of its cells in turn. As it selects a cell, stimulus circuit **48** sends timing signals (TIMING) to a measurement circuit **50** telling it when to measure a difference between the currents IH and IL of the selected cell.” Ex. 1 [’188 Patent] at 5:22-37.

25. The specification further explains that: “[m]easurement circuit **50**, sequenced by TIMING strobes from stimulus circuit **48**, measures the current difference between IH and IL for each cell and … produces a serial output ID having a value that is base[d] on the particular

pattern of measured current differences for all cells of array **46**." Ex. 1 ['188 Patent] at 5:51-56.

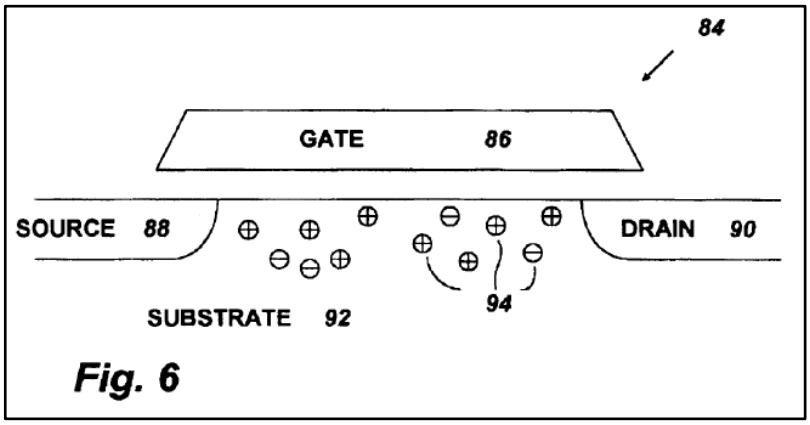
26. Figure 3 of the '188 Patent depicts more detail regarding an embodiment of an identification cell array:



Ex. 1 ['188 Patent] at Fig. 3.

27. Notably, Figure 3 is merely one example of a structure of such an array. As the specification teaches: "the number of cells 62 that should be included in array 46 is largely a function of the number of ICs to be uniquely identified." Ex. 1 ['188 Patent] at 12:13-20.

28. The cells themselves may be formed in some embodiments from transistors, such as shown in basic form with respect to Figure 6:



Ex. 1 ['188 Patent] At Fig. 6.

29. As further described in the specification: ICID **38** (Figure 2) "may be adapted to

provide an output ID that not only uniquely identifies an IC in which it is installed but also includes a 'type code' indicating aspects of the IC that is has in common with other ICs sharing the same photomask, such as its type, source of manufacture, etc. Thus, an output ID of ICID **38** would include one field having a value that is unique to the IC in which it is installed and another field having a value that is common to all similar ICs." Ex. 1 ['188 Patent] at 5:62-64.

30. Further, the specification explains that the output ID can be stored in a database and used to later identify the specific part. Ex. 1 ['188 Patent] at 14:55-15:8. Similarly, if a part is tested and found not to be in the database, then it may be determined to be a counterfeit. Ex. 1 ['188 Patent] at 15:12-13.

31. Additionally, an output ID "may be stored on the chip itself as a sequence of values in an on-chip Random Access Memory (RAM) which may be non-nonvolatile. The RAM may be part of a microprocessor on-board cache, and available to software executed by that microprocessor. This arrangement allows fast access to the ID during use …." Ex. 1 ['188 Patent] at 16:5-10.

32. The innovativeness of the solutions taught in the '188 Patent are clear from the industry's myriad references to it and its predecessor patent.[9] By way of example, the '213 Patent (predecessor to '188 Patent) has been cited in patent documents all over the world more

[9] *See*, *e.g.*, Erik Oliver et al., Finding the Best Patents – Forward Citation Analysis Still Wins, IPWatchdog (Mar. 24, 2016), http://www.ipwatchdog.com/2016/03/24/ finding-best-patents-forward-citation-analysis-still-wins/id=67192/ ("We've identified five primary factors for consideration in patent ranking (in order of weighting): Forward citations (45%) Age of patent from priority date (19%) Independent claim count (adjusted by number of means claims) (14%) Claim 1 word count (12%) Family size and international filings (10%) **We were surprised to discover that forward citations dominate the analysis. We evaluated millions of patents – and consistently forward citations were the biggest predictor of a higher value patent**.") (emphasis added).

than 260 times by the likes of Advanced Micro Devices,[10] Analog Devices Inc.,[11] Fujitsu,[12] Hewlett Packard,[13] Hitachi,[14] IBM,[15] Intel,[16] Intrinsic ID,[17] MIT,[18] National Semiconductor,[19] Nokia,[20] Panasonic,[21] Philips,[22] Samsung,[23] STMicroelectronics,[24] Synaptics,[25] Texas Instruments,[26] and Verayo.[27] And despite the '188 Patent issuing more than eight years after the '213 Patent, and almost a decade after the original filing date, it continues to be cited in contemporary patents and patent applications.[28]

33. UPF is the owner and assignee of the patent-in-suit as recorded by the USPTO at Reel/Frame: 042956/0213.

COUNT I
DIRECT INFRINGEMENT OF U.S. PATENT NO. RE40,188
(AGAINST COHERENT LOGIX, INC.)

34. UPF restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

35. UPF is the owner by assignment of the '188 Patent.

---

[10] *See*, *e.g.*, U.S. Pat. No. 6,968,303.
[11] *See*, *e.g.*, U.S. Pat. No. 6,480,136.
[12] *See*, *e.g.*, U.S. Pat. Nos. 6,862,725; 7,062,346.
[13] *See*, *e.g.*, U.S. Pat. Nos. 6,960,753; 6,889,305.
[14] *See*, *e.g.*, U.S. Pat. Nos. 6,941,536; 7,665,049.
[15] *See*, *e.g.*, U.S. Pat. Nos. 8,214,169; 8,619,979.
[16] *See*, *e.g.*, U.S. Pat. Nos. 7,813,507; 7,102,358.
[17] *See*, *e.g.*, U.S. Pat. No. 7,840,803.
[18] *See*, *e.g.*, U.S. Pat. Nos. 7,681,103; 7,757,083.
[19] *See*, *e.g.*, U.S. Pat. Nos. 7,602,666; 7,482,657.
[20] *See*, *e.g.*, U.S. Pat. No. 7,356,627.
[21] *See*, *e.g.*, U.S. Pat. Nos. 7,655,483; 8,510,608.
[22] *See*, *e.g.*, WIPO Pub. Nos. WO/2004/017408, WO/2004/105125.
[23] *See*, *e.g.*, U.S. Pat. No. 6,600,686.
[24] *See*, *e.g.*, U.S. Pat. Nos. 8,745,107; 7,334,131.
[25] *See*, *e.g.*, U.S. Pat. Nos. 8,698,594; 9,697,411.
[26] *See*, *e.g.*, U.S. Pat. No. 6,952,623.
[27] *See*, *e.g.*, U.S. Pat. Nos. 8,782,396; 8,683,210.
[28] *See*, *e.g.*, U.S. Pat. Nos. 9,506,983; 9,568,540.

36. On information and belief, Coherent Logix makes, uses, sells, offers to sell, and/or imports HyperX Memory Network Processors (the "Coherent Logix Accused Products").

37. On information and belief, to the extent the preamble of claim 21 of the '188 Patent is limiting, the Coherent Logix Accused Products comprise an apparatus in an integrated circuit (IC) for generating an identification number (ID) identifying the IC. For example, the Coherent Logix Accused Products contain design security systems to protect against tampering, cloning, overbuilding, reverse engineering, and counterfeiting, as well as providing traceability through the entire lifetime of the system. Among these design security features are physically unclonable functions ("PUFs"). On information and belief, the "PUF" technology incorporated into the Coherent Logix Accused Products make use of SRAM cells ("an apparatus in an integrated circuit (IC)") that generate startup values of SRAM memory, these values forming a unique device fingerprint called the SRAM PUF response ("generating an identification number identifying the IC").

38. On information and belief, the Coherent Logix Accused Products comprise an identification circuit formed within the IC, the identification circuit outputting signals that are a substantial function of random parametric variations in the IC. On information and belief, the Coherent Logix Accused Products have transistors in SRAM cells that have random electric properties due to sub-micro process variations in the manufacturing process ("an identification circuit formed within the IC . . . random parametric variations in the IC"). On information and belief, these random electric properties are expressed in the startup values of uninitialized SRAM memory or blocks into a unique pattern of 0's and 1's, forming a unique fingerprint called the SRAM PUF response ("the identification circuit outputting signals that are a substantial function of random parametric variations in the IC").

39. On information and belief, the Coherent Logix Accused Products comprise a measurement circuit, the measurement circuit receiving the signals that are a substantial function of random parametric variations in the IC, wherein the measurement circuit generates the ID, wherein the ID is a substantial function of the random parametric variations. For example, on information and belief the Coherent Logix Accused Products turn the electronic fingerprint or footprint into a strong secret cryptographic key ("receiving the signals that are a substantial function of random parametric variations in the IC, wherein the measurement circuit generates the ID, wherein the ID is a substantial function of the random parametric variations"). On information and belief, these secret cryptographic keys are not stored on the chip but are extracted from the chip only when needed. On information and belief, these secret cryptographic keys can be used as a root key to wrap or manage user keys.

40. By making, using, testing, offering for sale, selling, and/or importing integrated circuits, including but not limited to the Coherent Logix Accused Products, Coherent Logix has injured and continues to injure UPF and is liable to UPF for directly infringing one or more claims of the '188 Patent, including at least Claim 21, pursuant to 35 U.S.C. § 271(a).

41. As a result of Coherent Logix's infringement of the '188 Patent, UPF has suffered and is suffering monetary damages, and seeks recovery in an amount adequate to compensate for Coherent Logix's infringement, but in no event less than a reasonable royalty for the use made of the invention by Coherent Logix together with interest and costs as fixed by the Court.

42. Additionally, at least since the filing and service of this Complaint, on information and belief, Coherent Logix has had knowledge of the '188 Patent and of its infringement, including by way of this lawsuit.

43. Upon information and belief, at least since the filing and service of this

Complaint, Coherent Logix's direct infringing activities have continued and are continuing with knowledge of the '188 Patent, and with knowledge of its infringement of the '188 Patent. These infringing activities are, at a minimum, done with reckless disregard and/or willful blindness of UPF's rights under the '188 Patent. Coherent Logix's continuing acts of infringement are therefore intentional, deliberate, and willful.

COUNT II
INDUCING INFRINGEMENT OF U.S. PATENT NO. RE40,188
(AGAINST COHERENT LOGIX, INC.)

44. UPF restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

45. On information and belief, at least as of the filing and service of this Complaint, Coherent Logix intends to induce patent infringement by third-party customers and users of the Coherent Logix Accused Products and has knowledge that the inducing acts will cause infringement or is willfully blind to the possibility that its inducing acts will cause infringement. Coherent Logix specifically intends and is aware that the normal and customary use of the Coherent Logix Accused Products infringes the '188 Patent. Coherent Logix performs the acts that constitute induced infringement, and will induce actual infringement, with knowledge of the '188 Patent and with knowledge that the induced acts will constitute infringement. For example, Coherent Logix provides the Coherent Logix Accused Products, which are capable of operating in a manner that infringes one or more claims of the '188 Patent, including at least claim 21, and Coherent Logix further provides documentation and training materials that cause customers of the Coherent Logix Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the '188 Patent. By providing instruction and training to customers on how to use the Coherent Logix Accused Products, Coherent Logix specifically

intends to induce infringement of the ’188 Patent, including at least claim 21. On information and belief, Coherent Logix engages in such inducement to promote the sales of the Coherent Logix Accused Products and to actively induce its customers to infringe the ’188 Patent. Accordingly, Coherent Logix is inducing users of the Coherent Logix Accused Products to use the accused products in their ordinary and customary way to infringe the ’188 Patent, knowing that such use constitutes infringement of the ’188 Patent.

46. As a result of Coherent Logix’s infringement of the ’188 Patent, UPF has suffered and is suffering monetary damages, and seeks recovery in an amount adequate to compensate for Coherent Logix’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Coherent Logix together with interest and costs as fixed by the Court.

47. Upon information and belief, at least since the filing and service of this Complaint, Coherent Logix’s activities inducing infringement have continued and are continuing with knowledge of the ’188 Patent, and with knowledge of its infringement of the ’188 Patent. These infringing activities are, at a minimum, done with reckless disregard and/or willful blindness of UPF’s rights under the ’188 Patent. Coherent Logix’s continuing acts of infringement are therefore intentional, deliberate, and willful.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff UPF respectfully requests that this Court enter:

1. A judgment in favor of Plaintiff UPF that Coherent Logix has directly infringed the ’188 Patent, either literally and/or under the doctrine of equivalents;
2. A judgment in favor of Plaintiff UPF that Coherent Logix has induced infringement of the ’188 Patent;
3. A judgment and order requiring Coherent Logix to pay UPF its damages, costs,

expenses, and pre-judgment and post-judgment interest for Coherent Logix's infringement of the '188 Patent as provided under 35 U.S.C. § 284, including supplemental damages for any continuing post-verdict or post-judgment infringement with an accounting as needed;

4. A finding of willful infringement by Coherent Logix and an award to UPF of enhanced damages pursuant to 35 U.S.C. § 284;
5. A judgment and order finding this case exceptional and requiring Coherent Logix to pay UPF its reasonable attorneys' fees and costs incurred in this litigation pursuant to 35 U.S.C. § 285, together with pre-judgment and post-judgment interest thereon; and
6. Any and all other relief to which UPF may show itself to be entitled.

JURY TRIAL DEMANDED

Pursuant to Federal Rule of Civil Procedure 38(b), UPF requests a trial by jury of all issues so triable by right.

[SIGNATURE PAGE FOLLOWS]

Dated: July 25, 2018

Debra Coleman
Texas State Bar No. 24059595
deb@coleman-coleman.com
COLEMAN & COLEMAN, P.C.
P.O. Box 161957
Austin, Texas 78716
Telephone: 512-327-8933

David C. Radulescu, Ph.D.
(pro hac vice application to be submitted)
david@radip.com
Daniel Kesack
(pro hac vice application to be submitted)
daniel@radip.com
RADULESCU LLP
350 Fifth Avenue, Suite 6910
New York, New York 10118
Telephone: 646-502-5950
Facsimile: 646-502-5959

Counsel for Plaintiff UPF Innovations, LLC