IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF FLORIDA
GAINESVILLE DIVISION

UPF Innovations, LLC, Plaintiff, v. The Athena Group, Inc., Defendant.	Case No.: 1:18-cv-00037-MW-GRJ JURY TRIAL DEMAND

AMENDED COMPLAINT FOR PATENT INFRINGEMENT[1]

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, Defendant The Athena Group is a Florida corporation with its principal place of business at 408 W. University Ave., STE 306, Gainesville, FL, 32601. Athena can be served through its registered agent, Lori G. Taylor, 3424 N.W. 31st Street, Gainesville, FL, 32605.

[1] This Amended Complaint is identical to the original Complaint, except that plaintiff inadvertently failed to attach a copy of the patent-in-suit to the original Complaint. Exhibit 1 is attached to this pleading.

3. On information and belief, Athena has a single office located in Gainesville, Florida.[2]

4. On information and belief, Athena conducts engineering, research and development, sales and administration activities at its office in Gainesville, Florida.[3]

5. On information and belief, Athena offers infringing products for sale throughout the United States, including in the Northern District of Florida.

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 Athena in this action because Athena has committed acts within the Northern District of Florida giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Athena would not offend traditional notions of fair play and substantial justice. Athena, 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,

[2] ATHENA WEBPAGE, available at http://www.athena-group.com/location/ (accessed February 13, 2018).
[3] ATHENA WEBPAGE, available at http://www.athena-group.com/ (accessed February 13, 2018).

among other things, offering to sell and selling products and/or services that infringe the patent-in-suit. Moreover, Athena is incorporated in Florida, and has its principle place of business in Gainesville, Florida[4]; is registered to do business in the State of Florida[5]; and has appointed Lori G. Taylor, 3424 N.W. 31st Street, Gainesville, FL, 32605, as its agent for service of process.

8. Venue is proper in this district under 28 U.S.C. § 1400(b). Athena resides in Florida because Florida is its state of incorporation. Further, Athena has a regular and established place of business in the Northern District of Florida, in Gainesville, Florida, at 408 W. University Ave., STE 306, Gainesville, Florida, 32601. Consistent with its physical presence in Gainesville, Florida, Athena advertises its presence in the Northern District of Florida on its website.[6] Further, upon information and belief, Athena has transacted business in the Northern District of Florida and has committed acts of direct infringement in the Northern District of Florida.

TECHNOLOGY OVERVIEW

9. Integrated circuits have become ubiquitous in today's world and

[4] *See* note 1, *supra*.
[5] *See* ATHENA ANNUAL REPORT, Filed Feb. 10, 2017, available at http://search.sunbiz.org/Inquiry/CorporationSearch/GetDocument?aggregateId=domp-j18876-10e051e7-232b-4b17-bb38-8a883a926b4b&transactionId=j18876-2110317b-6f89-4e76-b900-fc8ecd8390cc&formatType=PDF (last accessed February 8, 2018).
[6] *See* note 1, *supra* (Athena office located at "408 W. University Ave., #306, Gainesville, Florida, 32601")

continue to become smaller, more powerful, and more complex. Modern integrated circuits, such as processors, systems on a chip ("SoCs"), digital memory, application-specific integrated circuits ("ASICs"), and field-programmable gate arrays ("FPGAs"), are used in virtually all of today's 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 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.[7]

13. Counterfeit electronic parts cost American companies billions of dollars a year.[8] But economic risk is not the only risk of counterfeit parts; rather, counterfeit parts create significant health and safety risks as well 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 contractor responsibilities for detection and avoidance of the use of counterfeit electronic parts.[9]

15. Many technological solutions for preventing and detecting counterfeit parts have been developed, including, for example, integrating radio-frequency

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[7] *See*, *e.g.*, U.S. Defense Federal Acquisition Regulation 202.101; SAE Int'l AS5553A and AS6081A.

[8] *See*, *e.g.*, The 'Ticking Time Bomb' of Counterfeit Electronic Parts, available at http://www.industryweek.com/procurement/ticking-time-bomb-counterfeit-electronic-parts (last accessed February 13, 2018).

[9] See 48 CFR 252.246-7007 "Contractor Counterfeit Electronic Part Detection and Avoidance System" available at https://www.gpo.gov/fdsys/pkg/CFR-2014-title48-vol3/pdf/CFR-2014-title48-vol3-sec252-246-7007.pdf (last accessed February 13, 2018).

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 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 depends 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 the manufacturing process 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.

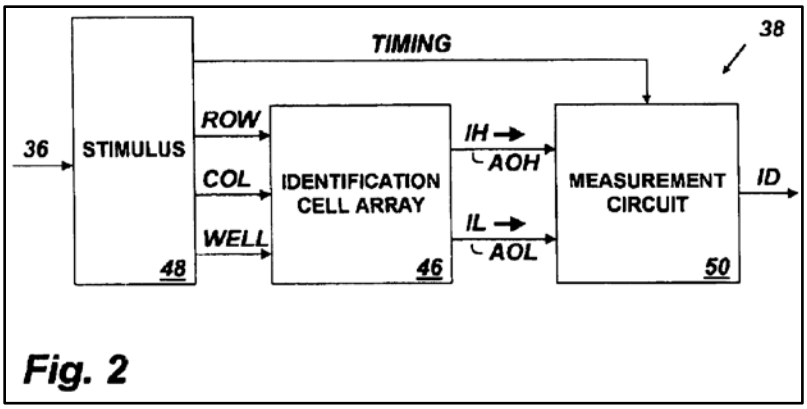
20. In particular, the ‘188 Patent teaches a method of producing integrated circuit identification (ICID) circuits, which produces a unique identification number or record (ID) for each chip in which the ICID is included, even though the ICID circuit is fabricated on all chips using identical masks. 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:



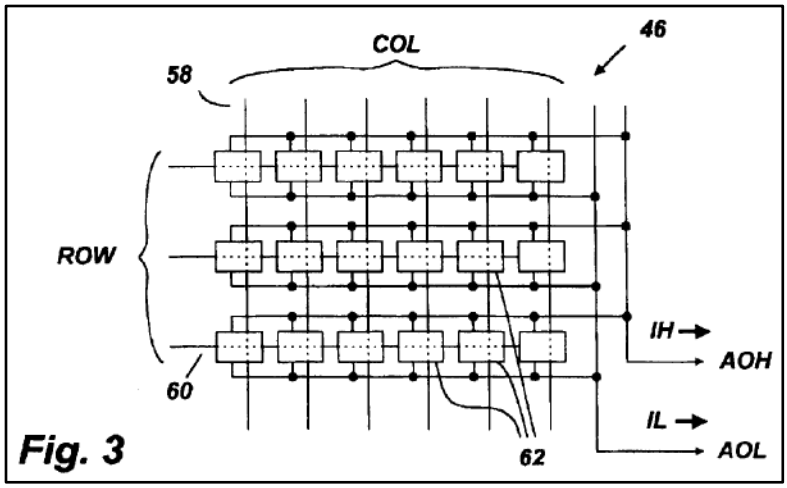
Ex. 1 ['188 Patent] at Fig. 2.

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.

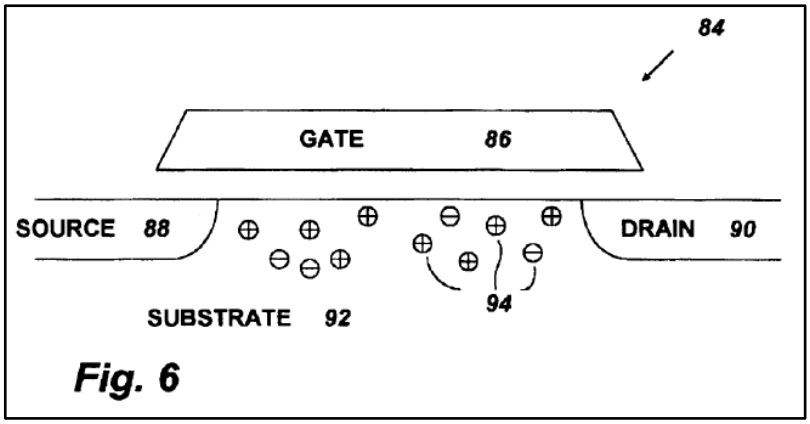
26. Figure 3 of the '188 Patent depicts more detail regarding an embodiment of an identification cell array:



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 of references to it and its predecessor patent.[10] By way

[10] *See*, *e.g.*, Finding the Best Patents – Forward Citation Analysis Still Wins, available at http://www.ipwatchdog.com/2016/03/24/finding-best-patents-forward-citation-analysis-still-wins/id=67192/ (last accessed February 13, 2018) ("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%)

of example, the '213 Patent (predecessor to '188 Patent) has been cited in patent documents all over the world more than 260 times by the likes of Advanced Micro Devices[11], Analog Devices Inc.[12], Fujitsu[13], Hewlett Packard[14], Hitachi[15], IBM[16], Intel[17], Intrinsic ID[18], MIT[19], National Semiconductor[20], Nokia[21], Panasonic[22], Philips[23], Samsung[24], STMicroelectronics[25], Synaptics[26], Texas Instruments[27], and Verayo[28]. 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.[29]

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).

[11] *See*, *e.g.*, US6968303
[12] *See*, *e.g.*, US6480136
[13] *See*, *e.g.*, US6862725 and US7062346
[14] *See*, *e.g.*, US6960753 and US6889305
[15] *See*, *e.g.*, US6941536 and US7665049
[16] *See*, *e.g.*, US8214169 and US8619979
[17] *See*, *e.g.*, US7813507 and US7102358
[18] *See*, *e.g.*, US20030204743
[19] *See*, *e.g.*, US7681103 and US7757083
[20] *See*, *e.g.*, US7602666 and US7482657
[21] *See*, *e.g.*, US7356627
[22] *See*, *e.g.*, US7655483 and US8510608
[23] *See*, *e.g.*, WO/2004/017408 and WO/2004/105125
[24] *See*, *e.g.*, US6600686
[25] *See*, *e.g.*, US8745107 and US7334131
[26] *See*, *e.g.*, US8698594 and US9697411
[27] *See*, *e.g.*, US6952623
[28] *See*, *e.g.*, US8782396 and US8683210
[29] *See*, *e.g.*, US9506983 and US9568540

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

COUNT I
INFRINGEMENT OF U.S. PATENT NO. RE40,188
(AGAINST THE ATHENA GROUP)

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.

36. On information and belief, Athena makes, uses, sells, offers to sell, and/or imports the Dragon-QT security processor; and the Terafire Crypto Microprocessor Family, including the 6400 Series, 64-bit, the 5200 Series, 32-bit, the F5200 Embedded, and the EC Ultra Elliptic Curve (collectively, the "Athena Accused Products").

37. On information and belief, to the extent the preamble of claim 21 of the '188 Patent is limiting, the Athena Accused Products comprise an apparatus in an integrated circuit (IC) for generating an identification number (ID) identifying the IC. For example, the Athena 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 Athena 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 chip fingerprint called the SRAM PUF response ("generating an identification number identifying the IC").

38. On information and belief, the Athena 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 Athena 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 Athena 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

Athena 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 Athena Accused Products, Athena has injured UPF and is liable to UPF for directly infringing one or more claims of the '188 Patent, including at least Claim 1, pursuant to 35 U.S.C. § 271(a).

41. Additionally, on information and belief, Athena has had knowledge of the '188 Patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, Athena knew of the '188 Patent and knew of its infringement, including by way of this lawsuit.

42. On information and belief, Athena intended to induce patent infringement by third-party customers and users of the Athena Accused Products and had knowledge that the inducing acts would cause infringement or was

willfully blind to the possibility that its inducing acts would cause infringement. Athena specifically intended and was aware that the normal and customary use of the accused products would infringe the '188 Patent. Athena performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '188 Patent and with the knowledge that the induced acts would constitute infringement. For example, Athena provides the Athena 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 Athena further provides documentation and training materials that cause customers of the Athena 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 Athena Accused Products, Athena specifically intended to induce infringement of the '188 Patent, including at least claim 21. On information and belief, Athena engaged in such inducement to promote the sales of the Athena Accused Products and to actively induce its customers to infringe the '188 Patent. Accordingly, Athena has induced and continues to induce users of the 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.

43. As a result of Athena's infringement of the '188 Patent, UPF has

suffered monetary damages, and seeks recovery in an amount adequate to compensate for Athena's infringement, but in no event less than a reasonable royalty for the use made of the invention by Athena together with interest and costs as fixed by the Court.

44. Upon information and belief, Athena's infringing activities have continued and are continuing with knowledge of the '188 Patent, and with knowledge of their 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. Athena's acts of infringement have therefore been 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 Athena has infringed the '188 Patent, either literally and/or under the doctrine of equivalents;
2. An award of damages resulting from Athena's acts of infringement in accordance with 35 U.S.C. § 284;
3. A judgment and order requiring Athena to provide accountings and to pay supplemental damages to UPF, including, without limitation, prejudgment and post- judgment interest;
4. A finding of willful infringement by Athena and an award to UPF of

enhanced damages pursuant to 35 U.S.C. § 284; and

5. Any and all other relief to which UPF may show itself to be entitled.

JURY TRIAL DEMANDED

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

Respectfully submitted, this 26th day of February, 2018.

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