

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

As shown below and by references herein to Appendix 11, technical specifications show that each of the Accused Samsung '417 Products include all necessary hardware, operating systems, and software required by each of claims 1-3 and 7 of the '417 Patent. For example, each of the Accused Samsung '417 Products includes a processor (*e.g.*, an Application Processor), and a clock controller that changes the frequency of a clock signal fed to the processor to a first frequency in an open condition, a lower second frequency in a closed condition, and a frequency higher than the second frequency when a specific processing (*e.g.*, image decoding) is executed while the terminal is in the closed condition. *See, e.g.*, Appendix 11 (identifying the technical specifications of the Accused Samsung '417 Products confirming the same). Thus, each of the Accused Samsung '417 Products infringes based on the same theories as shown herein because they each include the same components and implement the same functionalities when performing processor-intensive tasks like using the camera while the device is in a standby or closed state as shown below.

Further, the four exemplary devices highlighted below, namely the Galaxy S23 (a flagship model), the Galaxy Z Fold4 (a foldable model), the Galaxy Z Flip4 (a foldable model) and the Galaxy A54 5G (a mid-range model with a different processor architecture), were deliberately selected to demonstrate that the accused power management functionality is a common feature across Samsung's product tiers, regardless of form factor or the specific processor used.

The core accused functionality—changing processor clock speeds based on the device’s operational state (*e.g.*, open vs. closed)—is a fundamental feature of the mobile operating system and power management software. This functionality is common to both the accused smartphones and tablets, making the detailed analysis of the representative phones sufficient to provide notice for the remaining Accused Samsung ’417 Product, including tablets.

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
[1.pre] A mobile terminal capable of being changed from an open	Each of the Accused Samsung '417 Products ¹ is a mobile terminals units capable of being changed from an open condition into a closed condition. <i>See, e.g.</i> , Technical Specifications of each of the

¹ The Accused Samsung '417 Products include the Galaxy A Quantum; Galaxy A03s; Galaxy A04s; Galaxy A10s; Galaxy A11; Galaxy A12; Galaxy A12s (aka Nacho); Galaxy A13; Galaxy A13 5G; Galaxy A14; Galaxy A14 5G; Galaxy A20; Galaxy A20e; Galaxy A20s; Galaxy A21; Galaxy A21s; Galaxy A22; Galaxy A22s 5G; Galaxy A23; Galaxy A23 5G; Galaxy A24 4G; Galaxy A30; Galaxy A30s; Galaxy A32; Galaxy A32 5G; Galaxy A33 5G; Galaxy A34; Galaxy A40; Galaxy A42 5G; Galaxy A50; Galaxy A50s; Galaxy A51; Galaxy A51 5G; Galaxy A51 5G UW; Galaxy A52; Galaxy A52 5G; Galaxy A53 5G; Galaxy A54 5G; Galaxy A60; Galaxy A70; Galaxy A70s; Galaxy A71; Galaxy A71 5G; Galaxy A71 5G UW; Galaxy A72; Galaxy A73 5G; Galaxy A8; Galaxy A8+; Galaxy A80; Galaxy A90 5G; Galaxy Fold; Galaxy Fold 5G; Galaxy Note10; Galaxy Note10 5G; Galaxy Note10 Lite; Galaxy Note10+; Galaxy Note10+ 5G; Galaxy Note20; Galaxy Note20 5G; Galaxy Note20 Ultra; Galaxy Note20 Ultra 5G; Galaxy Note9; Galaxy S10; Galaxy S10 5G; Galaxy S10 Lite; Galaxy S10+; Galaxy S10e; Galaxy S20; Galaxy S20 5G; Galaxy S205G UW; Galaxy S20 FE; Galaxy S20 FE 5G; Galaxy S20 Ultra; Galaxy S20 Ultra 5G; Galaxy S20+; Galaxy S20+ 5G; Galaxy S21 5G; Galaxy S21 FE 5G; Galaxy S21 Ultra 5G; Galaxy S21+ 5G; Galaxy S22 5G; Galaxy S22 Ultra 5G; Galaxy S22+ 5G; Galaxy S23; Galaxy S23 FE; Galaxy S23 Ultra; Galaxy S23+; Galaxy S24; Galaxy S24+; Galaxy S24 Ultra; Galaxy S9; Galaxy S9+; Galaxy Xcover FieldPro; Galaxy Xcover Pro; Galaxy Xcover6 Pro; Galaxy Z Flip; Galaxy Z Flip 5G; Galaxy Z Flip3 5G; Galaxy Z Flip4; Galaxy Z Flip5; Galaxy Z Fold2 5G; Galaxy Z Fold3 5G; Galaxy Z Fold4;

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
condition into a closed condition, comprising:	Accused Samsung '417 Products available at Samsung's website showing that each of the devices is a mobile terminal capable of being changed from an open condition into a closed condition (https://www.samsung.com/us/smartphones/). For example, the Samsung Galaxy S23 is a mobile terminal (<i>i.e.</i>, a smartphone) that can change between a locked condition and an unlocked condition, corresponding to the claimed closed condition and open condition, respectively.  The image shows the Samsung Galaxy S23 product page. On the left is a vertical image of the phone in its closed state. To the right of the phone image are the following specifications: Released 2023, February 17; 168g, 7.6mm thickness; <> Android 13, up to 4 major upgrades; 128GB/256GB/512GB storage, no card slot. Below these are two icons: a screen icon with '6.1" 1080x2340 pixels' and a camera icon with '50MP 4320p'.

Galaxy Z Fold5; Galaxy Tab Active Pro; Galaxy Tab Active3; Galaxy Tab Active4 Pro; Galaxy Tab S5e; Galaxy Tab S6; Galaxy Tab S6 5G; Galaxy Tab S7; Galaxy Tab S7+; Galaxy Tab S8; Galaxy Tab S8 Ultra; Galaxy Tab S8+; Galaxy Tab S9; Galaxy Tab S9 FE; Galaxy Tab S9 FE+; Galaxy Tab S9 Ultra; and Galaxy Tab S9+. Maxell reserves the right to accuse additional products as discovery proceeds in this investigation.

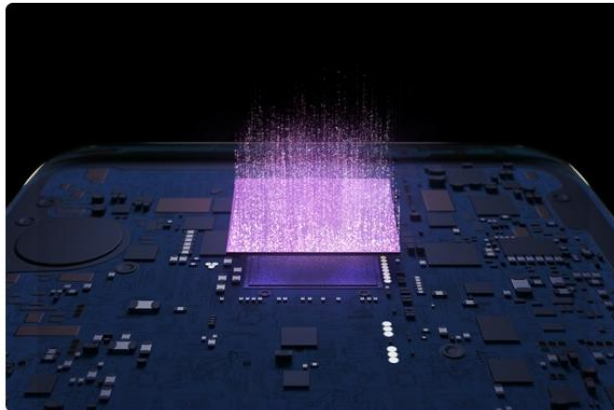
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement												
	 Samsung Galaxy S23 tech specs, http://samsung.com/us/smartphones/galaxy-s23/buy/galaxy-s23-plus-256gb-unlocked-sm-s916ulixaa/  Processor Qualcomm Snapdragon 8 Gen2 Mobile Platform for Galaxy <table><tr><td>PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td></td><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td></td><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td></td><td>GPU</td><td>Adreno 740</td></tr></table> Galaxy S23 Ultra technical specifications; https://www.samsung.com/us/smartphones/galaxy-s23-ultra/buy/galaxy-s23-ultra-512gb-verizon-sm-s918uzgfvzw/?modelCode=SM-S918UZGFXAU; https://www.gsmarena.com/samsung_galaxy_s23_ultra-12024.php.	PLATFORM	OS	Android 13, One UI 5.1		Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)		CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)		GPU	Adreno 740
PLATFORM	OS	Android 13, One UI 5.1											
	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)											
	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)											
	GPU	Adreno 740											

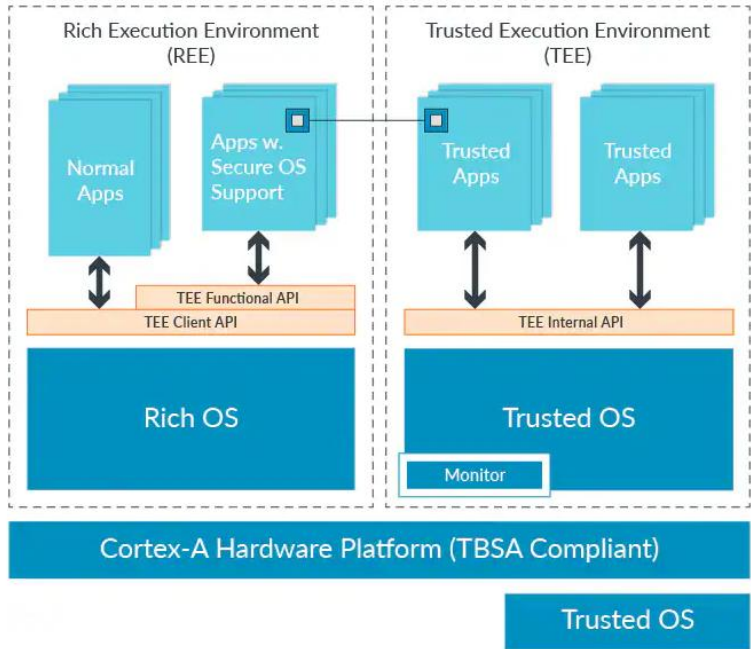
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																								
	 Processor Snapdragon 8+ Gen 1 Up to 3.2GHz <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 12L, upgradable to Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 730</td></tr></table> Galaxy Z Fold4 technical specifications; https://www.samsung.com/us/smartphones/galaxy-z-fold4/buy/galaxy-z-fold4-512gb-att-sm-f936uzeeatt/; https://www.gsmarena.com/samsung_galaxy_z_fold4-11737.php.  Processor Snapdragon 8+ Gen 1 Up to 3.2GHz <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 12, upgradable to Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 730</td></tr></table> Galaxy Z Flip4 technical specifications; https://www.samsung.com/us/smartphones/galaxy-z-flip4/buy/galaxy-z-flip4-256gb-t-mobile-sm-f721uzdexau/; https://www.gsmarena.com/samsung_galaxy_z_flip4-11538.php. <table><tr><td>Processor</td><td></td></tr><tr><td>CPU Type</td><td>CPU Speed</td></tr><tr><td>Octa-Core</td><td>2.4GHz,2GHz</td></tr></table>	PLATFORM	OS	Android 12L, upgradable to Android 13, One UI 5.1	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)	GPU	Adreno 730	PLATFORM	OS	Android 12, upgradable to Android 13, One UI 5.1	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)	GPU	Adreno 730	Processor		CPU Type	CPU Speed	Octa-Core	2.4GHz,2GHz
PLATFORM	OS		Android 12L, upgradable to Android 13, One UI 5.1																						
	Chipset		Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)																						
	CPU		Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)																						
	GPU	Adreno 730																							
PLATFORM	OS	Android 12, upgradable to Android 13, One UI 5.1																							
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	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)																							
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement									
	Performance  • • • Impressive speed. Powerful processor The powerful Octa-core processor opens up a new range of possibilities with heightened performance and capacity. <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Exynos 1380 (5 nm)</td></tr><tr><td>CPU</td><td>Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)</td></tr><tr><td>GPU</td><td>Mali-G68 MP5</td></tr></table> Galaxy A54 5G technical specifications; https://www.samsung.com/us/mobile/phones/galaxy-a/galaxy-a54-5g-128gb-verizon-sm-a546vzkbvzw/; https://www.gsmarena.com/samsung_galaxy_a54-12070.php For example, upon information and belief, the Accused Samsung '417 Products implement a Trusted Execution Environment (TEE) as secured/enforced/implemented by Samsung Knox to switch between a closed condition into an open condition.	PLATFORM	OS	Android 13, One UI 5.1	Chipset	Exynos 1380 (5 nm)	CPU	Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)	GPU	Mali-G68 MP5
PLATFORM	OS		Android 13, One UI 5.1							
	Chipset		Exynos 1380 (5 nm)							
	CPU		Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)							
	GPU	Mali-G68 MP5								

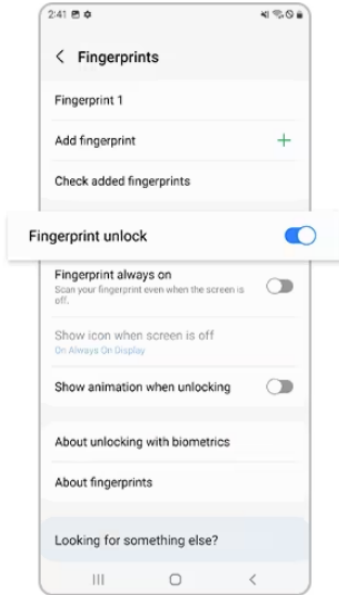
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Development of TEE and Secure Monitor Code  The diagram illustrates the development of a Trusted Execution Environment (TEE) and Secure Monitor Code. It is divided into two main sections: the Rich Execution Environment (REE) and the Trusted Execution Environment (TEE). The REE section shows a stack of 'Normal Apps' and 'Apps w. Secure OS Support' (indicated by a blue square icon) sitting on top of a 'Rich OS' layer. The TEE section shows a stack of 'Trusted Apps' sitting on top of a 'Trusted OS' layer, which includes a 'Monitor' component. Between the REE and TEE, there are two API layers: 'TEE Functional API' and 'TEE Client API' on the left, and 'TEE Internal API' on the right. A line connects the 'Apps w. Secure OS Support' to the 'Trusted Apps'. At the bottom, a blue bar represents the 'Cortex-A Hardware Platform (TBSA Compliant)'. Below this bar, the text 'Trusted OS' is written. There are a wide variety of possible software architectures for the secure world, and the implementation of these is almost totally dependent on the application the user is targeting. A simple implementation may be focused on protecting a single asset which was implemented in a protected factory environment, such as authentication of a single secret. This requires a simple solution comprising of a lightweight secure kernel and integration of the monitor for switching between normal and secure domains. Alternatively the system architect may be looking for a robust and long term solution where trusted applications are appended over the lifetime of the device, for example in a mobile handset or tablet. In this case the designer may opt for a Trusted Execution Environment which mimics many of the dynamic functions of a traditional OS, including sandboxing of applications, while remaining small enough to be certified. Due to the inherent complexity of implementing a full Secure OS, and the potential need to certify its capabilities and performance, Arm recommends investigating commercial TEE solutions from Trusted OS suppliers that are members of GlobalPlatform. However if partners require a simpler solution, or are investigating building their own TEE, then we recommend they start by reviewing example code for the Secure Monitor. See https://www.arm.com/technologies/trustzone-for-cortex-a/tee-and-smc. Additional details regarding Arm TrustZone can be found in Trusted Base System Architecture for Armv8-A (document number DEN 0021F, issued 8/6/2020) available at

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	https://www.arm.com/technologies/trustzone-for-cortex-a. Exemplary excerpts from this document provided below: 7.10.1.3 Unlock operations To perform the state transition from "Closed" to "Open" an unlock operation must be performed by the debug protection mechanism to ensure that the external entity has access to a token that authorizes access to the associated assets. The token might take the form of a simple password or a cryptographically signed certificate. The choice between these often depends on the trade-off between complexity on the device and complexity on a token management server. For example, it is more complicated to implement signature checking on a device than to compare passwords, but managing a database of unique passwords is more complicated than one or two private keys on a server. To prevent the leak of an unlock token that affects multiple devices: <i>R100_TBSA_DEBUG Unlock tokens shall be unique for each device.</i> To ensure that the external entity knows which unlock token to use: <i>R110_TBSA_DEBUG The device shall store a unique ID in Public-Lockable fuses.</i> See also https://www.arm.com/technologies/trustzone-for-cortex-a/tee-and-smc; https://trusted-services.readthedocs.io/en/latest/overview/introduction.html; https://trusted-services.readthedocs.io/en/latest/developer/arch-overview.html How to use and set up fingerprint recognition to unlock the Galaxy S22 Series

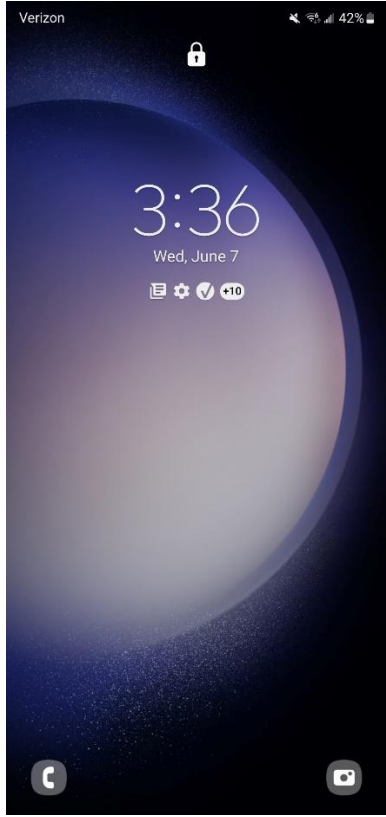
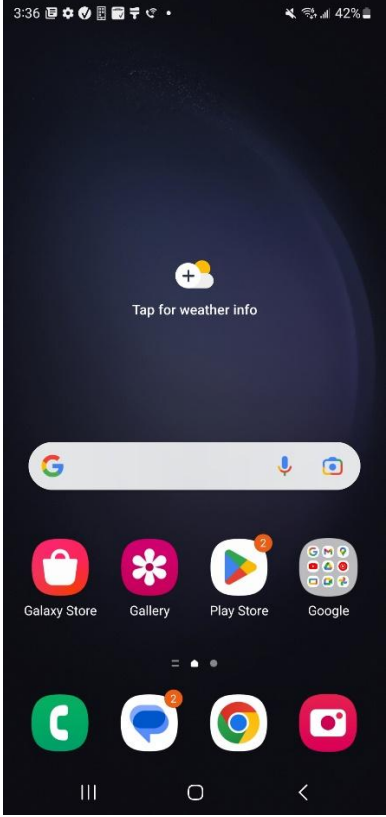
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Unlocking the screen with your fingerprints You can unlock the screen with your fingerprint instead of using a pattern, PIN, or password. Step 1. On the Settings screen, tap Biometrics and security > Fingerprints. Step 2. Unlock the screen using the preset screen lock method. Step 3. Tap the Fingerprint unlock switch to activate it. On the lock screen, place your finger on the fingerprint recognition sensor and scan your fingerprint. 

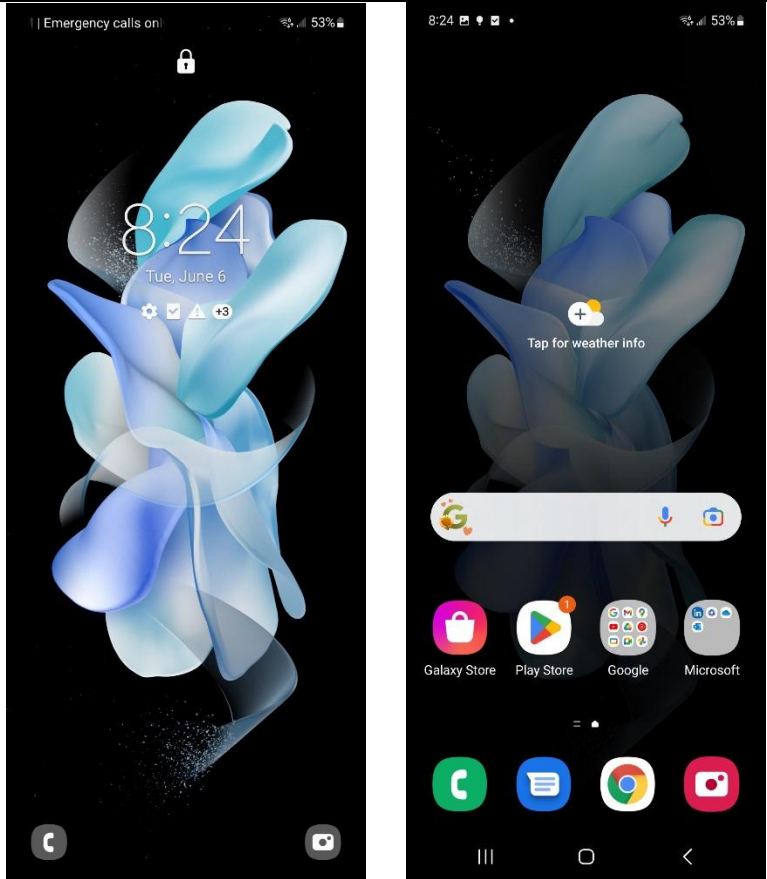
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	If fingerprint recognition is set but the PIN, Pattern, Password release screen appears ^ If you choose biometrics recognition, which includes using Fingerprints or Facial recognition to unlock your phone, the screen which requests your PIN, Pattern or Password may still appear instead of Fingerprints or Facial recognition in some cases according to the policy of Android OS. • If you have used and unlocked the device using Biometrics including Fingerprints or Facial recognition in the past 24 hours. • If 4 hours pass without an additional unlock operation after unlocking your device using Fingerprints or Facial recognition. • If 72 hours pass after unlocking your device using a PIN, Pattern or Password while fingerprint is set as screen lock type. This is an intended response for enhanced security of your device. Additionally, you can only use a PIN, Pattern or Password to unlock the screen after restarting the device or when you don't use the device for more than 24 hours. See https://www.samsung.com/levant/support/mobile-devices/how-to-use-and-set-up-fingerprint-recognition-to-unlock-the-galaxy-s22-series/

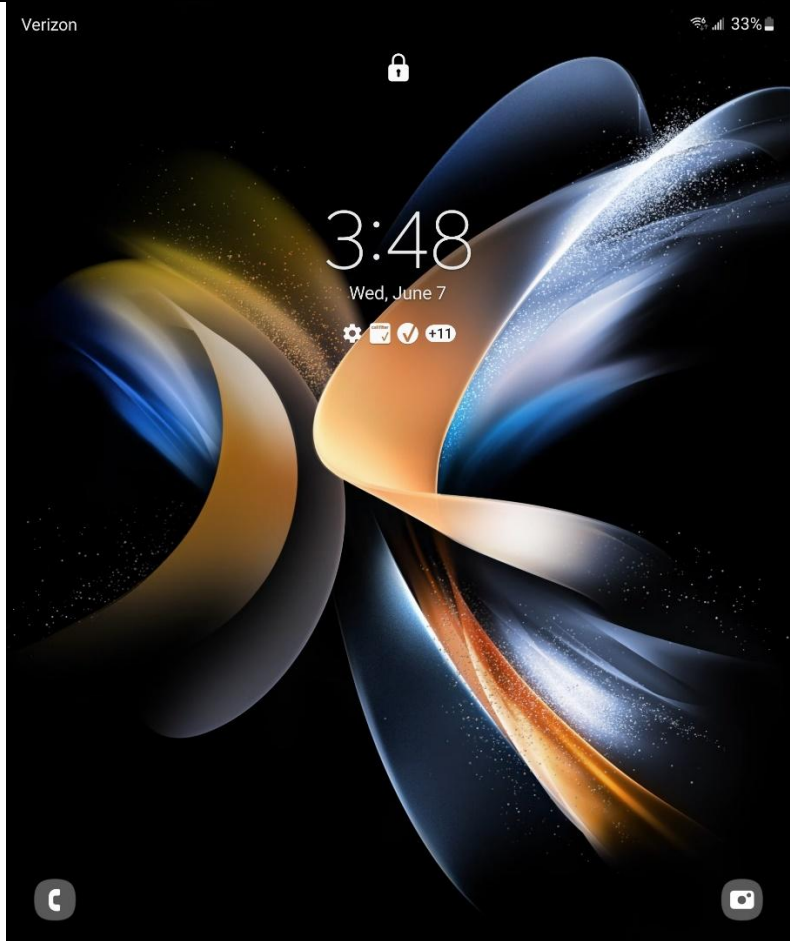
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	A screenshot of a Samsung Galaxy S23 Ultra lock screen. The status bar at the top shows 'Verizon' on the left and signal, Wi-Fi, and 42% battery icons on the right. The background is a dark blue space-themed wallpaper with a large planet. The time '3:36' is displayed in large white digits, with 'Wed, June 7' below it. At the bottom are icons for settings, a checkmark, and a battery level indicator. A screenshot of a Samsung Galaxy S23 Ultra home screen. The status bar at the top shows the time '3:36' and various notification icons. The background is a dark blue space-themed wallpaper. A 'Tap for weather info' prompt is centered. Below is a Google search bar. The dock at the bottom contains icons for Galaxy Store, Gallery, Play Store, Google, Phone, Messages, Chrome, and Camera.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Galaxy Z Flip4 switching between closed and open conditions.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Fold4 switching between closed and open conditions.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Galaxy A54 5G switching between closed and open conditions.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Unlocking the screen with your fingerprints You can unlock the screen with your fingerprint instead of using a pattern, PIN, or password. 1 On the Settings screen, tap Security and privacy → Biometrics → Fingerprints. 2 Unlock the screen using the preset screen lock method. 3 Tap the Fingerprint unlock switch to turn it on. 4 On the locked screen, place your finger on the fingerprint recognition sensor and scan your fingerprint. Changing the fingerprint recognition icon setting Set the device to show or hide the fingerprint recognition icon when you tap the screen while the screen is turned off. 1 On the Settings screen, tap Security and privacy → Biometrics → Fingerprints. 2 Unlock the screen using the preset screen lock method. 3 Tap Show icon when screen is off and select an option. See Galaxy S23 Series User Guide at pgs. 143-145.
[1.a] a processor which executes program processing; and,	Each of the Accused Samsung '417 Products contains a processor which executes program processing. <i>See e.g.</i>, Technical Specifications of each of the Accused Samsung '417 Products available at Samsung's website showing that each of the Accused Samsung '417 Products includes a processor which executes program processing. https://www.samsung.com/us/smartphones/). For example, each of the Accused Samsung '417 Products includes a system-on-chip ("SoC"), such as a Qualcomm Snapdragon platform, that includes a processor (CPU or GPU) to execute a version of Android OS.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																								
	Samsung Galaxy S23 Featuring Snapdragon 8 Gen 2 for Galaxy. Meet the Samsung Galaxy S23, the phone that takes you out of the everyday and into the epic. Powered by Snapdragon 8 Gen 2 for Galaxy, it delivers accelerated performance and unparalleled connectivity. Unlock epic experiences across AI, 5G, gaming, camera, and WiFi and Bluetooth thanks to Qualcomm FastConnect 6900. Life doesn't wait for the perfect lighting, but with Nightography, you are always ready to seize the moment even in low light and snap memories like a pro. Qualcomm, https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s23 <table><tr><td>Processor</td><td></td></tr><tr><td>CPU Type</td><td>CPU Speed</td></tr><tr><td>Octa-Core</td><td>3.36GHz,2.8GHz,2GHz</td></tr><tr><td>OS</td><td></td></tr><tr><td>OS</td><td></td></tr><tr><td>Android</td><td></td></tr></table> Samsung Galaxy S23 tech specs, http://samsung.com/us/smartphones/galaxy-s23/buy/galaxy-s23-plus-256gb-unlocked-sm-s916ulixaa/ <table><tr><td>PLATFORM</td><td>OS</td><td>Android 13, up to 4 major Android upgrades, One UI 6.1.1</td></tr><tr><td></td><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td></td><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td></td><td>GPU</td><td>Adreno 740</td></tr></table> GSM arena, https://www.gsmarena.com/samsung_galaxy_s23-12082.php	Processor		CPU Type	CPU Speed	Octa-Core	3.36GHz,2.8GHz,2GHz	OS		OS		Android		PLATFORM	OS	Android 13, up to 4 major Android upgrades, One UI 6.1.1		Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)		CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)		GPU	Adreno 740
Processor																									
CPU Type	CPU Speed																								
Octa-Core	3.36GHz,2.8GHz,2GHz																								
OS																									
OS																									
Android																									
PLATFORM	OS	Android 13, up to 4 major Android upgrades, One UI 6.1.1																							
	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)																							
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	GPU	Adreno 740																							

Maxell, Ltd.

Ex. 2018

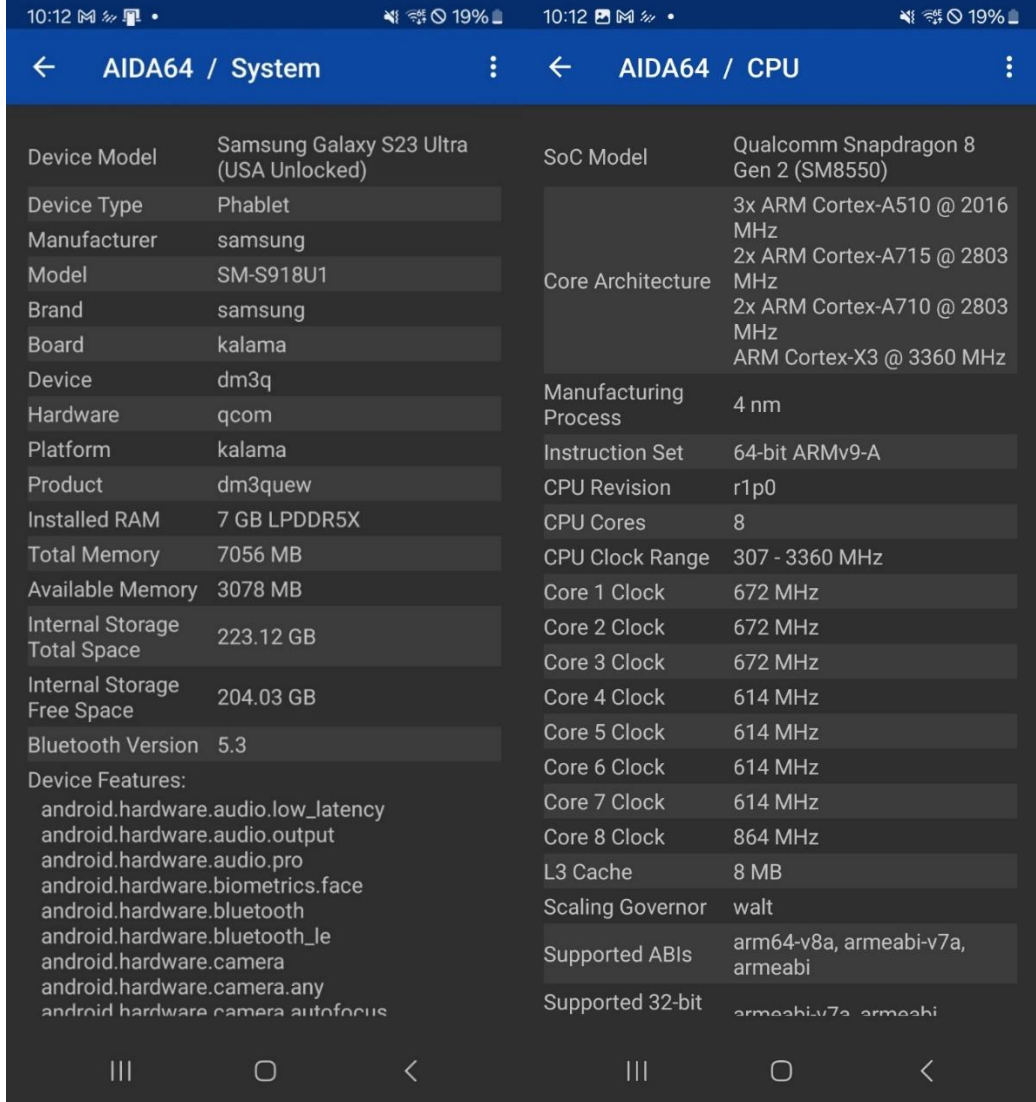
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Further, AIDA64 reports for Samsung products confirm that they include one or more Qualcomm chips to execute program processing (e.g., the operating system):

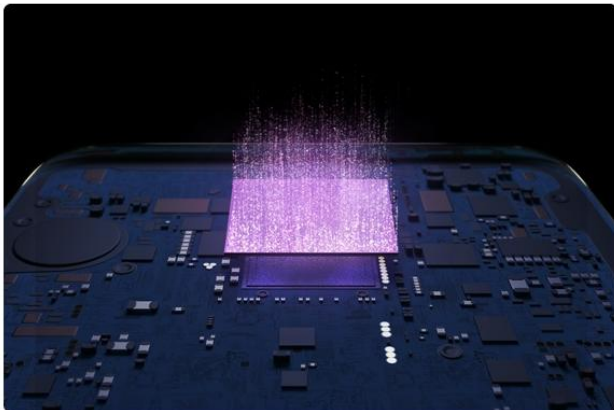
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																																																																										
	 The screenshot displays two panels of system information from the AIDA64 application. The left panel, titled 'AIDA64 / System', lists various hardware and software details for a Samsung Galaxy S23 Ultra (USA Unlocked). The right panel, titled 'AIDA64 / CPU', provides detailed information about the Qualcomm Snapdragon 8 Gen 2 (SM8550) processor, including its core architecture, manufacturing process, and clock speeds for each of the 8 cores. <table border="1"> <thead> <tr> <th>Category</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Device Model</td> <td>Samsung Galaxy S23 Ultra (USA Unlocked)</td> </tr> <tr> <td>Device Type</td> <td>Phablet</td> </tr> <tr> <td>Manufacturer</td> <td>samsung</td> </tr> <tr> <td>Model</td> <td>SM-S918U1</td> </tr> <tr> <td>Brand</td> <td>samsung</td> </tr> <tr> <td>Board</td> <td>kalama</td> </tr> <tr> <td>Device</td> <td>dm3q</td> </tr> <tr> <td>Hardware</td> <td>qcom</td> </tr> <tr> <td>Platform</td> <td>kalama</td> </tr> <tr> <td>Product</td> <td>dm3quew</td> </tr> <tr> <td>Installed RAM</td> <td>7 GB LPDDR5X</td> </tr> <tr> <td>Total Memory</td> <td>7056 MB</td> </tr> <tr> <td>Available Memory</td> <td>3078 MB</td> </tr> <tr> <td>Internal Storage Total Space</td> <td>223.12 GB</td> </tr> <tr> <td>Internal Storage Free Space</td> <td>204.03 GB</td> </tr> <tr> <td>Bluetooth Version</td> <td>5.3</td> </tr> <tr> <td>Device Features:</td> <td> - android.hardware.audio.low_latency - android.hardware.audio.output - android.hardware.audio.pro - android.hardware.biometrics.face - android.hardware.bluetooth - android.hardware.bluetooth_le - android.hardware.camera - android.hardware.camera.any - android.hardware.camera.autofocus </td> </tr> <tr> <td>SoC Model</td> <td>Qualcomm Snapdragon 8 Gen 2 (SM8550)</td> </tr> <tr> <td>Core Architecture</td> <td> 3x ARM Cortex-A510 @ 2016 MHz 2x ARM Cortex-A715 @ 2803 MHz 2x ARM Cortex-A710 @ 2803 MHz - ARM Cortex-X3 @ 3360 MHz </td> </tr> <tr> <td>Manufacturing Process</td> <td>4 nm</td> </tr> <tr> <td>Instruction Set</td> <td>64-bit ARMv9-A</td> </tr> <tr> <td>CPU Revision</td> <td>r1p0</td> </tr> <tr> <td>CPU Cores</td> <td>8</td> </tr> <tr> <td>CPU Clock Range</td> <td>307 - 3360 MHz</td> </tr> <tr> <td>Core 1 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 2 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 3 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 4 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 5 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 6 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 7 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 8 Clock</td> <td>864 MHz</td> </tr> <tr> <td>L3 Cache</td> <td>8 MB</td> </tr> <tr> <td>Scaling Governor</td> <td>walt</td> </tr> <tr> <td>Supported ABIs</td> <td>arm64-v8a, armeabi-v7a, armeabi</td> </tr> <tr> <td>Supported 32-bit</td> <td>armeabi-v7a, armeabi</td> </tr> </tbody> </table>	Category	Value	Device Model	Samsung Galaxy S23 Ultra (USA Unlocked)	Device Type	Phablet	Manufacturer	samsung	Model	SM-S918U1	Brand	samsung	Board	kalama	Device	dm3q	Hardware	qcom	Platform	kalama	Product	dm3quew	Installed RAM	7 GB LPDDR5X	Total Memory	7056 MB	Available Memory	3078 MB	Internal Storage Total Space	223.12 GB	Internal Storage Free Space	204.03 GB	Bluetooth Version	5.3	Device Features:	- android.hardware.audio.low_latency - android.hardware.audio.output - android.hardware.audio.pro - android.hardware.biometrics.face - android.hardware.bluetooth - android.hardware.bluetooth_le - android.hardware.camera - android.hardware.camera.any - android.hardware.camera.autofocus	SoC Model	Qualcomm Snapdragon 8 Gen 2 (SM8550)	Core Architecture	3x ARM Cortex-A510 @ 2016 MHz 2x ARM Cortex-A715 @ 2803 MHz 2x ARM Cortex-A710 @ 2803 MHz - ARM Cortex-X3 @ 3360 MHz	Manufacturing Process	4 nm	Instruction Set	64-bit ARMv9-A	CPU Revision	r1p0	CPU Cores	8	CPU Clock Range	307 - 3360 MHz	Core 1 Clock	672 MHz	Core 2 Clock	672 MHz	Core 3 Clock	672 MHz	Core 4 Clock	614 MHz	Core 5 Clock	614 MHz	Core 6 Clock	614 MHz	Core 7 Clock	614 MHz	Core 8 Clock	864 MHz	L3 Cache	8 MB	Scaling Governor	walt	Supported ABIs	arm64-v8a, armeabi-v7a, armeabi	Supported 32-bit	armeabi-v7a, armeabi
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Board	kalama																																																																										
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																		
	 Processor Qualcomm Snapdragon 8 Gen2 Mobile Platform for Galaxy <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 740</td></tr></table> Galaxy S23 Ultra technical specifications; https://www.samsung.com/us/smartphones/galaxy-s23-ultra/buy/galaxy-s23-ultra-512gb-verizon-sm-s918uzgfvzw/?modelCode=SM-S918UZGFXAU; https://www.gsmarena.com/samsung_galaxy_s23_ultra-12024.php.  Processor Snapdragon 8+ Gen 1 Up to 3.2GHz <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 12L, upgradable to Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 730</td></tr></table> Galaxy Z Fold4 technical specifications; https://www.samsung.com/us/smartphones/galaxy-z-fold4/buy/galaxy-z-fold4-512gb-att-sm-f936uzeeatt/; https://www.gsmarena.com/samsung_galaxy_z_fold4-11737.php.  Processor Snapdragon 8+ Gen 1 Up to 3.2GHz	PLATFORM	OS	Android 13, One UI 5.1	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)	GPU	Adreno 740	PLATFORM	OS	Android 12L, upgradable to Android 13, One UI 5.1	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)	GPU	Adreno 730
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	GPU	Mali-G68 MP5											
[1.b] a clock controller capable of changing a frequency of a clock signal to be fed to the processor;	Each of the Accused Samsung '417 Products includes a clock controller capable of changing a frequency of a clock signal to be fed to the processor. <i>See e.g.</i>, Technical Specifications of each of the Accused Samsung '417 Products available at Samsung's website showing that each of the Accused Samsung '417 Products includes an SoC chipset (<i>e.g.</i>, Snapdragon platform) that includes a clock controller capable of changing a frequency of a clock signal to be fed to the processor. (https://www.samsung.com/us/smartphones/). Enable 'Power saving' mode in your Galaxy smartphone When the battery is running low, enable 'Power saving' to extend battery life. Once 'Power saving' is enabled, background apps will be restricted from Wi-Fi and mobile data, and heavy battery-consuming features such as Always On Display will be disabled to extend battery life. You can select and adjust CPU speed, brightness level, and Always On Display to your preference. ※ When 'Power saving' mode is enabled, background data restrictions will apply to all apps and location services may also be limited. https://www.samsung.com/us/support/galaxy-battery/optimization/												

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Reduce power consumption with Light performance mode on your Galaxy device Last Update date : 2023-08-18 Light performance mode is a feature that enhances heat generation and battery usage by changing the processing speed to partially adjust it to improve battery consumption. When operating in Light performance mode, the device can use less performance power compared to normal mode with no impact to internet surfing, social media, phone calls or video playback.  https://www.samsung.com/ae/support/mobile-devices/how-to-use-galaxy-s23-light-mode/ (upon information and belief the same features exist in US models)

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Samsung Galaxy A20 - Manage Battery Saving Settings Power Saving mode helps extend battery life on your Galaxy A20 by reducing performance and limiting vibration, location services, and most background data. 1. Open the Settings app. 2. Navigate: Battery and device care › Battery › Power saving mode. 3. Tap the Power saving mode switch to turn on or off. 4. When turned off, you can customize power saving options by tapping the following to turn on or off: • Limit CPU speed to 70% • Decrease brightness by 10% • Limit apps and Home screen https://www.verizon.com/support/knowledge-base-308608/ Samsung Galaxy S23 Featuring Snapdragon 8 Gen 2 for Galaxy. Meet the Samsung Galaxy S23, the phone that takes you out of the everyday and into the epic. Powered by Snapdragon 8 Gen 2 for Galaxy, it delivers accelerated performance and unparalleled connectivity. Unlock epic experiences across AI, 5G, gaming, camera, and WiFi and Bluetooth thanks to Qualcomm FastConnect 6900. Life doesn't wait for the perfect lighting, but with Nightography, you are always ready to seize the moment even in low light and snap memories like a pro.

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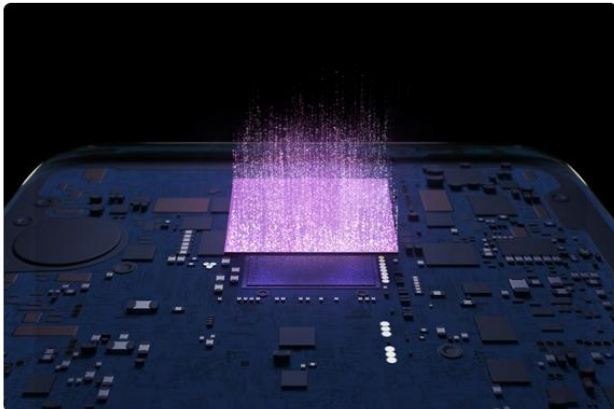
U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																						
	Qualcomm, https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s23 Processor <table><tr><td>CPU Type</td><td>CPU Speed</td></tr><tr><td>Octa-Core</td><td>3.36GHz,2.8GHz,2GHz</td></tr></table> OS OS Android https://www.samsung.com/us/smartphones/galaxy-s23/buy/galaxy-s23-plus-256gb-unlocked-sm-s916ulixaa/ <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, up to 4 major Android upgrades, One UI 6.1.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 740</td></tr></table> Samsung Galaxy S23 tech specs, https://www.gsmarena.com/samsung_galaxy_s23-12082.php  Processor Qualcomm Snapdragon 8 Gen2 Mobile Platform for Galaxy <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 740</td></tr></table> Galaxy S23 Ultra technical specifications; https://www.samsung.com/us/smartphones/galaxy-s23-ultra/buy/galaxy-s23-ultra-512gb-verizon-sm-s918uzgfvzw/?modelCode=SM-S918UZGFXAU; https://www.gsmarena.com/samsung_galaxy_s23_ultra-12024.php.	CPU Type	CPU Speed	Octa-Core	3.36GHz,2.8GHz,2GHz	PLATFORM	OS	Android 13, up to 4 major Android upgrades, One UI 6.1.1	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)	GPU	Adreno 740	PLATFORM	OS	Android 13, One UI 5.1	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)	GPU	Adreno 740
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Maxell, Ltd.

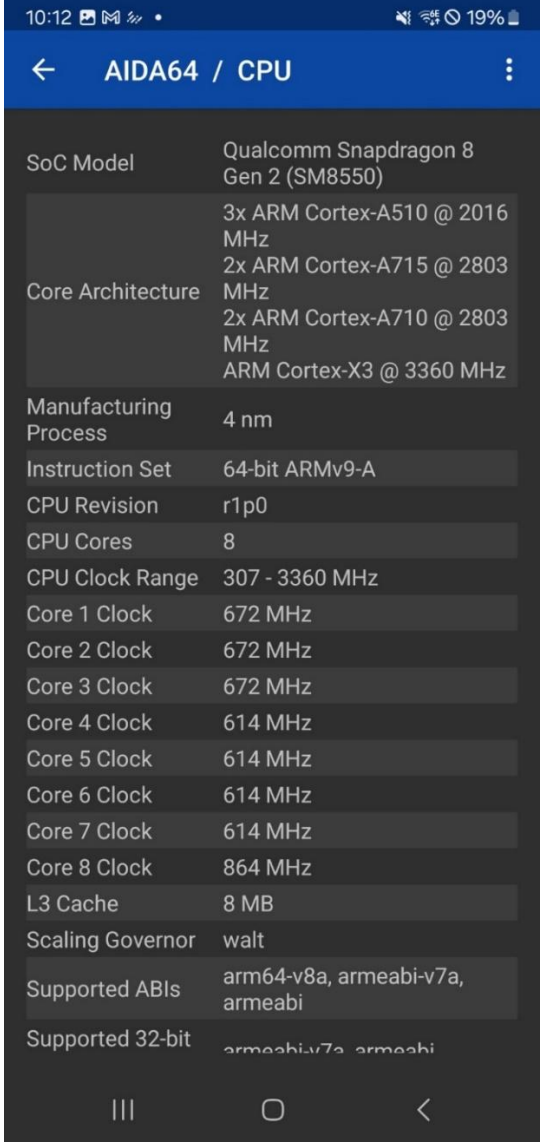
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PLATFORM	OS	Android 12, upgradable to Android 13, One UI 5.1																							
	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)																							
	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)																							
	GPU	Adreno 730																							
Processor																									
CPU Type	CPU Speed																								
Octa-Core	2.4GHz,2GHz																								

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement												
	Performance  * * * Impressive speed. Powerful processor The powerful Octa-core processor opens up a new range of possibilities with heightened performance and capacity. <table><tr><td>PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td></td><td>Chipset</td><td>Exynos 1380 (5 nm)</td></tr><tr><td></td><td>CPU</td><td>Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)</td></tr><tr><td></td><td>GPU</td><td>Mali-G68 MP5</td></tr></table> Galaxy A54 5G technical specifications; https://www.samsung.com/us/mobile/phones/galaxy-a/galaxy-a54-5g-128gb-verizon-sm-a546vzkbvzw/; https://www.gsmarena.com/samsung_galaxy_a54-12070.php Further, AIDA64 reports for Samsung products confirm that the Samsung products include a clock controller allowing the CPU to operate in varying frequencies: Samsung Galaxy S23	PLATFORM	OS	Android 13, One UI 5.1		Chipset	Exynos 1380 (5 nm)		CPU	Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)		GPU	Mali-G68 MP5
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																																								
	 The screenshot displays the AIDA64 / CPU interface for a Qualcomm Snapdragon 8 Gen 2 (SM8550) processor. The specifications listed are as follows: <table border="1"> <thead> <tr> <th>Category</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>SoC Model</td> <td>Qualcomm Snapdragon 8 Gen 2 (SM8550)</td> </tr> <tr> <td>Core Architecture</td> <td>3x ARM Cortex-A510 @ 2016 MHz 2x ARM Cortex-A715 @ 2803 MHz 2x ARM Cortex-A710 @ 2803 MHz ARM Cortex-X3 @ 3360 MHz</td> </tr> <tr> <td>Manufacturing Process</td> <td>4 nm</td> </tr> <tr> <td>Instruction Set</td> <td>64-bit ARMv9-A</td> </tr> <tr> <td>CPU Revision</td> <td>r1p0</td> </tr> <tr> <td>CPU Cores</td> <td>8</td> </tr> <tr> <td>CPU Clock Range</td> <td>307 - 3360 MHz</td> </tr> <tr> <td>Core 1 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 2 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 3 Clock</td> <td>672 MHz</td> </tr> <tr> <td>Core 4 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 5 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 6 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 7 Clock</td> <td>614 MHz</td> </tr> <tr> <td>Core 8 Clock</td> <td>864 MHz</td> </tr> <tr> <td>L3 Cache</td> <td>8 MB</td> </tr> <tr> <td>Scaling Governor</td> <td>walt</td> </tr> <tr> <td>Supported ABIs</td> <td>arm64-v8a, armeabi-v7a, armeabi</td> </tr> <tr> <td>Supported 32-bit</td> <td>armeabi-v7a, armeabi</td> </tr> </tbody> </table>	Category	Value	SoC Model	Qualcomm Snapdragon 8 Gen 2 (SM8550)	Core Architecture	3x ARM Cortex-A510 @ 2016 MHz 2x ARM Cortex-A715 @ 2803 MHz 2x ARM Cortex-A710 @ 2803 MHz ARM Cortex-X3 @ 3360 MHz	Manufacturing Process	4 nm	Instruction Set	64-bit ARMv9-A	CPU Revision	r1p0	CPU Cores	8	CPU Clock Range	307 - 3360 MHz	Core 1 Clock	672 MHz	Core 2 Clock	672 MHz	Core 3 Clock	672 MHz	Core 4 Clock	614 MHz	Core 5 Clock	614 MHz	Core 6 Clock	614 MHz	Core 7 Clock	614 MHz	Core 8 Clock	864 MHz	L3 Cache	8 MB	Scaling Governor	walt	Supported ABIs	arm64-v8a, armeabi-v7a, armeabi	Supported 32-bit	armeabi-v7a, armeabi
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Upon information and belief, the Accused Samsung '417 Products include a clock controller to implement power management techniques: Power Management Effective smartphone power management helps deliver a long lasting battery life and a cool skin temperature. The amount of power $\mathcal{P}$ a CPU draws is a function of voltage (v), frequency (f), and capacitance $\mathcal{C}$. (For more information about measuring and isolating SoC power, please refer to our initial post on best practices.) $P = v^2 \times f \times c$

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	However, <i>frequency and voltage are controllable</i> during runtime. At the CPU core level, dynamic clock and voltage scaling (DCVS) is a technique used to adjust the frequency and voltage of the power equation to deliver the needed performance at the ideal power level. Voltage is a significant and exponential (v^2) contributor to CPU power draw, so more power reductions are found here compared to a proportional drop in frequency. Voltage reductions have a limitation, because this impacts the on/off transition time of the transistor. If that rising/falling transition is delayed enough so that the propagation time of the signal does not arrive to the stage of the pipeline before the next clock transition, the instruction will fail. Frequency reductions do not contain the same design risks as modulating voltage, but there are performance impacts. Varying voltage and frequency to reduce CPU power draw has become even more of an industry challenge as modern smartphones contain multiple CPU cores. Qualcomm Snapdragon processors take DCVS a step-further with Asynchronous Multiprocessing (aSMP). Generally, designs from competitors use DCVS, but each core is forced to follow the other's frequency and voltage settings. The Krait CPU cores of Snapdragon processors lie on separate voltage and frequency planes. This allows each CPU core to hit independent frequencies and voltages, delivering scalable performance and power levels.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Performance Management The vast majority of the time, you want your smartphone to take advantage of power management features like DCVS and aSMP to deliver the best battery life possible. Other times to deliver a better user experience, you want all of the horsepower of the CPU unleashed and <i>not</i> to use battery saving features. For those situations, maximum performance is achieved through Qualcomm Technologies' Performance Mode. Performance Mode enables applications to change CPU parameters to deliver optimum performance. This includes locking the CPU frequency, requesting additional CPU cores, and setting the duration of these events. It is important to note that Performance Mode only impacts the CPU settings mentioned above. It does not allow overclocking of the CPU nor does it apply to the GPU, DSP, RAM, or other cores of the SoC. Finally, even when the battery saving features aren't enabled, thermal trips and thermal management are still engaged and protecting the SoC and smartphone. In other words, the thermal thresholds are still obeyed during this mode, staying true to the smartphone design. See https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu. For example, the Samsung Galaxy S23 is equipped with the Snapdragon 8 Gen 2 Mobile Platform, which features a CPU utilizing Kryo cores.

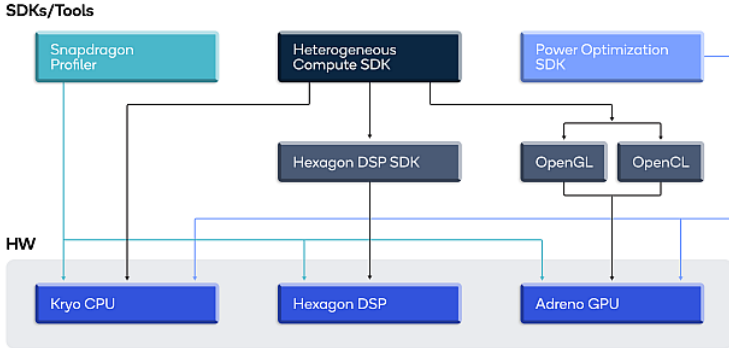
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	SNAPDRAGON® 8 GEN 2 MOBILE PLATFORM The Snapdragon 8 Gen 2 Mobile Platform defines a new premium standard for connected computing. Intelligently engineered with groundbreaking AI across the board, this AI marvel enables truly extraordinary experiences. A promotional graphic for the Snapdragon 8 Gen 2 Mobile Platform. It features a red background with a series of concentric squares. In the center is the Snapdragon 8 Gen 2 logo, which includes the word "Snapdragon" in red, a large "8" in yellow, and "Gen 2" in red below it, all set against a white background.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 CPU Kryo CPU • 64-bit Architecture • 1 Prime core, up to 3.36 GHz² • 4 Performance cores, up to 2.8 GHz • 3 Efficiency cores, up to 2.0 GHz https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/Snapdragon-8-Gen-2-Product-Brief.pdf Power management systems, using the Snapdragon Power Optimization SDK, adjust the frequency of the clock signal supplied to the Kryo CPU cores.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Tools from Qualcomm Technologies Out of our rich set of tools, developers can implement and optimize for heterogeneous computing and power efficiency through the following: • Snapdragon Heterogeneous Compute SDK: provides developers with the ability to allocate work to any of the three processors on Snapdragon. The SDK provides C++ API's for the Kryo CPU and Adreno GPU, the latter of which interacts through OpenGL and OpenCL calls. For the Hexagon DSP, developers should utilize the Hexagon DSP SDK. • Snapdragon Power Optimization SDK: provides C++ APIs for balancing processing performance and power efficiency on the Kryo CPU and the Adreno GPU. • Snapdragon Profiler: a standalone tool that connects with Android devices powered by Snapdragon processors over USB, and allows developers to analyze CPU, GPU, DSP, memory, power, thermal, and network data. While the Heterogeneous Compute SDK is primarily focused on heterogeneous computing (e.g., processor and core selection), it's often paired with the Power Optimization SDK to fulfill power efficiency requirements which typically go hand in hand with heterogeneous compute requirements. On top of this, developers should also use the Snapdragon profiler to monitor performance, power, and heat while integrating these SDKs. The following diagram summarizes these tools and their dependencies, and outlines the processors that each of these tool/SDKs interacts with:  https://www.qualcomm.com/news/onq/2020/03/developers-heterogeneous-computing-your-demanding-apps

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	See Snapdragon 8 Gen 2 Mobile Platform SDK Overview (Upon information and belief the Accused Samsung '417 Products includes similar clock management features for purposes of power management). Qualcomm® Kryo™ CPU Updated: Dec 09, 2024 80-78185-2 Rev: AH Overview Kryo CPUs are ARM-based big.LITTLE architecture. To optimize CPU utilization, we recommend looking at the Qualcomm Products and/or the Device Finder to identify the families of Kryo CPU chipsets you would like to target and which ARM Cortex CPU is it based on. For example, Qualcomm Snapdragon 865 has the Kryo 585 CPU which is based on the Cortex-A77. ARM has family specific software optimization guides that provide details on how to optimize applications for those CPUs. big.LITTLE Architecture The diagram illustrates the big.LITTLE architecture. It shows four 'big' cores, each represented by a red box labeled 'CPU' with a dotted border, and four 'little' cores, each represented by a smaller red box labeled 'CPU'. Below each 'big' core is a red box labeled 'L2', and below each 'little' core is a red box labeled 'L2'. These eight L2 caches are connected to a single, wider red box labeled 'L3 Cache'. This L3 Cache is then connected to a final, widest red box at the bottom labeled 'System Cache'. big.LITTLE architecture is composed of <i>big</i> cores which are optimized for performance and <i>little</i> cores optimized for power efficiency. Understanding this distinction and how to work with this architecture is crucial to optimizing performance and power efficiency, which translates to longer play sessions and a cooler thermal profile for the game. For additional information on big.LITTLE architecture visit https://www.arm.com/why-arm/technologies/big-little. To understand how to take advantage of thread placement on your game, refer to Threading and Core Affinity.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Threading and Core Affinity Task scheduling on Kryo CPUs is performed at the hardware level. This scheduling can be guided by the OS through platform APIs that allow game developers to provide "hints" to the system to balance power and performance. On Snapdragon platforms, these hints are provided via the Heterogeneous Compute SDK which, among other useful APIs, provides developers the ability to control task execution and map tasks to a desired core or core type. sched_setaffinity() from sched.h is another method of mapping threads to cores. Often intelligently mapping threads to the appropriate cores will outperform letting Android schedule any thread on any core. Little cores should be leveraged as much as possible. Given a frame budget of 16ms (60FPS) a developer can identify tasks using tools such as Snapdragon Profiler that would be good candidates to be moved to little cores. For example, a game with a cloth simulation solver that takes 3ms to execute on a big core may take 10ms on a little core. As long as this execution time is acceptable (which in this case it is because our budget is 16ms), this task can and should be moved to the little cores. This both conserves power (with less drain on the battery) and leaves faster cores for more processing-intensive threads. Another example: audio should usually be scheduled on a little core (the slowest), since such cores are usually more than fast enough for typical audio processing, particularly if that's the only functionality the game requests of that core. Prefer the biggest core for processing tasks that are sufficiently latency-sensitive to be too slow on the smaller cores – for example, the render thread should be scheduled on the fastest core for latency-minimization and maximizing frame pacing consistency; it's the core least likely to be interrupted, and will process most quickly.

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	Power considerations Another area to watch for is excessive or unnecessary wakeups of idle cores, which can result in more power consumption. One solution is to map tasks to the same core without overloading the core. Fortunately, runtimes for big.LITTLE platforms, such as those in Snapdragon mobile platforms, are engineered to employ three common task scheduling methods to help take care of such issues for you: • Core clustering: Cores of the same size are treated as one cluster. The most appropriate cluster is chosen based on system demands. This can be efficient if the whole cluster migrates to the big core. However, this is less optimal than the following two methods because the CPU frequency driver tells the OS kernel the required frequency and voltage • In-kernel switching or CPU migration: A big and a little core are paired into a virtual core in which only one of the two physical cores in that virtual core is used (which core depends on demand). This provides increased efficiency over core clustering, but requires that core capabilities are the same • Global task scheduling: All physical cores are available all of the time. The global task scheduler allocates tasks on a per-core basis depending on demands. This is the optimal method because the OS scheduler can allocate work on any core, all cores, or any combination, while unused cores are automatically turned off. This method does not require matching core configurations. It can react more quickly to load changes, and work can be allocated at a finer level of granularity than by the CPU frequency driver used in core clustering Developers also have the ability to control power modes on Snapdragon platforms via the Power Optimization SDK. This SDK allows developers to adjust the power mode based on the game or task use case and performance/power demands with the following modes: • Efficient mode: Achieves close-to-best performance with power savings • Performance burst mode: Supports all cores at the maximum frequency for a short duration of time. It is useful for bursts of intensive computation to gain performance • Saver mode: Provides around half of the peak performance of the system and helps when performance requirements of the application are small • Window mode: Allows for fine tuning of performance/power balance using arguments to set the minimum and maximum frequency percentages relative to the maximum frequency that cores can use • Normal mode: Returns system to its default state https://docs.qualcomm.com/bundle/publicresource/topics/80-78185-2/cpu.html See Snapdragon 8 Gen 2 Mobile Platform System Power Overview (Upon information and belief the Accused Samsung '417 Products includes similar clock management features for purposes of power management). <u>Doctrine of Equivalents</u> To the extent Samsung argues that this limitation is not literally met in any Accused Samsung '417 Products, Maxell asserts that this limitation is met under the doctrine of equivalents because the identified structure matches the function, way, and result of the claimed element and, to the extent there is a difference, the difference is insubstantial. For example, to the extent that Samsung argues that the Accused Samsung '417 Products do not include a clock controller, each of these products includes software, hardware, or a combination of the two that perform the equivalent function of changing a frequency of a clock signal to be fed to the processor. Using this software, hardware, or combination of the two, these products perform substantially the same function in

Maxell, Ltd.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	substantially the same way as claimed. For example, this would include controlling the clock signal to set the CPU to operate in different frequencies. The performance of this function achieves substantially the same result, for example, changing the frequency of the clock signal to provide power savings.
[1.c] wherein the clock controller controls the frequency of the clock signal so as to become a first frequency when the mobile terminal is in the open condition, and controls the frequency of the clock signal so as to become a second frequency lower than the first frequency when the mobile terminal is in the closed condition, and	Each of the Accused Samsung '417 Products includes a clock controller wherein the clock controller controls the frequency of the clock signal so as to become a first frequency when the mobile terminal is in the open condition, and controls the frequency of the clock signal so as to become a second frequency lower than the first frequency when the mobile terminal is in the closed condition. <i>See, e.g.</i>, Technical Specifications of each of the Accused Samsung '417 Products available at Samsung's website showing that each of the phones operates in an open condition and closed condition. (https://www.samsung.com/us/smartphones/). Enable 'Power saving' mode in your Galaxy smartphone When the battery is running low, enable 'Power saving' to extend battery life. Once 'Power saving' is enabled, background apps will be restricted from Wi-Fi and mobile data, and heavy battery-consuming features such as Always On Display will be disabled to extend battery life. You can select and adjust CPU speed, brightness level, and Always On Display to your preference. ※ When 'Power saving' mode is enabled, background data restrictions will apply to all apps and location services may also be limited. https://www.samsung.com/us/support/galaxy-battery/optimization/

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	Reduce power consumption with Light performance mode on your Galaxy device Last Update date : 2023-08-18 Light performance mode is a feature that enhances heat generation and battery usage by changing the processing speed to partially adjust it to improve battery consumption. When operating in Light performance mode, the device can use less performance power compared to normal mode with no impact to internet surfing, social media, phone calls or video playback.  https://www.samsung.com/ae/support/mobile-devices/how-to-use-galaxy-s23-light-mode/ (upon information and belief the same features exist in US models)

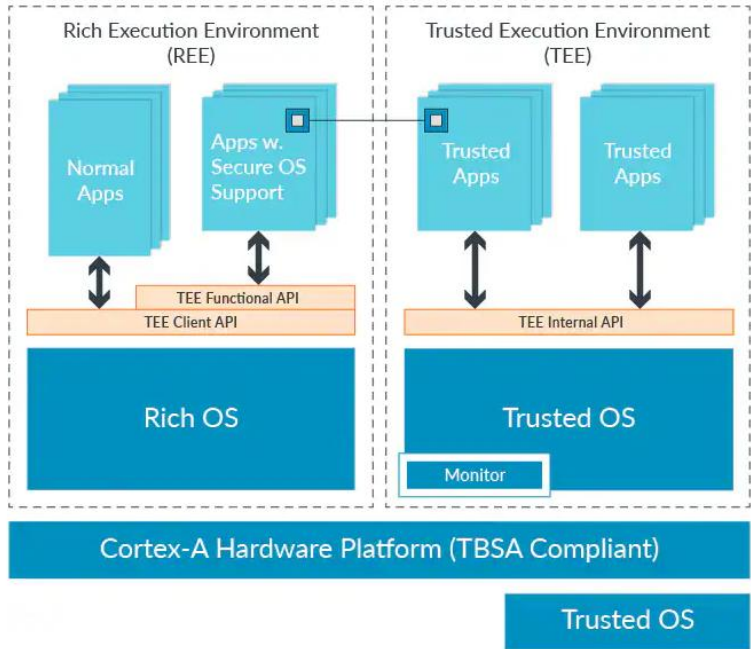
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Samsung Galaxy A20 - Manage Battery Saving Settings Power Saving mode helps extend battery life on your Galaxy A20 by reducing performance and limiting vibration, location services, and most background data. 1. Open the Settings app. 2. Navigate: Battery and device care › Battery › Power saving mode. 3. Tap the Power saving mode switch to turn on or off. 4. When turned off, you can customize power saving options by tapping the following to turn on or off: • Limit CPU speed to 70% • Decrease brightness by 10% • Limit apps and Home screen https://www.verizon.com/support/knowledge-base-308608/ For example, the Accused Samsung '417 Products is configured to switch between open condition and closed condition.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement		
	 (closed)	 (closed)	 (open) Samsung Galaxy S23 tech specs, http://samsung.com/us/smartphones/galaxy-s23/buy/galaxy-s23-plus-256gb-unlocked-sm-s916ulixaa/ For example, upon information and belief, the Accused Samsung '417 Products implement a Trusted Execution Environment (TEE) as secured/enforced/implemented by Samsung Knox to switch between closed and open conditions.

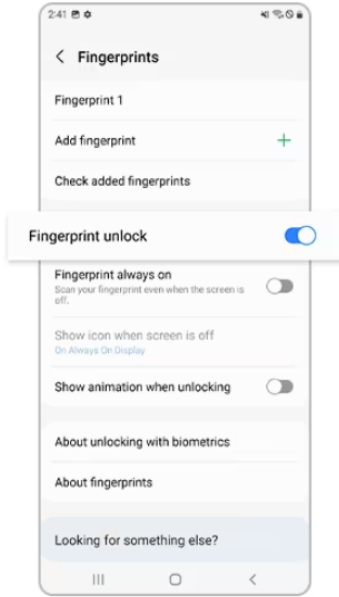
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	Development of TEE and Secure Monitor Code  The diagram illustrates the development of TEE and Secure Monitor Code. It shows two main execution environments: the Rich Execution Environment (REE) and the Trusted Execution Environment (TEE), both running on a Cortex-A Hardware Platform (TBSA Compliant). The REE contains Normal Apps and Apps w. Secure OS Support, which interact with the TEE Client API and TEE Functional API. The TEE contains Trusted Apps that interact with the TEE Internal API. A Monitor is shown within the Trusted OS layer, facilitating communication between the REE and TEE. The entire system is built upon a Rich OS and a Trusted OS. There are a wide variety of possible software architectures for the secure world, and the implementation of these is almost totally dependent on the application the user is targeting. A simple implementation may be focused on protecting a single asset which was implemented in a protected factory environment, such as authentication of a single secret. This requires a simple solution comprising of a lightweight secure kernel and integration of the monitor for switching between normal and secure domains. Alternatively the system architect may be looking for a robust and long term solution where trusted applications are appended over the lifetime of the device, for example in a mobile handset or tablet. In this case the designer may opt for a Trusted Execution Environment which mimics many of the dynamic functions of a traditional OS, including sandboxing of applications, while remaining small enough to be certified. Due to the inherent complexity of implementing a full Secure OS, and the potential need to certify its capabilities and performance, Arm recommends investigating commercial TEE solutions from Trusted OS suppliers that are members of GlobalPlatform. However if partners require a simpler solution, or are investigating building their own TEE, then we recommend they start by reviewing example code for the Secure Monitor. See https://www.arm.com/technologies/trustzone-for-cortex-a/tee-and-smc. Additional details regarding Arm TrustZone can be found in Trusted Base System Architecture for Armv8-A (document number DEN 0021F, issued 8/6/2020) available at

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	https://www.arm.com/technologies/trustzone-for-cortex-a. Exemplary screenshots from this document provided below: 7.10.1.3 Unlock operations To perform the state transition from "Closed" to "Open" an unlock operation must be performed by the debug protection mechanism to ensure that the external entity has access to a token that authorizes access to the associated assets. The token might take the form of a simple password or a cryptographically signed certificate. The choice between these often depends on the trade-off between complexity on the device and complexity on a token management server. For example, it is more complicated to implement signature checking on a device than to compare passwords, but managing a database of unique passwords is more complicated than one or two private keys on a server. To prevent the leak of an unlock token that affects multiple devices: <i>R100_TBSA_DEBUG Unlock tokens shall be unique for each device.</i> To ensure that the external entity knows which unlock token to use: <i>R110_TBSA_DEBUG The device shall store a unique ID in Public-Lockable fuses.</i> See also https://www.arm.com/technologies/trustzone-for-cortex-a/tee-and-smc; https://trusted-services.readthedocs.io/en/latest/overview/introduction.html; https://trusted-services.readthedocs.io/en/latest/developer/arch-overview.html How to use and set up fingerprint recognition to unlock the Galaxy S22 Series

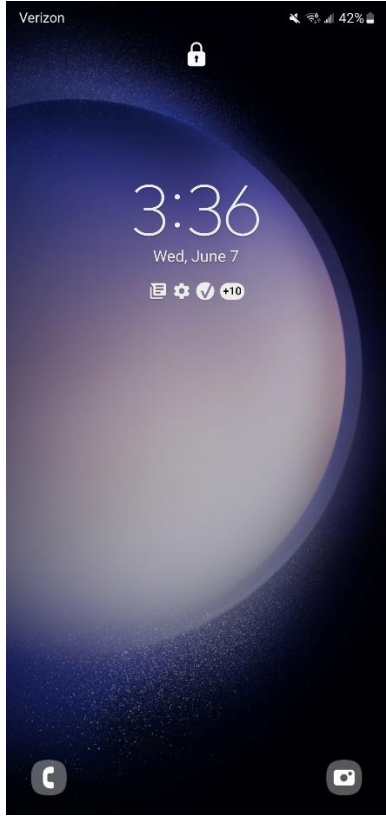
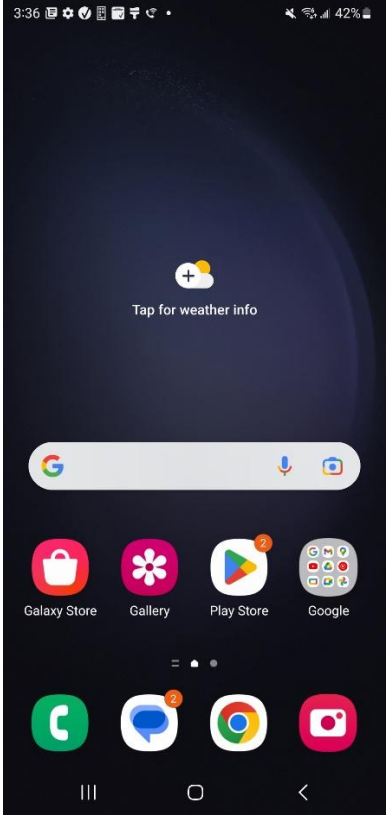
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Unlocking the screen with your fingerprints You can unlock the screen with your fingerprint instead of using a pattern, PIN, or password. Step 1. On the Settings screen, tap Biometrics and security > Fingerprints. Step 2. Unlock the screen using the preset screen lock method. Step 3. Tap the Fingerprint unlock switch to activate it. On the lock screen, place your finger on the fingerprint recognition sensor and scan your fingerprint. 

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	If fingerprint recognition is set but the PIN, Pattern, Password release screen appears ^ If you choose biometrics recognition, which includes using Fingerprints or Facial recognition to unlock your phone, the screen which requests your PIN, Pattern or Password may still appear instead of Fingerprints or Facial recognition in some cases according to the policy of Android OS. • If you have used and unlocked the device using Biometrics including Fingerprints or Facial recognition in the past 24 hours. • If 4 hours pass without an additional unlock operation after unlocking your device using Fingerprints or Facial recognition. • If 72 hours pass after unlocking your device using a PIN, Pattern or Password while fingerprint is set as screen lock type. This is an intended response for enhanced security of your device. Additionally, you can only use a PIN, Pattern or Password to unlock the screen after restarting the device or when you don't use the device for more than 24 hours. See https://www.samsung.com/levant/support/mobile-devices/how-to-use-and-set-up-fingerprint-recognition-to-unlock-the-galaxy-s22-series/

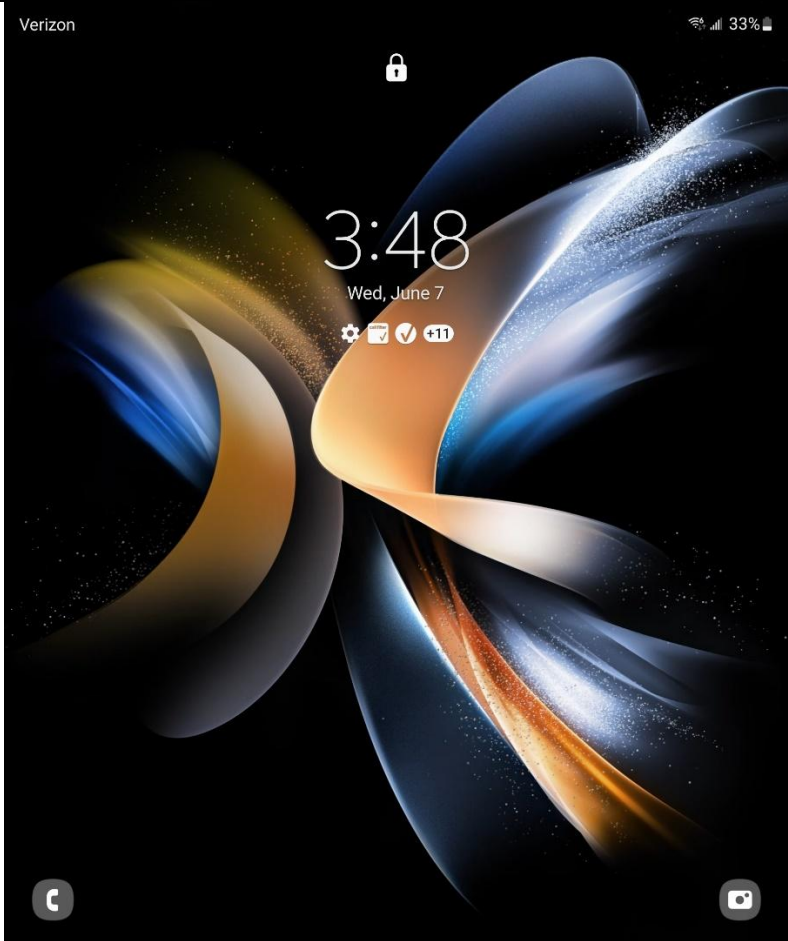
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	A screenshot of a Samsung Galaxy S23 Ultra lock screen. The status bar at the top shows 'Verizon' on the left and signal, Wi-Fi, and 42% battery icons on the right. The background is a dark blue space-themed wallpaper with a large planet. The time '3:36' is displayed in large white digits, with 'Wed, June 7' below it. At the bottom are icons for settings, a checkmark, and a battery level indicator. A screenshot of a Samsung Galaxy S23 Ultra home screen. The status bar at the top shows the time '3:36' and various notification icons. The background is a dark blue space-themed wallpaper. A 'Tap for weather info' prompt is centered. Below is a Google search bar. The dock at the bottom contains icons for Galaxy Store, Gallery, Play Store, Google, Phone, Messages, Chrome, and Camera.

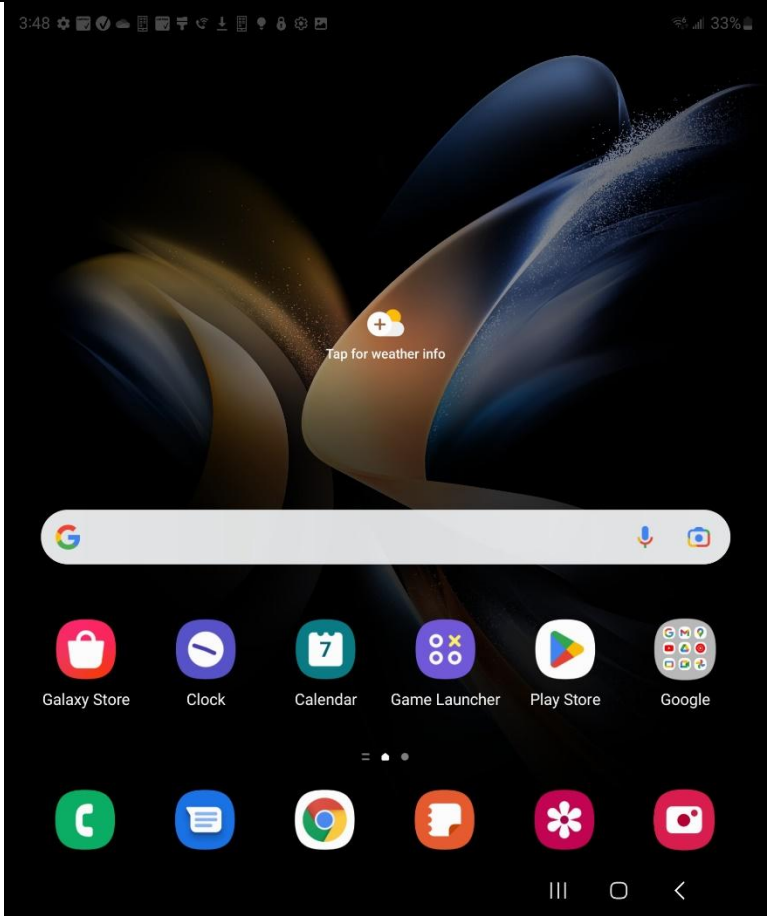
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Flip4 switching between closed and open conditions.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Galaxy Z Fold4 switching between closed and open conditions.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Galaxy A54 5G switching between closed and open conditions.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Unlocking the screen with your fingerprints You can unlock the screen with your fingerprint instead of using a pattern, PIN, or password. 1 On the Settings screen, tap Security and privacy → Biometrics → Fingerprints. 2 Unlock the screen using the preset screen lock method. 3 Tap the Fingerprint unlock switch to turn it on. 4 On the locked screen, place your finger on the fingerprint recognition sensor and scan your fingerprint. Changing the fingerprint recognition icon setting Set the device to show or hide the fingerprint recognition icon when you tap the screen while the screen is turned off. 1 On the Settings screen, tap Security and privacy → Biometrics → Fingerprints. 2 Unlock the screen using the preset screen lock method. 3 Tap Show icon when screen is off and select an option. See Galaxy S23 Series User Guide at pgs. 143-145. Further, upon information and belief, each of the Accused Samsung '417 Products includes a CPU that can operate in multiple frequencies: Samsung Galaxy S23 Featuring Snapdragon 8 Gen 2 for Galaxy. Meet the Samsung Galaxy S23, the phone that takes you out of the everyday and into the epic. Powered by Snapdragon 8 Gen 2 for Galaxy, it delivers accelerated performance and unparalleled connectivity. Unlock epic experiences across AI, 5G, gaming, camera, and WiFi and Bluetooth thanks to Qualcomm FastConnect 6900. Life doesn't wait for the perfect lighting, but with Nightography, you are always ready to seize the moment even in low light and snap memories like a pro. Qualcomm, https://www.qualcomm.com/snapdragon/device-finder/samsung-galaxy-s23

Maxell, Ltd.

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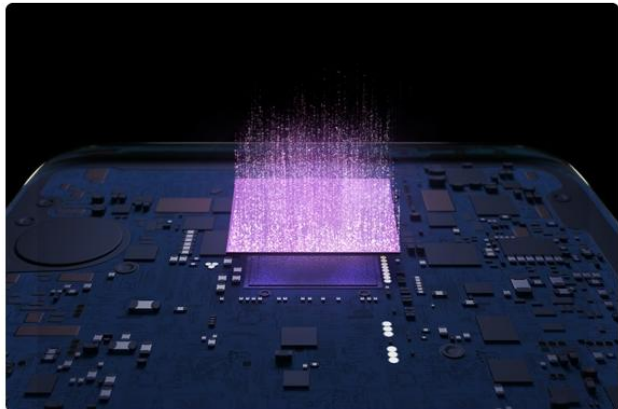
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																		
	Processor CPU Type CPU Speed Octa-Core 3.36GHz,2.8GHz,2GHz OS OS Android https://www.samsung.com/us/smartphones/galaxy-s23/buy/galaxy-s23-plus-256gb-unlocked-sm-s916ulixaa/ <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, up to 4 major Android upgrades, One UI 6.1.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 740</td></tr></table> Samsung Galaxy S23 tech specs, https://www.gsmarena.com/samsung_galaxy_s23-12082.php  Processor Qualcomm Snapdragon 8 Gen2 Mobile Platform for Galaxy <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 740</td></tr></table> Galaxy S23 Ultra technical specifications; https://www.samsung.com/us/smartphones/galaxy-s23-ultra/buy/galaxy-s23-ultra-512gb-verizon-sm-s918uzgfvzw/?modelCode=SM-S918UZGFXAU; https://www.gsmarena.com/samsung_galaxy_s23_ultra-12024.php.	PLATFORM	OS	Android 13, up to 4 major Android upgrades, One UI 6.1.1	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)	GPU	Adreno 740	PLATFORM	OS	Android 13, One UI 5.1	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)	GPU	Adreno 740
PLATFORM	OS		Android 13, up to 4 major Android upgrades, One UI 6.1.1																
	Chipset		Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)																
	CPU		Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)																
	GPU	Adreno 740																	
PLATFORM	OS	Android 13, One UI 5.1																	
	Chipset	Qualcomm SM8550-AC Snapdragon 8 Gen 2 (4 nm)																	
	CPU	Octa-core (1x3.36 GHz Cortex-X3 & 2x2.8 GHz Cortex-A715 & 2x2.8 GHz Cortex-A710 & 3x2.0 GHz Cortex-A510)																	
	GPU	Adreno 740																	

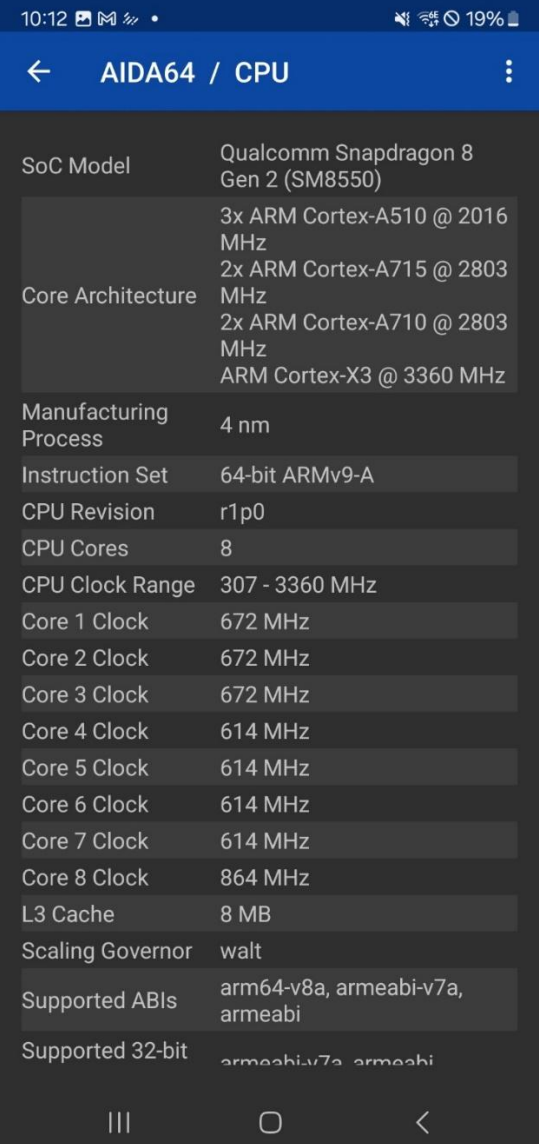
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement																								
	 Processor Snapdragon 8+ Gen 1 Up to 3.2GHz <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 12L, upgradable to Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 730</td></tr></table> Galaxy Z Fold4 technical specifications; https://www.samsung.com/us/smartphones/galaxy-z-fold4/buy/galaxy-z-fold4-512gb-att-sm-f936uzeeatt/; https://www.gsmarena.com/samsung_galaxy_z_fold4-11737.php.  Processor Snapdragon 8+ Gen 1 Up to 3.2GHz <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 12, upgradable to Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)</td></tr><tr><td>CPU</td><td>Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)</td></tr><tr><td>GPU</td><td>Adreno 730</td></tr></table> Galaxy Z Flip4 technical specifications; https://www.samsung.com/us/smartphones/galaxy-z-flip4/buy/galaxy-z-flip4-256gb-t-mobile-sm-f721uzdexau/; https://www.gsmarena.com/samsung_galaxy_z_flip4-11538.php. <table><tr><td>Processor</td><td></td></tr><tr><td>CPU Type</td><td>CPU Speed</td></tr><tr><td>Octa-Core</td><td>2.4GHz,2GHz</td></tr></table>	PLATFORM	OS	Android 12L, upgradable to Android 13, One UI 5.1	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)	GPU	Adreno 730	PLATFORM	OS	Android 12, upgradable to Android 13, One UI 5.1	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)	GPU	Adreno 730	Processor		CPU Type	CPU Speed	Octa-Core	2.4GHz,2GHz
PLATFORM	OS		Android 12L, upgradable to Android 13, One UI 5.1																						
	Chipset		Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)																						
	CPU		Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)																						
	GPU	Adreno 730																							
PLATFORM	OS	Android 12, upgradable to Android 13, One UI 5.1																							
	Chipset	Qualcomm SM8475 Snapdragon 8+ Gen 1 (4 nm)																							
	CPU	Octa-core (1x3.19 GHz Cortex-X2 & 3x2.75 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510)																							
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement									
	Performance  • • • Impressive speed. Powerful processor The powerful Octa-core processor opens up a new range of possibilities with heightened performance and capacity. <table><tr><td rowspan="4">PLATFORM</td><td>OS</td><td>Android 13, One UI 5.1</td></tr><tr><td>Chipset</td><td>Exynos 1380 (5 nm)</td></tr><tr><td>CPU</td><td>Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)</td></tr><tr><td>GPU</td><td>Mali-G68 MP5</td></tr></table> Galaxy A54 5G technical specifications; https://www.samsung.com/us/mobile/phones/galaxy-a/galaxy-a54-5g-128gb-verizon-sm-a546vzkbvzw/; https://www.gsmarena.com/samsung_galaxy_a54-12070.php Further, AIDA64 reports for Samsung products confirm that the Samsung products include a clock controller allowing the CPU to operate in varying frequencies: Samsung Galaxy S23	PLATFORM	OS	Android 13, One UI 5.1	Chipset	Exynos 1380 (5 nm)	CPU	Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)	GPU	Mali-G68 MP5
PLATFORM	OS		Android 13, One UI 5.1							
	Chipset		Exynos 1380 (5 nm)							
	CPU		Octa-core (4x2.4 GHz Cortex-A78 & 4x2.0 GHz Cortex-A55)							
	GPU	Mali-G68 MP5								

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 10:12 100% 19% ← AIDA64 / CPU ⋮ SoC Model Qualcomm Snapdragon 8 Gen 2 (SM8550) Core Architecture 3x ARM Cortex-A510 @ 2016 MHz 2x ARM Cortex-A715 @ 2803 MHz 2x ARM Cortex-A710 @ 2803 MHz ARM Cortex-X3 @ 3360 MHz Manufacturing Process 4 nm Instruction Set 64-bit ARMv9-A CPU Revision r1p0 CPU Cores 8 CPU Clock Range 307 - 3360 MHz Core 1 Clock 672 MHz Core 2 Clock 672 MHz Core 3 Clock 672 MHz Core 4 Clock 614 MHz Core 5 Clock 614 MHz Core 6 Clock 614 MHz Core 7 Clock 614 MHz Core 8 Clock 864 MHz L3 Cache 8 MB Scaling Governor walt Supported ABIs arm64-v8a, armeabi-v7a, armeabi Supported 32-bit armeabi-v7a, armeabi III ○ <

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Further, upon information and belief, each of the Accused Samsung '417 Products operates in a first frequency in open condition (when the products are unlocked and performing different processes for all the opened applications and providing power to the display) which is higher than a second frequency that is used in closed condition (when the products are locked). Upon information and belief the second frequency is lower than the first frequency because the devices are in a standby mode, the applications on the home screen are not executing, and the display is off or dimmed in the locked state. The reduction of clock frequency ensures better battery performance. Power Management Effective smartphone power management helps deliver a long lasting battery life and a cool skin temperature. The amount of power P a CPU draws is a function of voltage (v), frequency (f), and capacitance C. (For more information about measuring and isolating SoC power, please refer to our initial post on best practices.) $P = v^2 \times f \times c$

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	However, <i>frequency and voltage are controllable</i> during runtime. At the CPU core level, dynamic clock and voltage scaling (DCVS) is a technique used to adjust the frequency and voltage of the power equation to deliver the needed performance at the ideal power level. Voltage is a significant and exponential (v^2) contributor to CPU power draw, so more power reductions are found here compared to a proportional drop in frequency. Voltage reductions have a limitation, because this impacts the on/off transition time of the transistor. If that rising/falling transition is delayed enough so that the propagation time of the signal does not arrive to the stage of the pipeline before the next clock transition, the instruction will fail. Frequency reductions do not contain the same design risks as modulating voltage, but there are performance impacts. Varying voltage and frequency to reduce CPU power draw has become even more of an industry challenge as modern smartphones contain multiple CPU cores. Qualcomm Snapdragon processors take DCVS a step-further with Asynchronous Multiprocessing (aSMP). Generally, designs from competitors use DCVS, but each core is forced to follow the other's frequency and voltage settings. The Krait CPU cores of Snapdragon processors lie on separate voltage and frequency planes. This allows each CPU core to hit independent frequencies and voltages, delivering scalable performance and power levels.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Performance Management The vast majority of the time, you want your smartphone to take advantage of power management features like DCVS and aSMP to deliver the best battery life possible. Other times to deliver a better user experience, you want all of the horsepower of the CPU unleashed and <i>not</i> to use battery saving features. For those situations, maximum performance is achieved through Qualcomm Technologies' Performance Mode. Performance Mode enables applications to change CPU parameters to deliver optimum performance. This includes locking the CPU frequency, requesting additional CPU cores, and setting the duration of these events. It is important to note that Performance Mode only impacts the CPU settings mentioned above. It does not allow overclocking of the CPU nor does it apply to the GPU, DSP, RAM, or other cores of the SoC. Finally, even when the battery saving features aren't enabled, thermal trips and thermal management are still engaged and protecting the SoC and smartphone. In other words, the thermal thresholds are still obeyed during this mode, staying true to the smartphone design. See https://www.qualcomm.com/news/onq/2013/10/25/power-vs-performance-management-cpu. For example, the Samsung Galaxy S23 is equipped with the Snapdragon 8 Gen 2 Mobile Platform, which features a CPU utilizing Kryo cores.

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NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS**

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	SNAPDRAGON® 8 GEN 2 MOBILE PLATFORM The Snapdragon 8 Gen 2 Mobile Platform defines a new premium standard for connected computing. Intelligently engineered with groundbreaking AI across the board, this AI marvel enables truly extraordinary experiences. A promotional graphic for the Snapdragon 8 Gen 2 Mobile Platform. It features a red background with a series of concentric squares. In the center is a yellow square containing the Snapdragon logo, which includes the word "Snapdragon" in red, a large red "8", and "Gen 2" in red below it.

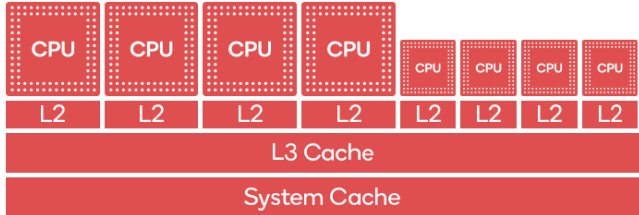
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	CPU Kryo CPU • 64-bit Architecture • 1 Prime core, up to 3.36 GHz² • 4 Performance cores, up to 2.8 GHz • 3 Efficiency cores, up to 2.0 GHz https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/Snapdragon-8-Gen-2-Product-Brief.pdf Power management systems, using the Snapdragon Power Optimization SDK, adjust the frequency of the clock signal supplied to the Kryo CPU cores.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Tools from Qualcomm Technologies Out of our rich set of tools, developers can implement and optimize for heterogeneous computing and power efficiency through the following: • Snapdragon Heterogeneous Compute SDK: provides developers with the ability to allocate work to any of the three processors on Snapdragon. The SDK provides C++ API's for the Kryo CPU and Adreno GPU, the latter of which interacts through OpenGL and OpenCL calls. For the Hexagon DSP, developers should utilize the Hexagon DSP SDK. • Snapdragon Power Optimization SDK: provides C++ APIs for balancing processing performance and power efficiency on the Kryo CPU and the Adreno GPU. • Snapdragon Profiler: a standalone tool that connects with Android devices powered by Snapdragon processors over USB, and allows developers to analyze CPU, GPU, DSP, memory, power, thermal, and network data. While the Heterogeneous Compute SDK is primarily focused on heterogeneous computing (e.g., processor and core selection), it's often paired with the Power Optimization SDK to fulfill power efficiency requirements which typically go hand in hand with heterogeneous compute requirements. On top of this, developers should also use the Snapdragon profiler to monitor performance, power, and heat while integrating these SDKs. The following diagram summarizes these tools and their dependencies, and outlines the processors that each of these tool/SDKs interacts with: <pre>graph TD subgraph SDKs_Tools [SDKs/Tools] direction TB SP[Snapdragon Profiler] HCS[Heterogeneous Compute SDK] POS[Power Optimization SDK] HDS[Hexagon DSP SDK] subgraph GL [] direction LR OGL[OpenGL] OCL[OpenCL] end end subgraph HW [HW] direction TB K[Kryo CPU] HD[Hexagon DSP] AG[Adreno GPU] end SP --> K SP --> HD SP --> AG HCS --> K HCS --> AG POS --> K POS --> AG HDS --> HD OGL --> AG OCL --> AG</pre>

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	https://www.qualcomm.com/news/onq/2020/03/developers-heterogeneous-computing-your-demanding-apps See Snapdragon 8 Gen 2 Mobile Platform System SDK Overview (Upon information and belief the Accused Samsung '417 Products includes similar clock management features for purposes of power management). Qualcomm® Kryo™ CPU Updated: Dec 09, 2024 80-78185-2 Rev: AH Overview Kryo CPUs are ARM-based big.LITTLE architecture. To optimize CPU utilization, we recommend looking at the Qualcomm Products and/or the Device Finder to identify the families of Kryo CPU chipsets you would like to target and which ARM Cortex CPU is it based on. For example, Qualcomm Snapdragon 865 has the Kryo 585 CPU which is based on the Cortex-A77. ARM has family specific software optimization guides that provide details on how to optimize applications for those CPUs. big.LITTLE Architecture  The diagram illustrates the big.LITTLE architecture. It shows four large red squares, each labeled 'CPU' and 'L2', representing 'big' cores. Next to them are four smaller red squares, also labeled 'CPU' and 'L2', representing 'little' cores. All eight of these core blocks are connected to a single horizontal bar labeled 'L3 Cache'. This L3 Cache is then connected to a final horizontal bar at the bottom labeled 'System Cache'. big.LITTLE architecture is composed of <i>big</i> cores which are optimized for performance and <i>little</i> cores optimized for power efficiency. Understanding this distinction and how to work with this architecture is crucial to optimizing performance and power efficiency, which translates to longer play sessions and a cooler thermal profile for the game. For additional information on big.LITTLE architecture visit https://www.arm.com/why-arm/technologies/big-little. To understand how to take advantage of thread placement on your game, refer to Threading and Core Affinity.

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	Threading and Core Affinity Task scheduling on Kryo CPUs is performed at the hardware level. This scheduling can be guided by the OS through platform APIs that allow game developers to provide "hints" to the system to balance power and performance. On Snapdragon platforms, these hints are provided via the Heterogeneous Compute SDK which, among other useful APIs, provides developers the ability to control task execution and map tasks to a desired core or core type. sched_setaffinity() from sched.h is another method of mapping threads to cores. Often intelligently mapping threads to the appropriate cores will outperform letting Android schedule any thread on any core. Little cores should be leveraged as much as possible. Given a frame budget of 16ms (60FPS) a developer can identify tasks using tools such as Snapdragon Profiler that would be good candidates to be moved to little cores. For example, a game with a cloth simulation solver that takes 3ms to execute on a big core may take 10ms on a little core. As long as this execution time is acceptable (which in this case it is because our budget is 16ms), this task can and should be moved to the little cores. This both conserves power (with less drain on the battery) and leaves faster cores for more processing-intensive threads. Another example: audio should usually be scheduled on a little core (the slowest), since such cores are usually more than fast enough for typical audio processing, particularly if that's the only functionality the game requests of that core. Prefer the biggest core for processing tasks that are sufficiently latency-sensitive to be too slow on the smaller cores – for example, the render thread should be scheduled on the fastest core for latency-minimization and maximizing frame pacing consistency; it's the core least likely to be interrupted, and will process most quickly.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Power considerations Another area to watch for is excessive or unnecessary wakeups of idle cores, which can result in more power consumption. One solution is to map tasks to the same core without overloading the core. Fortunately, runtimes for big.LITTLE platforms, such as those in Snapdragon mobile platforms, are engineered to employ three common task scheduling methods to help take care of such issues for you: • Core clustering: Cores of the same size are treated as one cluster. The most appropriate cluster is chosen based on system demands. This can be efficient if the whole cluster migrates to the big core. However, this is less optimal than the following two methods because the CPU frequency driver tells the OS kernel the required frequency and voltage • In-kernel switching or CPU migration: A big and a little core are paired into a virtual core in which only one of the two physical cores in that virtual core is used (which core depends on demand). This provides increased efficiency over core clustering, but requires that core capabilities are the same • Global task scheduling: All physical cores are available all of the time. The global task scheduler allocates tasks on a per-core basis depending on demands. This is the optimal method because the OS scheduler can allocate work on any core, all cores, or any combination, while unused cores are automatically turned off. This method does not require matching core configurations. It can react more quickly to load changes, and work can be allocated at a finer level of granularity than by the CPU frequency driver used in core clustering Developers also have the ability to control power modes on Snapdragon platforms via the Power Optimization SDK. This SDK allows developers to adjust the power mode based on the game or task use case and performance/power demands with the following modes: • Efficient mode: Achieves close-to-best performance with power savings • Performance burst mode: Supports all cores at the maximum frequency for a short duration of time. It is useful for bursts of intensive computation to gain performance • Saver mode: Provides around half of the peak performance of the system and helps when performance requirements of the application are small • Window mode: Allows for fine tuning of performance/power balance using arguments to set the minimum and maximum frequency percentages relative to the maximum frequency that cores can use • Normal mode: Returns system to its default state https://docs.qualcomm.com/bundle/publicresource/topics/80-78185-2/cpu.html See Snapdragon 8 Gen 2 Mobile Platform System Power Overview (Upon information and belief the Accused Samsung '417 Products includes similar clock management features for purposes of power management).
[1.d] wherein the clock controller controls the frequency of the clock signal so as to become a frequency higher than the second frequency when a specific processing is executed even if the mobile terminal is in the closed condition, and controls the frequency of the clock signal so as to become the second	Each of the Accused Samsung '417 Products include a clock controller wherein the clock controller controls the frequency of the clock signal so as to become a frequency higher than the second frequency when a specific processing is executed even if the mobile terminal is in the closed condition, and controls the frequency of the clock signal so as to become the second frequency after the execution of the specific processing is completed. For example, each of the Accused Samsung '417 Products executes a variety of specific processing in closed condition including, for example, accessing a camera application to capture a photo while locked and/or answering an incoming phone call. This includes, for example, asking

Maxell, Ltd.

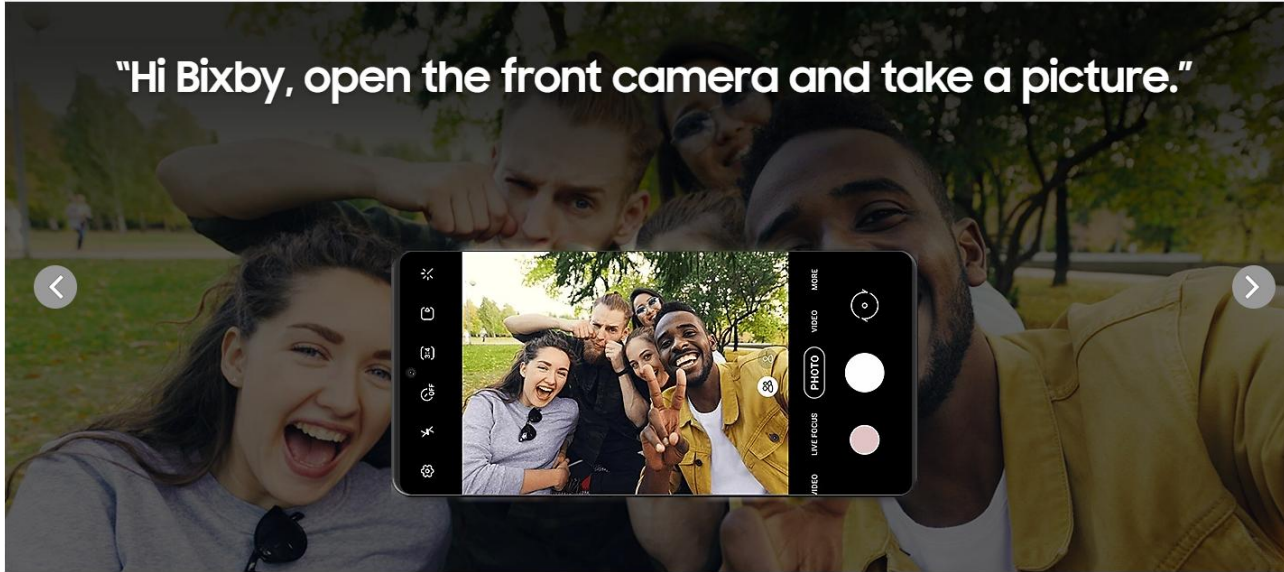
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
frequency after the execution of the specific processing is completed.	Bixby to take a picture or selfie, which would require providing processing power to the CPU and additional components (e.g., camera and audio interfaces). Exemplary screenshots showing examples of specific processing on the Samsung Galaxy S23 are shown below:  Samsung Galaxy S23 performing specific processing while closed by accessing a camera application and capturing a photo, and then returning to closed state after specific processing is performed.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Do more with Bixby Bixby gives you the freedom to focus on what matters most. It learns what you like to do and works with your favorite apps and services to help you get more things done.  "Hi Bixby, take a selfie." https://www.samsung.com/us/apps/bixby/

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	"Hi Bixby, open the front camera and take a picture."  <i>Id.</i>

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. ○ From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Settings Zoom Shooting modes Gallery Capture Switch cameras Galaxy S23 Ultra technical specification; https://downloadcenter.samsung.com/content/UM/202302/20230228053129621/SAM_S911_S916_S918_EN_UM_OS13_020223_FINAL_AC_022023.pdf at 58.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. ○ From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Expert RAW: Download the Expert RAW shooting mode. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. <i>Id.</i> at 59–60.

**APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT
NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS**

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. <i>Id.</i> at 74; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ○ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ○ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. <i>Id.</i> at 41.

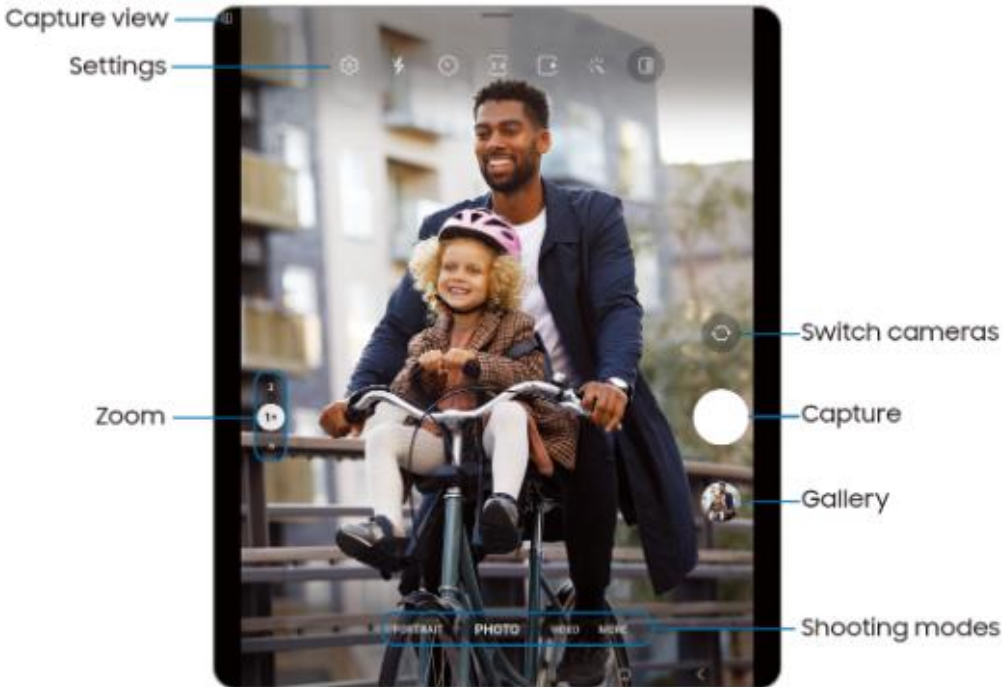
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Introduction Bixby is a user interface that helps you use your device more conveniently. You can talk to Bixby or type text. Bixby will launch a feature you request or show the information you want. Visit www.samsung.com/bixby for more information.  Bixby is only available in some languages, and it may not be available depending on the region. Starting Bixby Press and hold the Side key to launch Bixby. The Bixby intro page will appear. After you select the language to use with Bixby, sign in to your Samsung account, and complete the setup by following the on-screen instructions, the Bixby screen will appear. Using Bixby While pressing and holding the Side key, say what you want to Bixby. Alternatively, say the wake-up phrase and say what you want. For example, while pressing and holding the Side key, say “How’s the weather today?” The weather information will appear on the screen. If Bixby asks you a question during a conversation, you can continue to talk to Bixby without pressing the Side key or tapping . Waking up Bixby using your voice You can start a conversation with Bixby by saying “Hi, Bixby” or “Bixby”. Register your voice so that Bixby will respond to your voice. 1 Open the Bixby app and tap  → Voice wake-up. 2 Tap the switch to turn it on. 3 Select a wake-up phrase you want under Wake-up phrase. 4 Tap the Respond to my voice switch to turn it on. 5 Follow the on-screen instructions to complete the setup. Now you can say the wake-up phrase and start a conversation.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Communicating by typing text If your voice is not recognized because of noisy environments or if you are in a situation where speaking is difficult, you can communicate with Bixby through text. Open the Bixby app, tap , and then type what you want. During the communication, Bixby also will answer you through text instead of voice feedback. Bixby Vision Introduction Bixby Vision is a service that provides various features based on image recognition. You can use Bixby Vision to search for information by recognizing objects.  • This feature may not be available or you might not get correct search results depending on the image size, format, or resolution. • Samsung is not responsible for the product information provided by Bixby Vision. Launching Bixby Vision Launch Bixby Vision using one of these methods. • In the Camera app, tap MORE on the shooting modes list and tap BIXBY VISION. • In the Gallery app, select an image and tap . • In the Samsung Internet app, touch and hold an image and tap Search with Bixby Vision. • If you added the Bixby Vision app icon to the Apps screen, open the Bixby Vision app. Using Bixby Vision 1 Launch Bixby Vision. 2 Select a feature you want to use. • TRANSLATE: Recognize text from documents or images and translate it. • TEXT: Recognize text from documents or images and extract it. • DISCOVER: Search for images similar to the recognized object online and related information.  The available features and search results may vary depending on the region or carrier. Galaxy S23 Series User Guide at pg. 88-90.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Fold4 Camera features  Capture and view View the pictures and videos you capture while still using your camera. Images will be shown on the side panel until the Camera app is closed. This feature is only available when the device is open. From  Camera, tap  Capture View. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_fold4_camera_features_d1e3185.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. ◦ From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. Galaxy Z Fold4 technical specification; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/configure_shooting_mode_d1e3233.html.

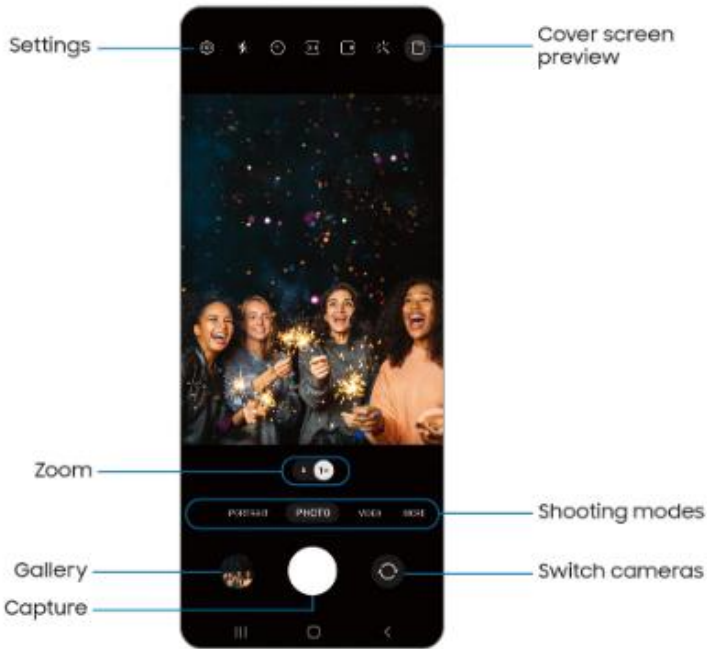
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	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/samsung_apps_d1e4429.html#d1e4524; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ◦ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ◦ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/bixby_d1e1993.html#d1e2011.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Flip4 Camera features  The image shows the camera app interface on a Galaxy Z Flip4. Labels point to the following features: 'Settings' (top left icon), 'Cover screen preview' (top right icon), 'Zoom' (middle slider), 'Shooting modes' (bottom row: PORTRAIT, PHOTO, VIDEO, MORE), 'Switch cameras' (bottom right icon), 'Gallery' (bottom left icon), and 'Capture' (bottom center shutter button). Selfies in Flex mode Use your camera in Flex mode for hands-free selfies. 1. Place your phone on a flat surface in table top view. 2. From  Camera, tap Portrait. 3. Tap  or  to move the camera preview to the top or bottom half of the screen. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_flip4_camera_features_d1e3206.html.

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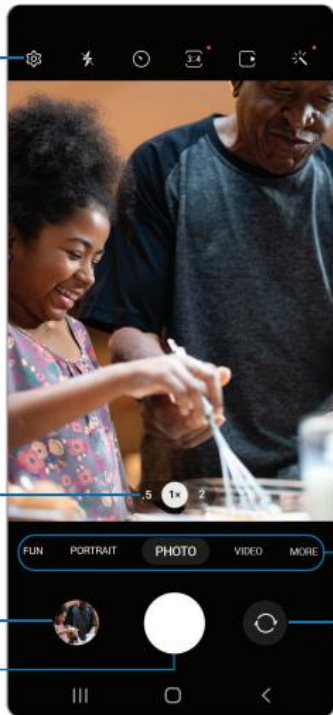
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Galaxy A54 5G technical specifications; https://downloadcenter.samsung.com/content/UM/202304/20230407022332214/SAM_A546_EN_UM_OS13_040523_FINAL.pdf at 40.

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APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Upon information and belief, the CPU would required additional processing power than compared to the closed condition when none of these processes are being performed. Thus, the CPU would operated at a frequency greater than the second frequency to perform these specific processes and the clock controller would enable operation in this additional frequency. For example, the CPU would include to operate at a greater frequency to drive the image components such as the ISP, GPU, image sensors, and/or memory. Further, once the processing will be complete, the Accused Samsung '417 Product would return to the closed condition when none of these processes are being performed and resume operating on the second frequency. The following documents provide evidence that the CPU speed/frequency is configurable and adjusted dynamically based on processing tasks so as to become a frequency higher than the second frequency when a specific processing is executed even if the mobile terminal is in the closed condition, and controls the frequency of the clock signal so as to become the second frequency after the execution of the specific processing is completed. Enable 'Power saving' mode in your Galaxy smartphone When the battery is running low, enable 'Power saving' to extend battery life. Once 'Power saving' is enabled, background apps will be restricted from Wi-Fi and mobile data, and heavy battery-consuming features such as Always On Display will be disabled to extend battery life. You can select and adjust CPU speed, brightness level, and Always On Display to your preference. ※ When 'Power saving' mode is enabled, background data restrictions will apply to all apps and location services may also be limited. https://www.samsung.com/us/support/galaxy-battery/optimization/

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Reduce power consumption with Light performance mode on your Galaxy device Last Update date : 2023-08-18 Light performance mode is a feature that enhances heat generation and battery usage by changing the processing speed to partially adjust it to improve battery consumption. When operating in Light performance mode, the device can use less performance power compared to normal mode with no impact to internet surfing, social media, phone calls or video playback.  https://www.samsung.com/ae/support/mobile-devices/how-to-use-galaxy-s23-light-mode/ (upon information and belief the same features exist in US models)

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Samsung Galaxy A20 - Manage Battery Saving Settings Power Saving mode helps extend battery life on your Galaxy A20 by reducing performance and limiting vibration, location services, and most background data. 1. Open the Settings app. 2. Navigate: Battery and device care › Battery › Power saving mode. 3. Tap the Power saving mode switch to turn on or off. 4. When turned off, you can customize power saving options by tapping the following to turn on or off: • Limit CPU speed to 70% • Decrease brightness by 10% • Limit apps and Home screen https://www.verizon.com/support/knowledge-base-308608/ <u>Doctrine of Equivalents</u> To the extent Samsung argues that this limitation is not literally met in any Accused Samsung '417 Products, Maxell asserts that this limitation is met under the doctrine of equivalents because the identified structure matches the function, way, and result of the claimed element and, to the extent there is a difference, the difference is insubstantial. For example, to the extent that Samsung argues that the Accused Samsung '417 Products do not include a clock controller, each of these products includes software, hardware, or a combination of the two that perform the equivalent function of controlling the frequency of the clock signal so as to become a frequency higher than the second frequency when a specific processing is executed even if the mobile terminal is in the closed condition, and controls the frequency of the clock signal so as to become the second frequency after the execution is completed. Using this software, hardware, or combination of the two, these products perform substantially the same function in substantially the same way as

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	claimed. The performance of this function achieves substantially the same result, for example, returning the products to the closed condition when none of these processes are being performed and operating in the second frequency.
[2.] The mobile terminal according to claim 1, wherein the specific processing is a processing having an effect on a response to a request from the user.	Each of the Accused Samsung '417 Products implements specific processing that is a processing having an effect on a response to a request from the user. For example, Samsung Galaxy S23 executes a variety of specific processing that are executed in response to a request from the user (i.e., by selecting an option of “selfie,” “camera,” askign Bixby to take a selfie/picture and/or answering or rejecting a call). Samsung Galaxy S23 performing specific processing when the user inputs request by selecting “Camera” and/or pressing the circular icon to capture photo.

Maxell, Ltd.

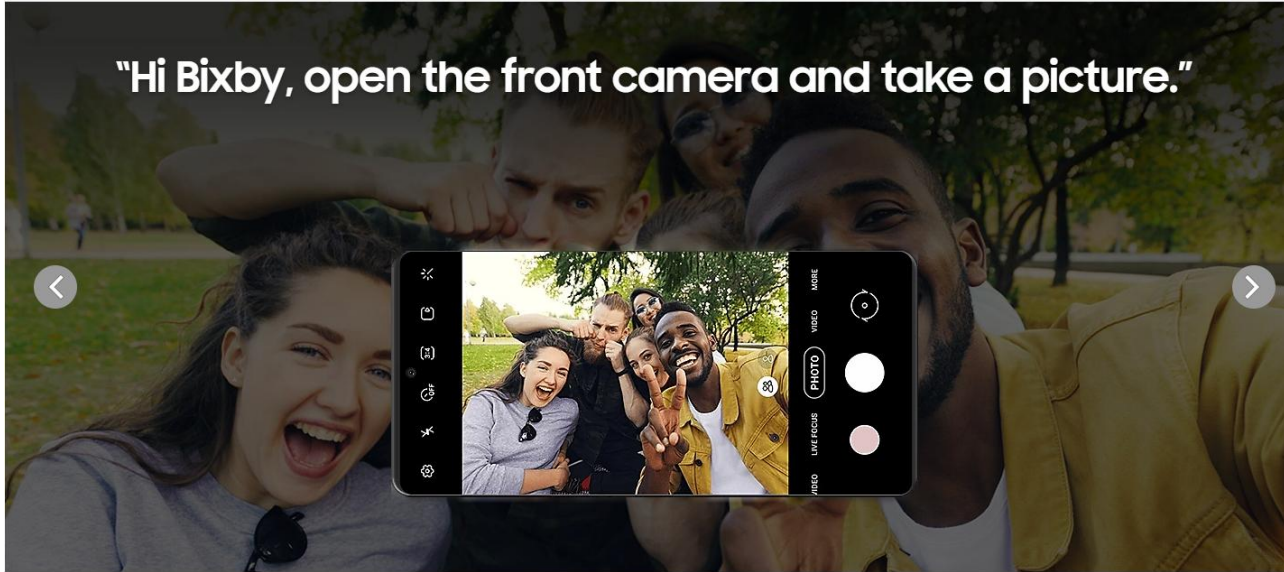
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	As an additional example, the Samsung Galaxy S23 performs specific processing when a user answers a call by swiping the green icon or declines a call by swiping the red icon.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Do more with Bixby Bixby gives you the freedom to focus on what matters most. It learns what you like to do and works with your favorite apps and services to help you get more things done.  "Hi Bixby, take a selfie." https://www.samsung.com/us/apps/bixby/

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	"Hi Bixby, open the front camera and take a picture."  <i>Id.</i>

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. ○ From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Settings Zoom Shooting modes Gallery Capture Switch cameras Galaxy S23 Ultra technical specification; https://downloadcenter.samsung.com/content/UM/202302/20230228053129621/SAM_S911_S916_S918_EN_UM_OS13_020223_FINAL_AC_022023.pdf at 58.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. ○ From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Expert RAW: Download the Expert RAW shooting mode. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. <i>Id.</i> at 59–60.

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NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS**

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. <i>Id.</i> at 74; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ○ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ○ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. <i>Id.</i> at 41.

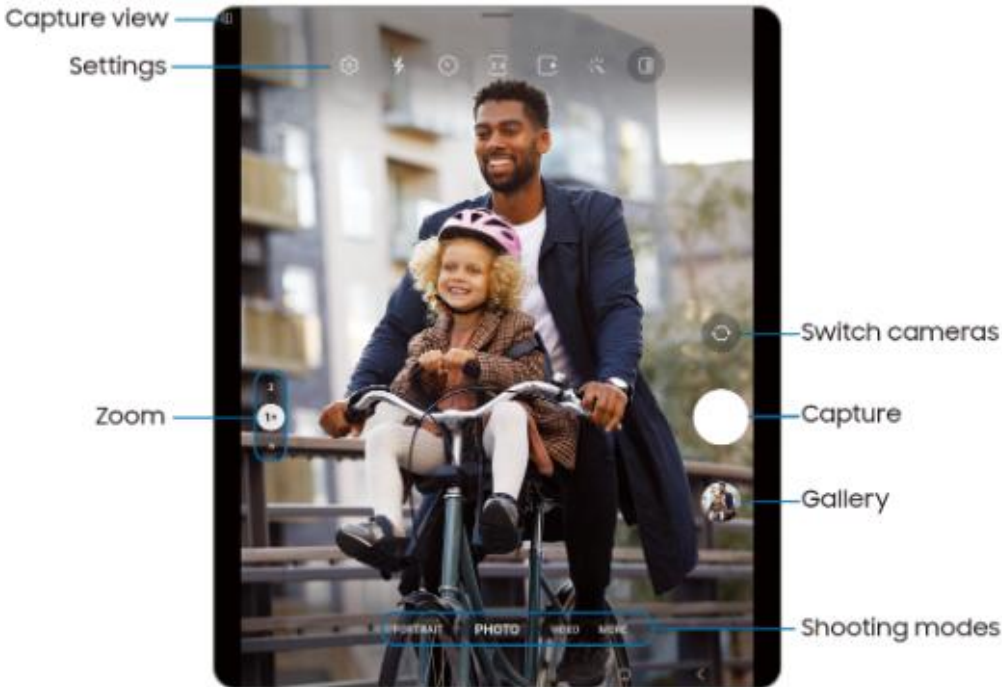
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Introduction Bixby is a user interface that helps you use your device more conveniently. You can talk to Bixby or type text. Bixby will launch a feature you request or show the information you want. Visit www.samsung.com/bixby for more information.  Bixby is only available in some languages, and it may not be available depending on the region. Starting Bixby Press and hold the Side key to launch Bixby. The Bixby intro page will appear. After you select the language to use with Bixby, sign in to your Samsung account, and complete the setup by following the on-screen instructions, the Bixby screen will appear. Using Bixby While pressing and holding the Side key, say what you want to Bixby. Alternatively, say the wake-up phrase and say what you want. For example, while pressing and holding the Side key, say “How’s the weather today?” The weather information will appear on the screen. If Bixby asks you a question during a conversation, you can continue to talk to Bixby without pressing the Side key or tapping . Waking up Bixby using your voice You can start a conversation with Bixby by saying “Hi, Bixby” or “Bixby”. Register your voice so that Bixby will respond to your voice. 1 Open the Bixby app and tap  → Voice wake-up. 2 Tap the switch to turn it on. 3 Select a wake-up phrase you want under Wake-up phrase. 4 Tap the Respond to my voice switch to turn it on. 5 Follow the on-screen instructions to complete the setup. Now you can say the wake-up phrase and start a conversation.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Communicating by typing text If your voice is not recognized because of noisy environments or if you are in a situation where speaking is difficult, you can communicate with Bixby through text. Open the Bixby app, tap , and then type what you want. During the communication, Bixby also will answer you through text instead of voice feedback. Bixby Vision Introduction Bixby Vision is a service that provides various features based on image recognition. You can use Bixby Vision to search for information by recognizing objects.  • This feature may not be available or you might not get correct search results depending on the image size, format, or resolution. • Samsung is not responsible for the product information provided by Bixby Vision. Launching Bixby Vision Launch Bixby Vision using one of these methods. • In the Camera app, tap MORE on the shooting modes list and tap BIXBY VISION. • In the Gallery app, select an image and tap . • In the Samsung Internet app, touch and hold an image and tap Search with Bixby Vision. • If you added the Bixby Vision app icon to the Apps screen, open the Bixby Vision app. Using Bixby Vision 1 Launch Bixby Vision. 2 Select a feature you want to use. • TRANSLATE: Recognize text from documents or images and translate it. • TEXT: Recognize text from documents or images and extract it. • DISCOVER: Search for images similar to the recognized object online and related information.  The available features and search results may vary depending on the region or carrier. Galaxy S23 Series User Guide at pg. 88-90.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Fold4 Camera features  Capture and view View the pictures and videos you capture while still using your camera. Images will be shown on the side panel until the Camera app is closed. This feature is only available when the device is open. From  Camera, tap  Capture View. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_fold4_camera_features_d1e3185.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. ◦ From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. Galaxy Z Fold4 technical specification; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/configure_shooting_mode_d1e3233.html.

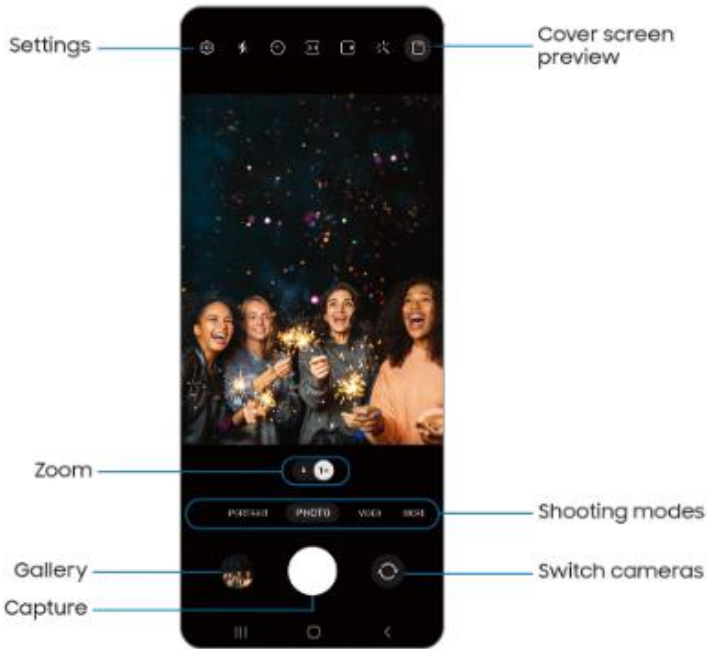
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/samsung_apps_d1e4429.html#d1e4524; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ◦ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ◦ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/bixby_d1e1993.html#d1e2011.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Flip4 Camera features  The image shows the camera app interface on a Galaxy Z Flip4. Labels point to the following features: 'Settings' (top left icon), 'Cover screen preview' (top right icon), 'Zoom' (middle slider), 'Shooting modes' (bottom row: PORTRAIT, PHOTO, VIDEO, MORE), 'Switch cameras' (bottom right icon), 'Gallery' (bottom left icon), and 'Capture' (bottom center shutter button). Selfies in Flex mode Use your camera in Flex mode for hands-free selfies. 1. Place your phone on a flat surface in table top view. 2. From  Camera, tap Portrait. 3. Tap  or  to move the camera preview to the top or bottom half of the screen. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_flip4_camera_features_d1e3206.html.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
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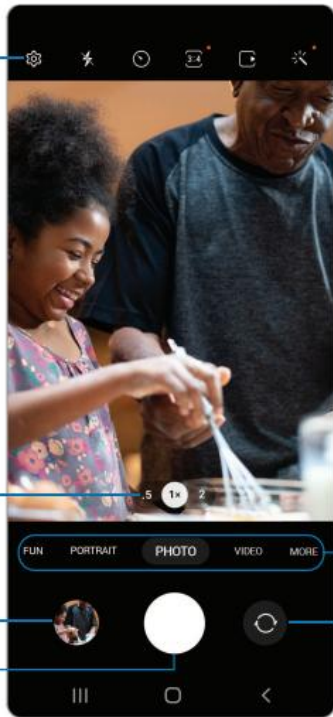
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	 Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/samsung_apps_d1e4429.html#d1e4524; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ◦ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ◦ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/bixby_d1e1993.html#d1e2011.

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	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Galaxy A54 5G technical specifications; https://downloadcenter.samsung.com/content/UM/202304/20230407022332214/SAM_A546_EN_UM_OS13_040523_FINAL.pdf at 40.

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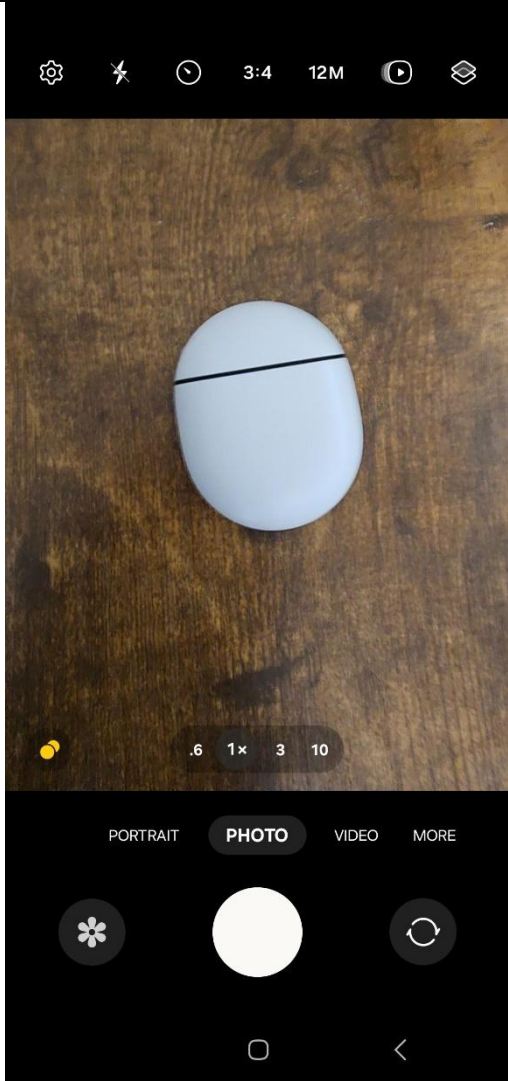
APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ○ From a Home screen, press and hold the Side key. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ○ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. <i>Id.</i> at 24.

**APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT
NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS**

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
[3.] The mobile terminal according to claim 1, wherein the specific processing is an image decoding processing or an address retrieval processing or a character conversion processing.	Each of the Accused Samsung '417 Products implements specific processing such as processing is an image decoding processing or an address retrieval processing or a character conversion processing. For example, the Samsung Galaxy S23, taking a picture includes image decoding processing and receiving/answering an incoming call includes address retrieval (e.g., retrieval from an address in memory the name and information of a caller so that the name “John Doe” can be displayed.

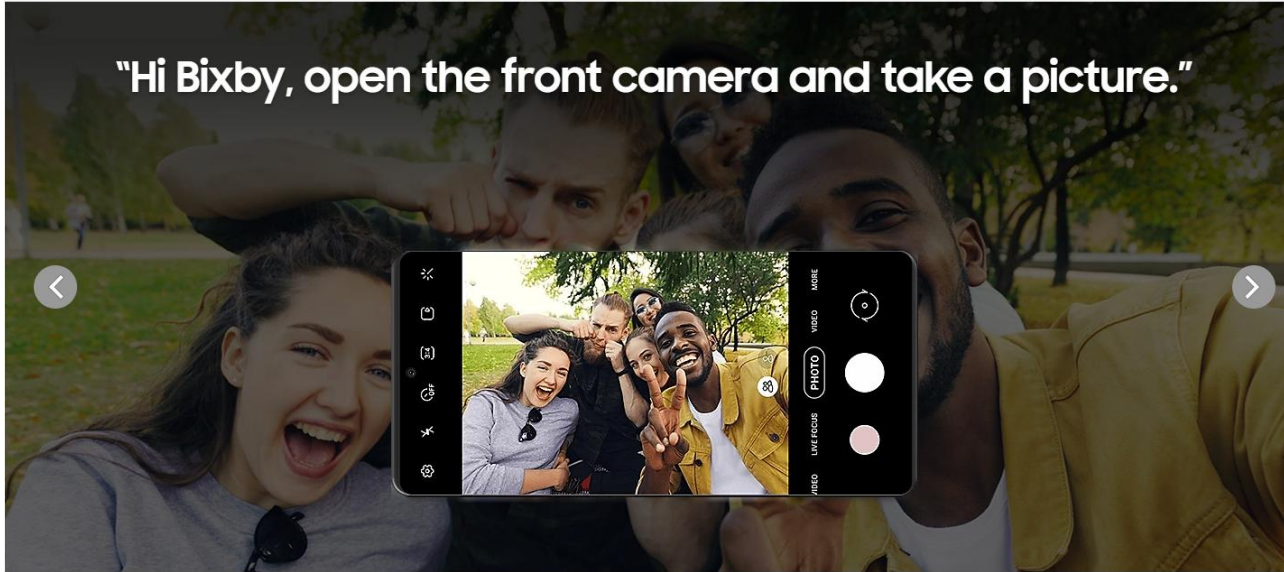
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	A screenshot of a Samsung Galaxy S23 camera interface. The top status bar shows icons for settings, flash, timer, aspect ratio (3:4), resolution (12M), and other camera controls. The main viewfinder shows a white computer mouse on a dark wooden surface. The bottom of the screen shows camera controls: a yellow focus lock icon, a zoom slider with values .6, 1x, 3, and 10, and mode buttons for PORTRAIT, PHOTO (selected), VIDEO, and MORE. Below these are icons for a grid, a large white shutter button, and a refresh/clear icon. At the very bottom are the back and home navigation icons. Samsung Galaxy S23 performing image decoding.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Do more with Bixby Bixby gives you the freedom to focus on what matters most. It learns what you like to do and works with your favorite apps and services to help you get more things done.  https://www.samsung.com/us/apps/bixby/

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	"Hi Bixby, open the front camera and take a picture."  <i>Id.</i>

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. ○ From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Galaxy S23 Ultra technical specification; https://downloadcenter.samsung.com/content/UM/202302/20230228053129621/SAM_S911_S916_S918_EN_UM_OS13_020223_FINAL_AC_022023.pdf at 58.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. ○ From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Expert RAW: Download the Expert RAW shooting mode. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. <i>Id.</i> at 59–60.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. <i>Id.</i> at 74; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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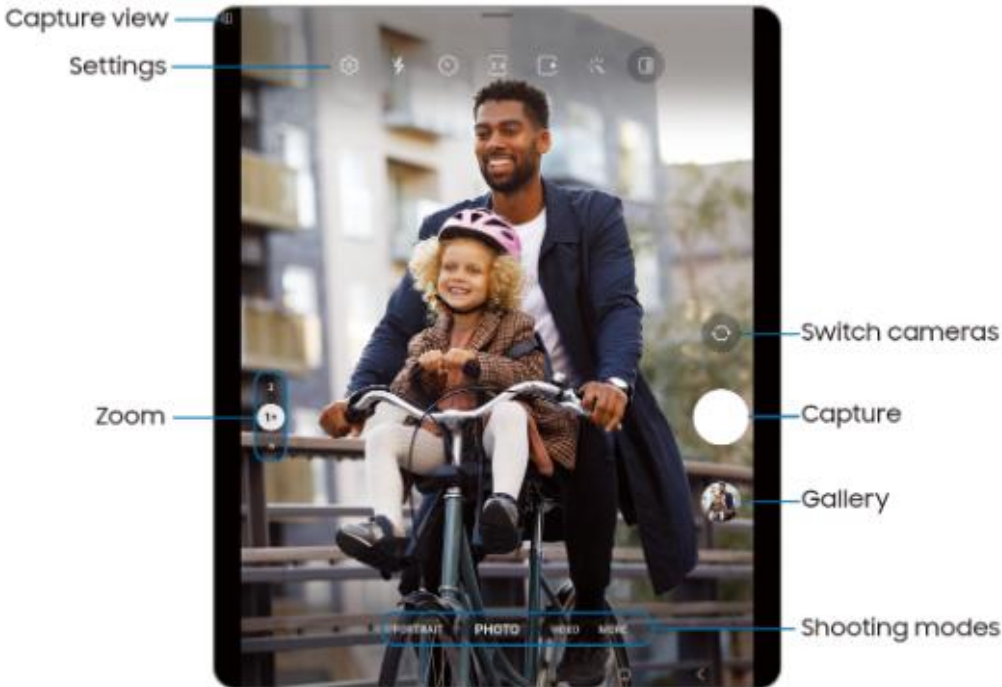
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Bixby Introduction Bixby is a user interface that helps you use your device more conveniently. You can talk to Bixby or type text. Bixby will launch a feature you request or show the information you want. Visit www.samsung.com/bixby for more information.  Bixby is only available in some languages, and it may not be available depending on the region. Starting Bixby Press and hold the Side key to launch Bixby. The Bixby intro page will appear. After you select the language to use with Bixby, sign in to your Samsung account, and complete the setup by following the on-screen instructions, the Bixby screen will appear. Using Bixby While pressing and holding the Side key, say what you want to Bixby. Alternatively, say the wake-up phrase and say what you want. For example, while pressing and holding the Side key, say “How’s the weather today?” The weather information will appear on the screen. If Bixby asks you a question during a conversation, you can continue to talk to Bixby without pressing the Side key or tapping . Waking up Bixby using your voice You can start a conversation with Bixby by saying “Hi, Bixby” or “Bixby”. Register your voice so that Bixby will respond to your voice. 1 Open the Bixby app and tap  → Voice wake-up. 2 Tap the switch to turn it on. 3 Select a wake-up phrase you want under Wake-up phrase. 4 Tap the Respond to my voice switch to turn it on. 5 Follow the on-screen instructions to complete the setup. Now you can say the wake-up phrase and start a conversation.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Communicating by typing text If your voice is not recognized because of noisy environments or if you are in a situation where speaking is difficult, you can communicate with Bixby through text. Open the Bixby app, tap , and then type what you want. During the communication, Bixby also will answer you through text instead of voice feedback. Bixby Vision Introduction Bixby Vision is a service that provides various features based on image recognition. You can use Bixby Vision to search for information by recognizing objects.  • This feature may not be available or you might not get correct search results depending on the image size, format, or resolution. • Samsung is not responsible for the product information provided by Bixby Vision. Launching Bixby Vision Launch Bixby Vision using one of these methods. • In the Camera app, tap MORE on the shooting modes list and tap BIXBY VISION. • In the Gallery app, select an image and tap . • In the Samsung Internet app, touch and hold an image and tap Search with Bixby Vision. • If you added the Bixby Vision app icon to the Apps screen, open the Bixby Vision app. Using Bixby Vision 1 Launch Bixby Vision. 2 Select a feature you want to use. • TRANSLATE: Recognize text from documents or images and translate it. • TEXT: Recognize text from documents or images and extract it. • DISCOVER: Search for images similar to the recognized object online and related information.  The available features and search results may vary depending on the region or carrier. Galaxy S23 Series User Guide at pg. 88-90.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Fold4 Camera features  Capture and view View the pictures and videos you capture while still using your camera. Images will be shown on the side panel until the Camera app is closed. This feature is only available when the device is open. From  Camera, tap  Capture View. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_fold4_camera_features_d1e3185.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Configure shooting mode Allow the camera to determine the ideal mode for your pictures or choose from several shooting modes. - o From  Camera, swipe the screen right and left to change shooting modes. • Portrait: Adjust the background of your shots for portrait photos. • Photo: Allow the camera to determine the ideal settings for pictures. • Video: Allow the camera to determine the ideal settings for videos. • More: Choose other available shooting modes. Tap  Add to drag modes into or out of the shooting modes tray at the bottom of the Camera screen. - Pro: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while taking pictures. - Pro video: Manually adjust the ISO sensitivity, exposure value, white balance, and color tone while recording videos. - Single take: Capture multiple pictures and video clips from different angles. - Panorama: Create a linear image by taking pictures in either a horizontal or vertical direction. - Night: Use this to take photos in low-light conditions, without using the flash. - Food: Take pictures that emphasize the vivid colors of food. - Super slow-mo: Record videos at an extremely high frame rate for viewing in high quality slow motion. You can play a specific section of each video in slow motion after recording it. - Slow motion: Record videos at a high frame rate for viewing in slow motion. - Hyperlapse: Create a time lapse video by recording at various frame rates. The frame rate is adjusted depending on the scene being recorded and the movement of the device. - Portrait video: Adjust the background of your shots for portrait videos. - Director's view: Access advanced features such as lock onto a subject in view, change between different rear camera lenses, and more. Galaxy Z Fold4 technical specification; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/configure_shooting_mode_d1e3233.html.

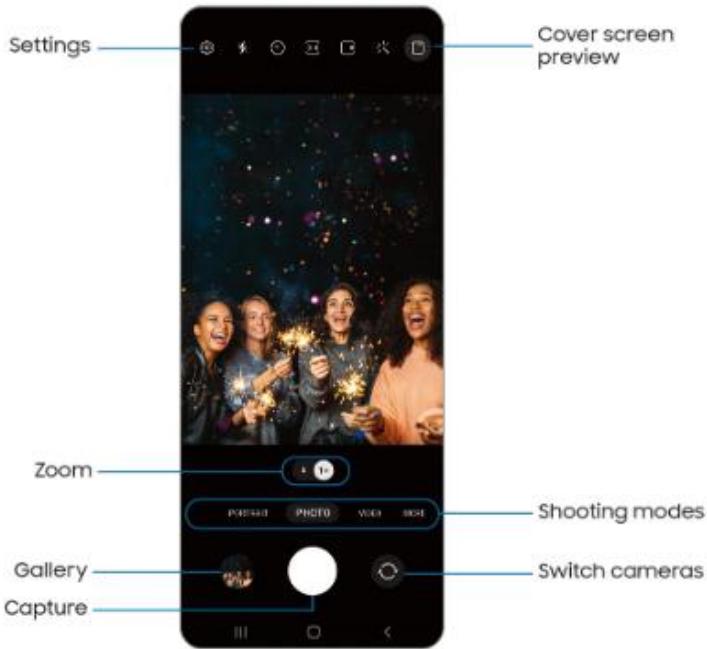
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	 Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/samsung_apps_d1e4429.html#d1e4524; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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	Bixby Bixby is a virtual assistant that learns, evolves, and adapts to you. It learns your routines, helps you set up reminders based on time and location, and is built in to your favorite apps. Visit samsung.com/us/support/owners/app/Bixby for more information. ◦ From a Home screen, press and hold the Side key.  TIP You can also access Bixby from the Apps list. Bixby Vision Bixby is integrated with your Camera, Gallery, and Internet apps to give you a deeper understanding of what you see. It provides contextual icons for translation, QR code detection, landmark recognition, or shopping. Camera Bixby Vision is available on the Camera viewfinder to help understand what you see. ◦ From  Camera, tap More > Bixby Vision and follow the prompts. Gallery Bixby Vision can be used on pictures and images saved in the Gallery app. 1. From  Gallery, tap a picture to view it. 2. Tap  Bixby Vision and follow the prompts. Internet Bixby Vision can help you find out more about an image you find in the Internet app. 1. From  Internet, touch and hold an image until a pop-up menu is displayed. 2. Tap Search with Bixby Vision and follow the prompts. Galaxy Z Fold4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/bixby_d1e1993.html#d1e2011.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	Galaxy Z Flip4 Camera features  The image shows the camera app interface on a Galaxy Z Flip4. Labels point to the following features: 'Settings' (top left icon), 'Cover screen preview' (top right icon), 'Zoom' (middle slider), 'Shooting modes' (bottom row: PORTRAIT, PHOTO, VIDEO, MORE), 'Switch cameras' (bottom right icon), 'Gallery' (bottom left icon), and 'Capture' (bottom center shutter button). Selfies in Flex mode Use your camera in Flex mode for hands-free selfies. 1. Place your phone on a flat surface in table top view. 2. From  Camera, tap Portrait. 3. Tap  or  to move the camera preview to the top or bottom half of the screen. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/galaxy_z_flip4_camera_features_d1e3206.html.

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
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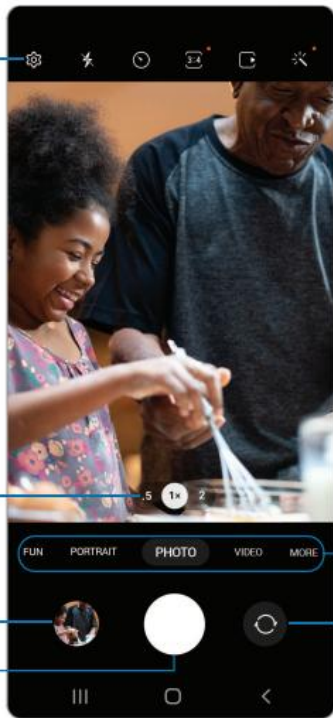
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	 Bixby Bixby displays customized content based on your interactions. Bixby learns from your usage patterns and suggests content you may like. For more information, see Bixby. Galaxy Z Flip4 technical specifications; https://downloadcenter.samsung.com/content/PM/202303/20230313225909630/EB/SAM_F936_F721_EN_FINAL_230201/samsung_apps_d1e4429.html#d1e4524; https://www.samsung.com/us/apps/bixby/; https://www.samsung.com/us/apps/bixby/bixby-user-guide/.

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	 Camera Enjoy a full kit of pro lenses and pro-grade video modes and settings. From Apps, tap  Camera.  TIP Quickly press the Side key twice to open the Camera app.  Settings — Zoom — Shooting modes — Gallery — Capture — Switch cameras — Galaxy A54 5G technical specifications; https://downloadcenter.samsung.com/content/UM/202304/20230407022332214/SAM_A546_EN_UM_OS13_040523_FINAL.pdf at 40.

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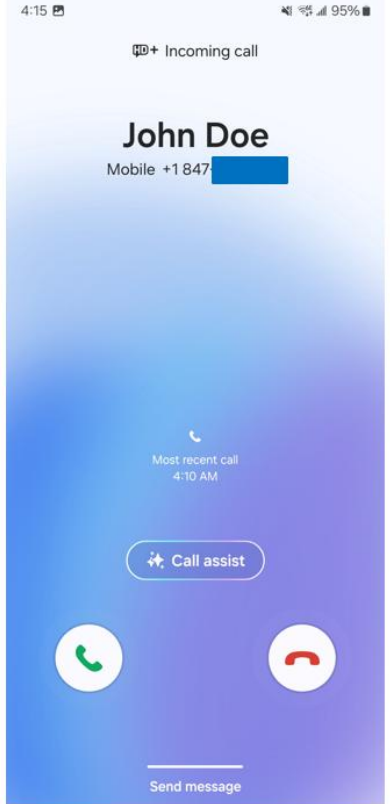
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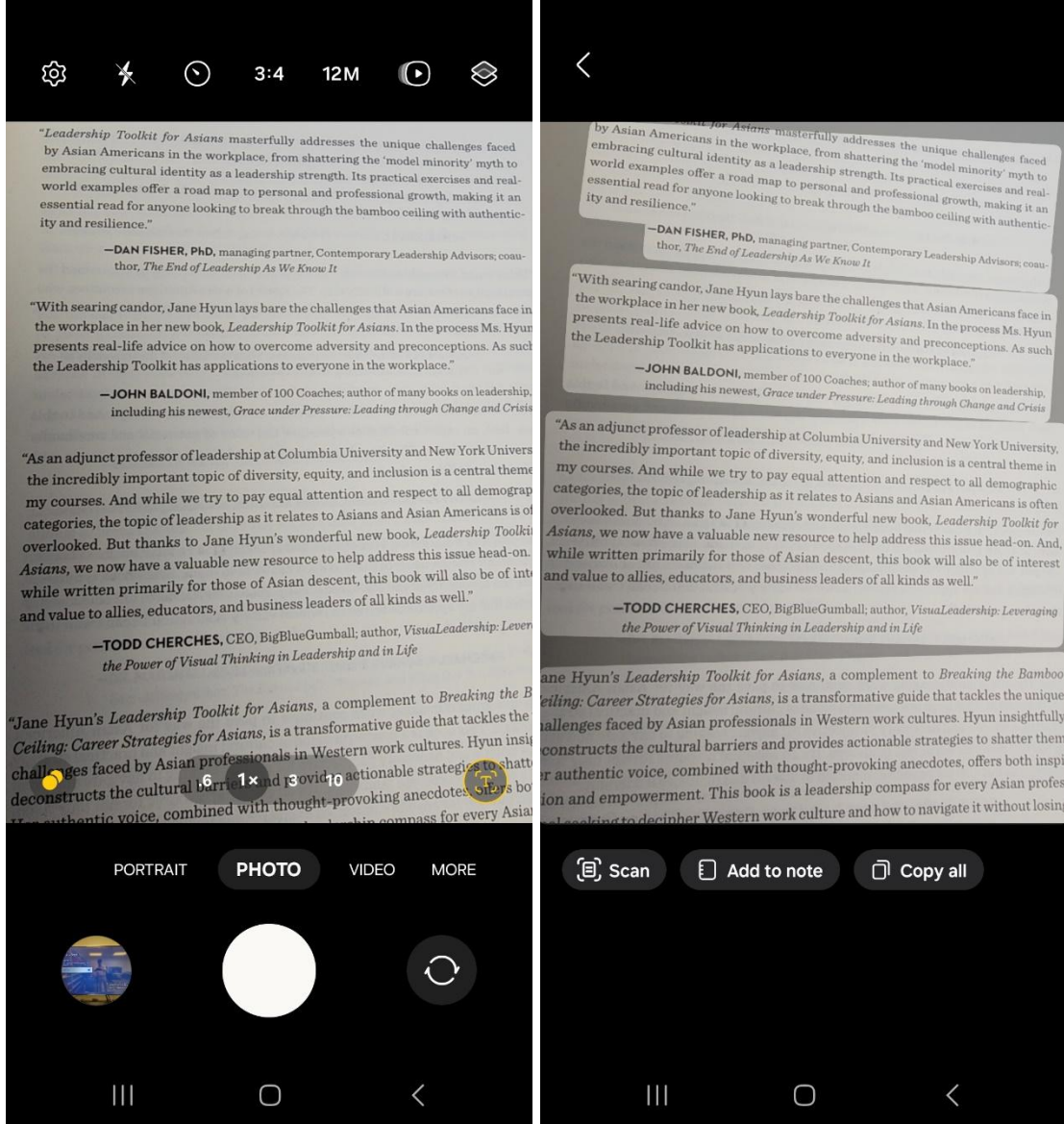
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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 The Samsung S23 illustrating address retrieval processing. When receiving an incoming call, the phone accesses its contact list to retrieve and display the caller’s saved name, “John Doe,” on the screen. As an additional example, the Accused Samsung Gaaxy S23 performs “character conversion processing,” using camera application to capture text from a photographed object or to perform scanning function.

APPENDIX 3: OCTOBER 20, 2025 INFRINGEMENT CONTENTIONS APPLYING CLAIMS 1-3 AND 7 OF U.S. PATENT NO. 7,577,417 TO ACCUSED SAMSUNG '417 PRODUCTS

U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 The image shows two side-by-side screenshots of a smartphone screen displaying a document titled "Leadership Toolkit for Asians". The document contains several paragraphs of text and quotes from various individuals. The top screenshot shows the beginning of the document, and the bottom screenshot shows the end. The text is clearly legible and matches the content in the "Exemplary Evidence of Infringement" column. Top Screenshot Text: "Leadership Toolkit for Asians masterfully addresses the unique challenges faced by Asian Americans in the workplace, from shattering the 'model minority' myth to embracing cultural identity as a leadership strength. Its practical exercises and real-world examples offer a road map to personal and professional growth, making it an essential read for anyone looking to break through the bamboo ceiling with authenticity and resilience." —DAN FISHER, PhD, managing partner, Contemporary Leadership Advisors; coauthor, <i>The End of Leadership As We Know It</i> "With searing candor, Jane Hyun lays bare the challenges that Asian Americans face in the workplace in her new book, <i>Leadership Toolkit for Asians</i>. In the process Ms. Hyun presents real-life advice on how to overcome adversity and preconceptions. As such the Leadership Toolkit has applications to everyone in the workplace." —JOHN BALDONI, member of 100 Coaches; author of many books on leadership, including his newest, <i>Grace under Pressure: Leading through Change and Crisis</i> "As an adjunct professor of leadership at Columbia University and New York University, the incredibly important topic of diversity, equity, and inclusion is a central theme in my courses. And while we try to pay equal attention and respect to all demographic categories, the topic of leadership as it relates to Asians and Asian Americans is often overlooked. But thanks to Jane Hyun's wonderful new book, <i>Leadership Toolkit for Asians</i>, we now have a valuable new resource to help address this issue head-on. While written primarily for those of Asian descent, this book will also be of interest and value to allies, educators, and business leaders of all kinds as well." —TODD CHERCHES, CEO, BigBlueGumball; author, <i>VisualLeadership: Leveraging the Power of Visual Thinking in Leadership and in Life</i> Bottom Screenshot Text: Jane Hyun's <i>Leadership Toolkit for Asians</i>, a complement to <i>Breaking the Bamboo Ceiling: Career Strategies for Asians</i>, is a transformative guide that tackles the unique challenges faced by Asian professionals in Western work cultures. Hyun insightfully deconstructs the cultural barriers and provides actionable strategies to shatter them. Her authentic voice, combined with thought-provoking anecdotes, offers both inspiration and empowerment. This book is a leadership compass for every Asian professional looking to decipher Western work culture and how to navigate it without losing

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	The image on the left shows the camera application detecting text on a page, as indicated by the yellow “Scan text” icon appearing over the words. The image on the right shows the result after the user taps the icon: the device has performed character conversion processing to capture and highlight the text from the object, providing options to “Scan,” “Add to note,” or “Copy all” of the converted text.
[7.] The mobile terminal according to claim 1, wherein the mobile terminal has a folded structure.	Each of the Subset of Accused Samsung '417 Products² is a mobile terminal with a folded structure. Specifically, the Samsung Z Families (Samsung Galaxy Z Flip Family and Samsung Galaxy Z Fold Family) have a folded structure. 

² The Subset of Accused Samsung '417 Products include the Galaxy Z Flip, Galaxy Z Flip 5G, Galaxy Z Flip3 5G, Galaxy Z Flip4, Galaxy Z Flip5, Galaxy Z Flip7 FE, Galaxy Z Fold2 5G, Galaxy Z Fold3 5G, Galaxy Z Fold4, and Galaxy Z Fold5. Maxell reserves the right to accuse additional products as discovery proceeds in this investigation.

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	 https://www.samsung.com/us/smartphones/galaxy-z-flip5/buy/galaxy-z-flip5-256gb-at-t-sm-f731uzawatt/

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U.S. Patent No. 7,577,417	Exemplary Evidence of Infringement
	 https://www.samsung.com/us/smartphones/galaxy-z-fold5/buy/galaxy-z-fold5-512gb-verizon-sm-f946uzeevzw/