

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

OS-New Horizon Personal Computing
Solutions Ltd.,

Plaintiff,

vs.

Samsung Electronics Co., Ltd., and
Samsung Electronics America, Inc.

Defendants.

Case No.

COMPLAINT

DEMAND FOR JURY TRIAL

PLAINTIFF’S ORIGINAL COMPLAINT

Plaintiff OS-New Horizon Personal Computing Solutions Ltd. (“OSNH”) alleges as follows for its patent infringement complaint against Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung” or “Defendants”).

NATURE OF THE ACTION

1. This is a civil action for the willful infringement of U.S. Patent No. 8,401,875 (the “’875 Patent”)¹ arising under 35. U.S.C. § 100, *et seq.*, and particularly § 271, pertaining to at least Samsung Galaxy S21, S22, S23, and S24 smartphones.

PARTIES

2. Plaintiff OSNH is an Israeli company with a principal place of business located at Migdal Oz Street, 6/6 Modi’in+Macabim-Re’ut 7170324, Israel.

3. Defendant Samsung Electronics Co., Ltd. (“SEC”) is a corporation organized under the laws of the Republic of Korea with a principal place of business located at 129 Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, South Korea.

4. Defendant Samsung Electronics America, Inc. (“SEA”) is a New York corporation

¹ The ’875 Patent is attached as **Exhibit 1**, and a patent infringement claim chart is introduced in the counts of infringement, *infra* ¶¶ 59–65, as **Ex. 2**.

with a principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. SEA is registered to do business in the state of Texas, possesses Texas Taxpayer Number 11329511536, and maintains various regular and established places of business within the Eastern District of Texas.

5. On information and belief, SEA is a wholly owned subsidiary of SEC and, at all times relevant to the allegations herein, has acted in concert with and/or at the direction of SEC.

JURISDICTION AND VENUE

6. The Court has subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a) because it arises under the patent laws of the United States.

7. This Court has personal jurisdiction over SEC and SEA because, directly or through intermediaries, each has committed acts within the Eastern District of Texas giving rise to this action and/or has established minimum contacts within the Eastern District of Texas such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice.

8. For example, on information and belief, SEA maintains regular and established places of business within this District, including at least at 6625 Excellence Way, Plano, Texas. Further, on information and belief, SEC directs and controls the actions of SEA such that it too maintains regular and established offices in the Eastern District of Texas, including at 6625 Excellence Way, Plano, Texas 75023.

9. SEA also publicly indicated in early 2019 that it would be centralizing multiple offices in a new location in the Eastern District of Texas at the Legacy Central office campus, located at 6625 Declaration Drive, Plano, Texas 75023. **Ex. 3**, *Samsung Electronics America to Open Flagship North Texas Campus*, SEA (Apr. 6, 2018), at 2. On information and belief, SEA may be served with process through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

10. SEA employs or will employ more than 1000 full-time personnel, such as those involved with “Mobile [and] Mobile R&D” in this District. *Id.*

11. Additionally, SEC and SEA have placed or contributed to placing infringing

products (including Accused Products, *infra* at 44) into the stream of commerce through an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Eastern District of Texas.

12. On information and belief, SEC and SEA have purposefully imported to, and offered to sell and sold within, the United States and this District, infringing smartphones manufactured by SEA (including Accused Products) through, at least, the Samsung Experience Store. **Ex. 4, *Samsung Experience Stores Near Me.***

13. On information and belief, the Samsung Experience Store within this District is operated by, or at the direction of, SEA. **See Ex. 5, *Discover the Galaxy: New Samsung Experience Opens in Frisco, TX***, SEA (Feb. 18, 2022), at 2 (SEA Senior Vice President of Retail Operations and DTC of SEA stated, “That’s why I’m so excited about *our* fifth Samsung Experience Store, opening on February 18th at the Stonebriar Mall in Frisco, TX.”) (emphasis added).

14. Venue is proper as to SEC in this District under 28 U.S.C. § 1391(c) because, among other things, SEC is a foreign corporation. SEC is not a resident of the United States and may be sued in this District because lawsuits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

15. Venue is proper as to SEA in this District under 28 U.S.C. §§ 1391 and 1400(b) because, among other things, SEA has a regular and established place of business in this District, engaged in a substantial number of events giving rise to OSNH’s claims in this District, and has committed acts of infringement in this District.

FACTUAL BACKGROUND

16. This action concerns Samsung’s unauthorized use of patented technology directed to the protection of highly sensitive smartphone user data through the use of a segregated computational subsystem that can be accessed through biometric and life sign authentication. Such technology not only safeguards user data but can also be used to access a wide range of electronic services.

17. Specifically, OSNH’s claims are directed to Samsung’s willful infringement of

intellectual property rights when, after being shown OSNH’s data security technology (the POMM device), Samsung subsequently misappropriated those technologies to develop its own infringing system, Knox Vault, which is integrated in at least Samsung’s flagship Galaxy smartphones that possess Fingerprint Unlock or Face Unlock.

18. Smartphone security is a well-known problem. These devices are repositories of “photos, locations, personal messages and more.” **Ex. 6**, *The Evolution of Hardware Isolation for Smartphones*, Privoro (2024), at 3.

19. According to Samsung, smartphones are “the most *personal* computers anyone had ever built.” **Ex. 7**, *Understanding Samsung Knox Vault: Protecting the data that matters most*, SEA (Mar. 8, 2021), at 3 (emphasis added). Users store “highly valuable information on their smartphones – not just confidential corporate data but also their Blockchain wallet . . . password managers, financial, healthcare, or even classified defense information . . .” *Id.* at 7.

OSNH and its POMM Device

20. Plaintiff OSNH is an Israeli technology entity founded in 2010 focused on the development of biometrically secure devices. One of its products, called POMM, was a data storage and management device that could also serve as a token to access services, such as but not limited to, those pertaining to health, insurance, finance, or traditional web-based systems. The POMM device, which was based on the technology described in the ’875 Patent, is shown below:



21. The POMM device possessed novel technology to mitigate user security risks through an isolated subsystem with its own processor, memory, and software/operating system. Isolated from the main functions of a smartphone, the POMM technology provided a physical, instead of a logical (*i.e.*, software based), segregation to protect sensitive user information, such as but not limited to, biometric data.

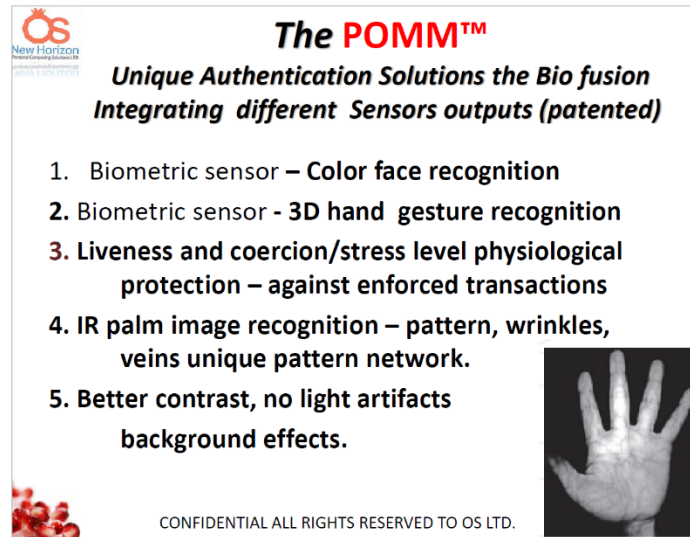
22. In 2016 and 2017, OSNH, through a related Atlanta, GA based company POMM, Inc., began to demonstrate the POMM device.



Cybertech Israel (2017), <https://www.youtube.com/watch?v=Cz8UITPAlyo> (last visited Jul. 11,

2024).

23. One feature of the POMM device and the '875 Patent was biometric security:



24. Another feature of the POMM device and the '875 Patent was improved memory security over the systems present in smartphones of the time. For example, the “earliest approach for barricading a smartphone’s security subsystem [was] the trusted execution environment (TEE), a **virtualized** environment that’s separated from the user-facing [operating system].” **Ex. 6, supra, *The Evolution of Hardware Isolation for Smartphones***, at 3 (emphasis added).

25. In more simple terms, smartphones of that era attempted to segregate data through libraries within a single storage unit.

26. On information and belief, the first TEE on smartphones, called TrustZone, “was first made available in ARM processors in 2004” and was “the standard TEE architecture for Android smartphones.” *Id.*

27. TrustZone “consist[ed] of two **virtual** processors: a ‘secure world’ for the security subsystem and a ‘non-secure’ world for everything else, including the Android OS and user apps. The secure world ha[d] its own OS, apps and privileges.” *Id.* (emphasis added). Unlike the POMM device (and the '875 Patent), TrustZone only logically separated the storage of sensitive authentication information from other non-sensitive information on the device. It did not store

sensitive information in a physically separate storage unit.

28. Certain Samsung smartphones use, or have used, this older technology, TrustZone. **Ex. 8**, *Knox Documentation, Knox Vault*, SEC, at 1 (Feb. 20, 2024).

29. Unlike TrustZone, POMM and the '875 Patent secured sensitive information through an isolated hardware memory system. The inventors knew that physical hardware security was more effective than mere software-based isolation techniques. The benefits of separate memory, over the older single memory design, are well documented as hackers using “phishing,” “man in the middle,” “fuzzing,” “side-channel” attacks, or other techniques can target data transfers during internet communications to gain entry to a device’s active storage unit. **Ex. 6**, *supra*, *The Evolution of Hardware Isolation for Smartphones*, at 3.

30. Prior to the '875 Patent, smartphone manufacturers needed a means to ensure that sensitive personal information and security parameters were “protected in case the main operating system [was] compromised.” *Id.* at 1.

31. When highly sensitive information, such as biometric parameters and encryption keys, are stored in the same active storage unit as other general device data, hackers may more easily intercept communications, gain access to sensitive data, and use it for malicious purposes—even if such sensitive information was contained in a TEE. *See, e.g., id.* at 3 (“Given its close proximity to the main OS, a TrustZone-based TEE is susceptible to a number of attack methods from a hacker who’s gained kernel-level privileges.”).

32. The '875 Patent solved these problems. It taught a device with multiple storage units to prevent hackers from accessing sensitive information. For example, biometric parameters and encryption keys were stored in a separate storage unit isolated from the activities occurring in the more exposed main memory containing items such as emails, text messages, and applications.

33. By providing a secure hardware and software environment isolated from the mobile device, POMM and the '875 Patent solved a long-standing problem in the computational arts, effectively securing sensitive data, such as financial, health, and identification information.

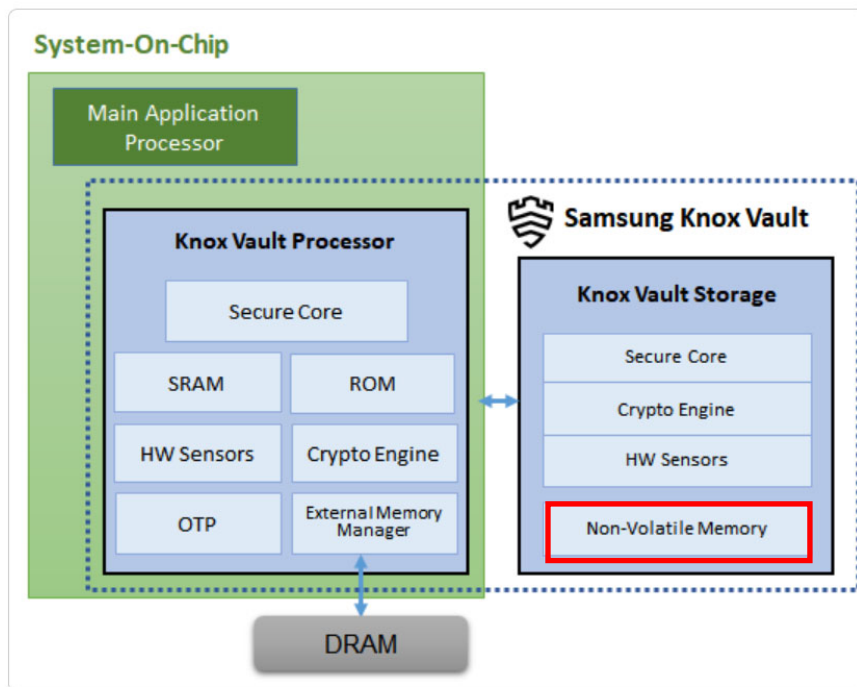
34. Eventually, Samsung, too, realized that mere memory partitioning was insufficient

protection for smartphones that are in contact with a wide variety of unsecure data sources. It analogized the problem in terms of a local bank: “TrustZone was a great safe in the middle of your bank’s branch office. There are a lot of people you don’t necessarily trust walking by the safe, doing day-to-day work that doesn’t require physical access to the safe.” **Ex. 7**, *supra*, *Understanding Samsung Knox Vault: Protecting the data that matters most*, at 5. Separate memory was better: “a safe [(Samsung Knox Vault)] securely placed far away from the bank, isolated from whoever walks into the branch.” *Id.*

35. On information and belief, by 2021 Samsung embraced separate physical storage units in most of its Galaxy devices—a concept OSNH invented and patented over a decade earlier. In fact, Samsung’s product manager for Knox conceded that while software memory segregation (e.g., TrustZone) was “*mostly* independent . . . there remain[ed] overlaps and shared resources . . . CPU and memory . . .” *Id.* at 4 (emphasis in original). For at least these reasons, Samsung developed its “isolated secure memory” as part of a new security offering: Knox Vault.

36. With the launch of the Galaxy S21 series, Samsung upgraded its flagship smartphone line to include the “Knox Vault.” **Ex. 9**, *Samsung Executive Daniel Ahn Outlines the Latest Security Innovation Keeping the Galaxy S21 Series Protected, Samsung Knox Vault* (Feb. 10, 2021).

37. With Knox Vault, Samsung finally realized one of the teachings of the ’875 Patent, that “isolation increases security.” **Ex. 7**, *supra*, *Understanding Samsung Knox Vault: Protecting the data that matters most*, at 4. According to SEC, “a core component of the Knox security platform is an isolated . . . memory.” **Ex. 8**, *supra*, *Knox Documentation, Knox Vault*, at 1.



Id. at 1 (emphasis added).

The '875 Patent

38. By at least the summer of 2007, the inventors of the '875 Patent had conceived of Claim 1. Diligent development efforts thereafter followed.

39. On March 12, 2010, the inventors filed an application which resulted in the issuance on March 19, 2013 of the '875 Patent, entitled “Secured Personal Data Handling and Management System.”

40. OSNH is the assignee and owner of all rights, title, and interest in and to the '875 Patent, including the right to assert all causes of action arising under the '875 Patent and the right to all remedies for its infringement.

41. The '875 Patent teaches techniques for securing information.

42. One feature of the invention is the use of biological biometric and life sign identification parameters to access information. Another feature of the '875 Patent is that it teaches two storage units (a first storage for storing a user’s data and documentation files and a second storage for storing the biometric identification parameters) to increase security, which was

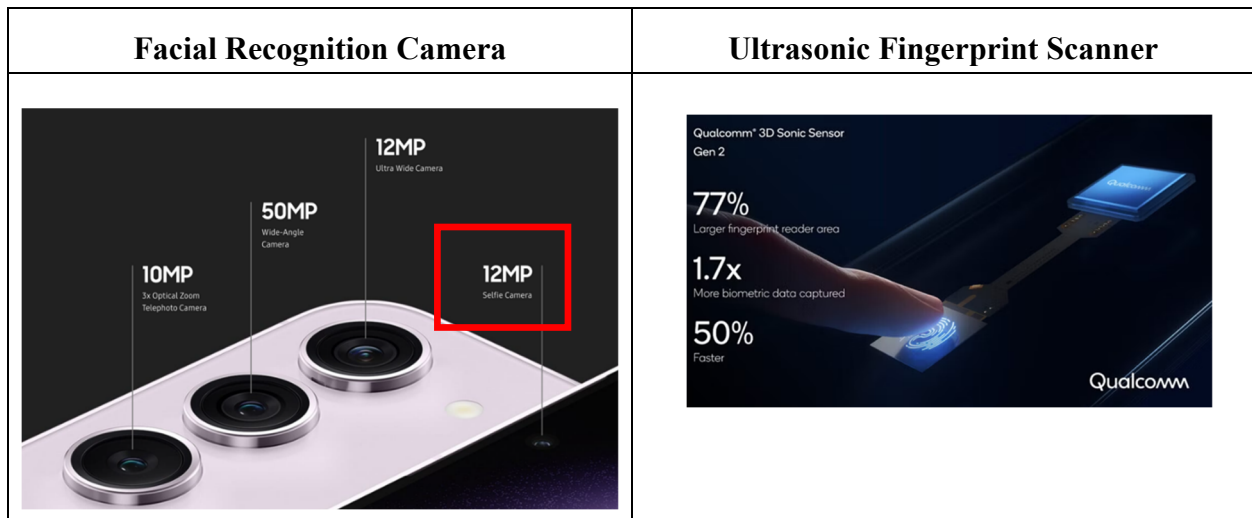
unconventional at the time of the invention but is commonplace today. *Supra* at ¶¶ 32–37.

43. The '875 Patent also includes claims for a secure wireless payment system like the one designed for the POMM device.

Samsung's Infringement

44. The Accused Products are Samsung devices for storing and managing personal and secure data and files that include Knox Vault, the Face Unlock feature, and the Fingerprint Unlock feature (with devices that include an ultrasonic fingerprint sensor). On information and belief, infringing Samsung devices include but are not limited to: Galaxy S21, S21+, S21 Ultra, S22, S22+, S22 Ultra, S23, S23+, S23 Ultra, S24, S24+, and S24 Ultra smartphones.²

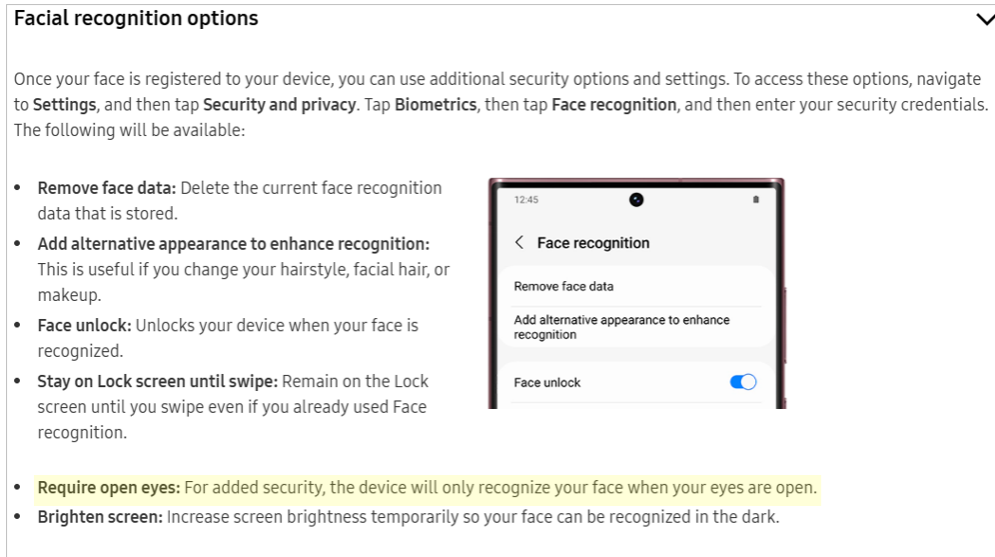
45. The infringing Samsung devices include at least the Galaxy S21 and subsequently released Galaxy S smartphones. These devices all include Knox Vault and pertinent associated elements. For example, they all have a plurality of integrated biological biometric and life signs sensors. As shown below, they include at least a front facing camera for facial recognition for the Face Unlock feature and an ultrasonic fingerprint scanner with an integrated subcutaneous blood flow function to read a user's unique fingerprints and blood flow for the Fingerprint Unlock feature.



² Publicly available information suggests that the Accused Products do not include the Galaxy S21 FE and S23 FE.

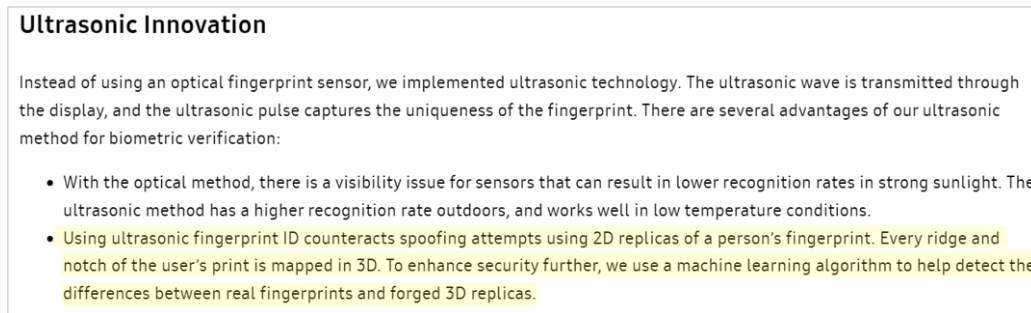
<p>Ex. 10, <i>Galaxy S23</i>, SEA, at 1 (emphasis added).</p>	<p>Ex. 11, <i>The Galaxy’s S21’s new Qualcomm fingerprint scanner should finally fix the problems with the last-gen</i>, XDA, at 3 (Jan. 15, 2021).</p>
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46. Galaxy S smartphones also include additional relevant life signs detectors. For instance, the Galaxy’s Face Unlock feature can determine if a user’s eyes are open (below) to prevent spoofing:



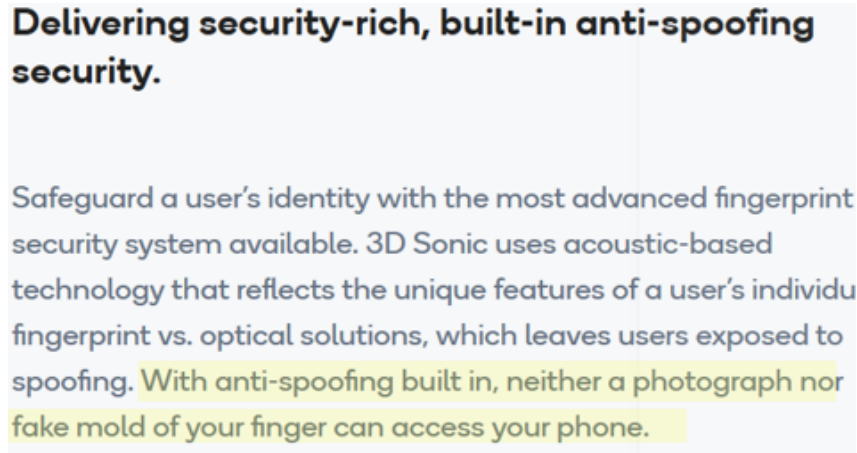
Ex. 12, *Use Facial recognition security on a Galaxy phone or tablet*, SEA (2024) (emphasis added).

47. The Fingerprint Unlock feature also includes a life signs detector. The fingerprint detector uses ultrasonic waves to create a 3D topographic map of a user’s finger, preventing spoofing attempts using forged replicas:



Ex. 13, *Ultrasonic Unlock: The Innovation Behind Samsung’s In-Display Fingerprint ID*,

Samsung for Business, at 2 (Oct. 21, 2019) (emphasis added).

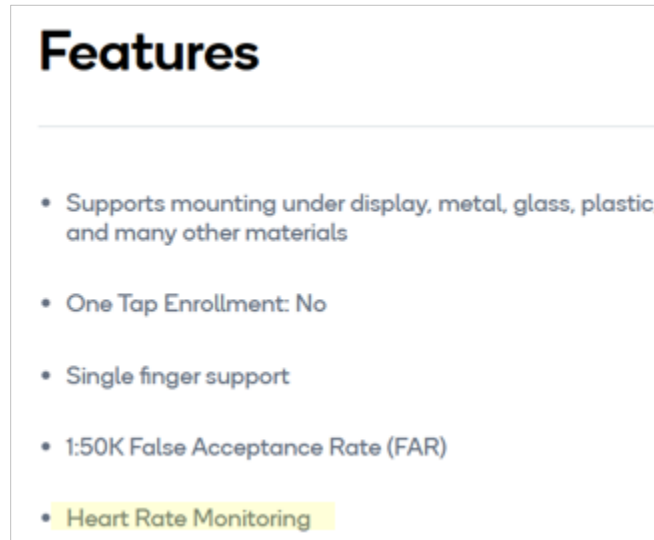


Ex. 14, *Qualcomm 3D Sonic Sensor*, at 2.

48. On information and belief, the fingerprint detector further monitors blood flow to distinguish between fingerprints on a live human and forged molds. The ultrasonic fingerprint scanner incorporated into the accused Galaxy S smartphones is manufactured by Qualcomm, and on information and belief, includes 3D anti-spoofing and a sub-dermal liveness and heart rate monitor:



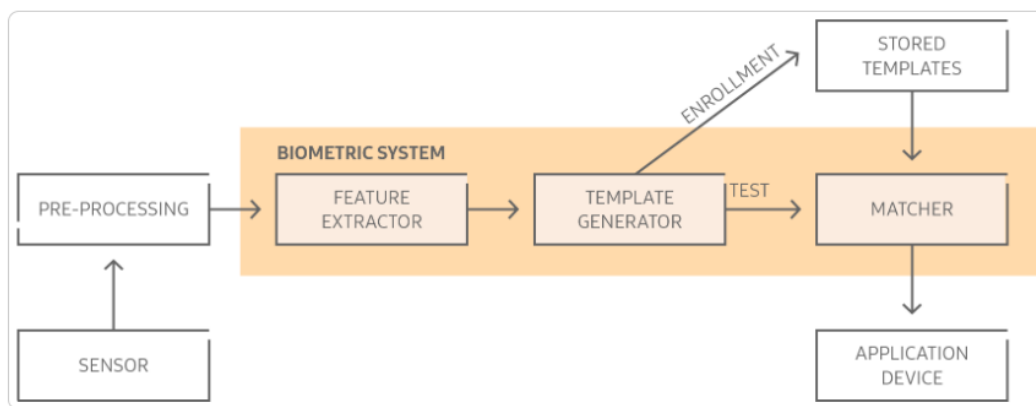
Ex. 15, Vishal Kawadkar, *How Qualcomm's 3D Sonic Fingerprint Sensor Could Be A Great Tool In Covid-19 Era*, at 3 (Jan. 12, 2021) (emphasis added).



Ex. 16, *3D Sonic Gen 2 Overview*, Qualcomm, at 2 (emphasis added).

49. During the Face Unlock and Fingerprint Unlock process, the Knox Vault compares incoming data from the biosensors (e.g., camera and fingerprint sensors) to the stored templates to determine if there is a valid match. If there is a valid match, the Galaxy S device is unlocked or permission to use an application (e.g., Samsung Wallet/Pay) is granted.

Unique advantages of Knox Biometrics



Ex. 17, *Samsung Knox Documentation* (Feb. 20, 2024).

Samsung’s Knowledge of the ’875 Patent

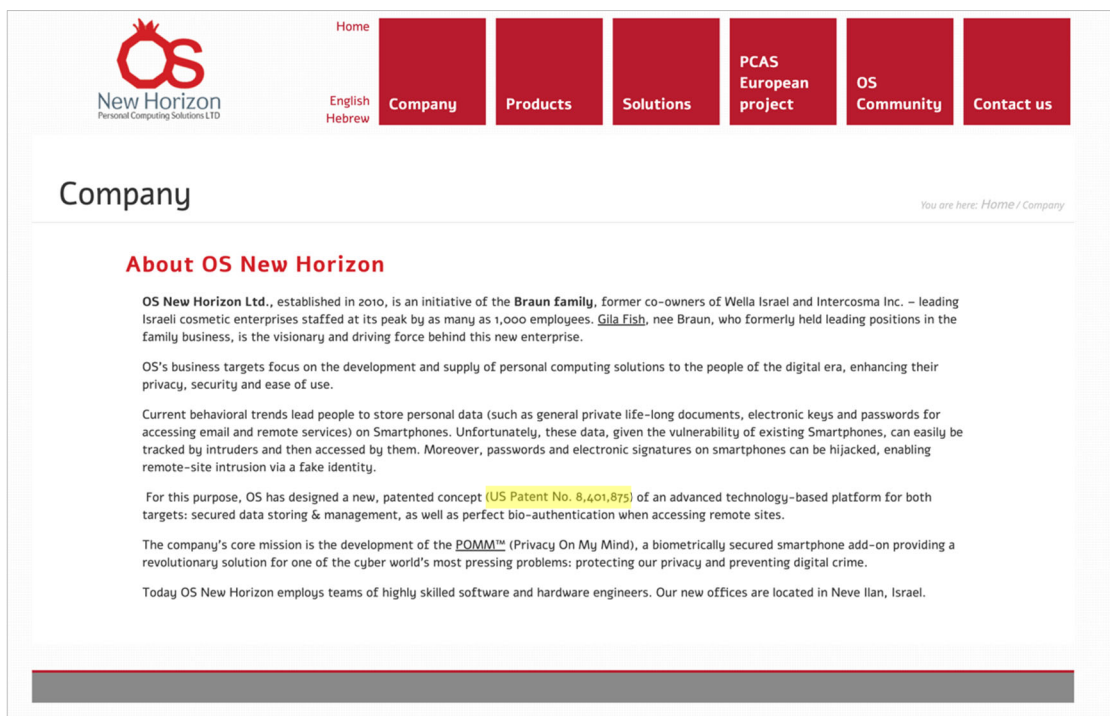
50. On information and belief, SEC had knowledge of the ’875 Patent by at least 2014.

51. In July 2014, SEC, through its Samsung Electronics Open Innovation Group

(which, on information and belief it directs and controls), contacted OSNH to learn more about the company because Samsung was looking for “solutions/products/innovations for mobile that could be preinstalled in Samsung future devices.”

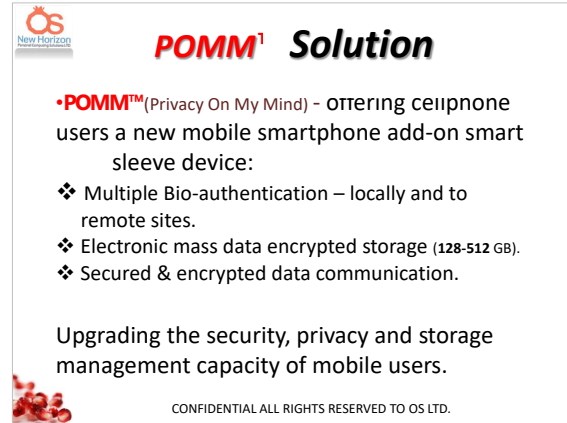
52. With respect to the POMM device, SEC requested that OSNH describe “unique features [and] technological differentiation.”

53. OSNH provided the requested information and directed SEC to the company website, where the asserted ’875 Patent was disclosed:



Ex. 18, OSNH website (archive of www.osnewhorizon.com on *Wayback Machine* Dec. 18, 2014) (emphasis added). The screen capture above was present on the website since at least January 2014.

54. Moreover, in response to SEC’s request for “technological differentiation,” OSNH sent SEC a one-page summary indicating that the company had a “Patent Granted in the US,” which at the time was the only one it possessed. OSNH also provided SEC presentation materials that described the POMM device and its benefits:



55. These discussions continued into at least December 2017, at which point, on information and belief, SEC expressed interest in *integrating* some of OSNH's POMM technologies into Samsung smartphones.

56. The technology of the '875 Patent was foundational to the infringing Samsung devices.

57. For its Knox Vault security offering, Samsung coopted OSNH's innovative technology that created a walled garden for highly secure processing, authentication, and storage of sensitive data.

58. On information and belief, after approximately three years of interactions with OSNH, SEC either knew the Accused Products infringed the '875 Patent or knowingly and willfully avoided assessing whether the Accused Products infringed the '875 Patent.

COUNT ONE

Patent Infringement By Samsung Electronics Co., Ltd

59. OSNH incorporates by reference each of the preceding paragraphs of this Complaint.

60. SEC has infringed and continues to directly infringe at least claims 1, 4 and 15 of the '875 Patent, pursuant to 35 U.S.C. § 271(a), literally or under the doctrine of equivalents, through its making, using, selling, offering for sale, and/or importing into the United States the Accused Products. For example, SEC's infringement of the '875 Patent is shown in the claim chart

attached hereto. **Ex. 2.**

61. SEC has had notice of the '875 Patent since at least 2014, and no later than the service of this Complaint. Moreover, since at least the development of the Accused Products, SEC has known that its actions concerning those products constitute infringement of the '875 Patent. Therefore, SEC's infringement has been willful and deliberate ever since.

62. Accordingly, SEC's infringement of the '875 Patent has injured OSNH's intellectual property rights in an amount to be determined at trial.

COUNT TWO

Patent Infringement By Samsung Electronics America, Inc.

63. OSNH incorporates by reference each of the preceding paragraphs of this Complaint.

64. SEA has infringed and continues to directly infringe at least claims 1, 4 and 15 of the '875 Patent, pursuant to 35 U.S.C. § 271(a), literally or under the doctrine of equivalents, through its making, using, selling, offering for sale, and/or importing into the United States the Accused Products. For example, SEA's infringement of the '875 Patent is shown in the claim chart attached hereto. **Ex. 2.**

65. Accordingly, SEA's infringement of the '875 Patent has injured OSNH's intellectual property rights in an amount to be determined at trial.

PRAYER FOR RELIEF

WHEREFORE, OSNH respectfully prays for relief as follows:

- A. Judgment that Samsung has infringed one or more claims of the '875 Patent;
- B. An award of damages pursuant to 35 U.S.C. § 284 in an amount sufficient to compensate OSNH for the harm caused by Defendants' infringement, not less than a reasonable royalty, along with pre- and post-judgment interest;
- C. Judgment that SEC's infringement of the '875 Patent has been willful and deliberate;

- D. An award of enhanced damages for SEC' infringement, in accordance with 35 U.S.C. § 284;
- E. An order for an accounting of damages from Samsung's infringement;
- F. Declare this case exceptional and award OSNH its costs, expenses, and attorneys' fees pursuant to 35 U.S.C. § 285; and
- G. An order awarding to OSNH such other and further relief, whether at law or in equity, that this Court finds just, equitable, and proper.

JURY DEMAND

Pursuant to Federal Rule of Civil Procedure 38(b) and Civil Local Rule 38, OSNH hereby demands a trial by jury on all issues so triable.

Dated: August 5, 2024

By: /s/ Deron R. Dacus

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