

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO., LTD. AND  
SAMSUNG ELECTRONICS AMERICA, INC.

Petitioners,

v.

MAXELL, LTD.,  
Patent Owner

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**Case: IPR2025-01309**

**U.S. Patent No. 7,577,417**

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**PATENT OWNER'S RESPONSE  
TO PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NO. 7,577,417**

Mail Stop **Patent Board**  
Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box 1450  
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**PATENT OWNER'S EXHIBIT LIST**

| <b>Description</b>                                                                                                                                                 | <b>Exhibit #</b> |
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| Follow-up Notice Letter to Samsung (December 29, 2021)                                                                                                             | 2002             |
| Docket Navigator Time to Trial Statistics for the Eastern District of Texas                                                                                        | 2003             |
| Docket Control Order, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00092-RWS (E.D. Tex.)                                                          | 2004             |
| Jury Trial Transcript, Vol. 4, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00092-RWS (E.D. Tex.)                                                 | 2005             |
| Complaint, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00092-RWS (E.D. Tex.)                                                                     | 2006             |
| Follow-up Notice Letter to Samsung (April 21, 2025)                                                                                                                | 2007             |
| Law360 Article, "Maxell Settles Patent Suit Against Apple Over Mobile Tech"                                                                                        | 2008             |
| Law360 Article, "Maxell Scores \$43M EDTX Jury Win In ZTE Patent Trial"                                                                                            | 2009             |
| Law360 Article, "Maxell, Huawei Reach Terms To End Smartphone Patent Suit"                                                                                         | 2010             |
| Hudson Institute Article, "Google's Loss to Sonos Settles It, Big Tech Has an IP Piracy Problem"                                                                   | 2011             |
| PatentRenewal.com Article, "which-companies-hold-the-most-patents-in-the-world"                                                                                    | 2012             |
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| “Make calls and send messages from your Galaxy tablet”<br>( <a href="https://www.samsung.com/us/support/answer/ANS10001614/">https://www.samsung.com/us/support/answer/ANS10001614/</a> ) | 2017        |
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| <b>Deposition Transcript of Dr. R. Jacob Baker</b>                                                                                                                                        | <b>2022</b> |
| <b>Advanced Configuration and Power Interface Specification<br/>Revision 1.0 (Dec. 22, 1996)</b>                                                                                          | <b>2023</b> |
| <b>Advanced Configuration and Power Interface Specification<br/>Revision 2.0 (July 27, 2000)</b>                                                                                          | <b>2024</b> |

**LISTING OF CHALLENGED CLAIMS<sup>1</sup>**

| <b>Claim</b> | <b>Claim Text</b>                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1pre]       | A mobile terminal capable of being changed from an open condition into a closed condition, comprising:                                                                                                                                                                                                                                                                               |
| [1a]         | a processor which executes program processing; and,                                                                                                                                                                                                                                                                                                                                  |
| [1b]         | a clock controller capable of changing a frequency of a clock signal to be fed to the processor;                                                                                                                                                                                                                                                                                     |
| [1c]         | 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                                               |
| [1d]         | 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. |
| [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.                                                                                                                                                                                                                                 |
| [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.                                                                                                                                                                                                   |
| [4pre]       | The mobile terminal according to claim 1, further comprising:                                                                                                                                                                                                                                                                                                                        |

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<sup>1</sup> For convenience purposes only, Patent Owner adopts for this Response the numbering of claims advanced by Petitioners in the Petition (Paper 3) on page iv. Patent Owner does not concede the appropriateness of such grouping and numbering of claim elements.

|      |                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [4a] | an input unit which allows a user of the mobile terminal to set the frequency of the clock signal,                                                                   |
| [4b] | wherein when the frequency is set by the user using the input unit, the first frequency is the frequency set by the user using the input unit.                       |
| [5]  | The mobile terminal according to claim 4, wherein the user can set the frequency of the clock signal in every processing using the input unit.                       |
| [6]  | The mobile terminal according to claim 1, further comprising a display which exhibits a display corresponding to the magnitude of the frequency of the clock signal. |
| [7]  | The mobile terminal according to claim 1, wherein the mobile terminal has a folded structure.                                                                        |

## **I. INTRODUCTION**

Patent Owner Maxell, Ltd. (“Patent Owner”) respectfully submits this Response because Petitioners Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (hereinafter “Petitioners” or “Samsung”) have failed to demonstrate that the challenged claims of U.S. Patent No. 7,577,417 (“the ’417 Patent”) (EX1001) are unpatentable. The Board should confirm the patentability of claims 1-7 (“challenged claims”).

The Petition fails on multiple independent grounds. First, the intrinsic record confirms that the claimed “mobile terminal” is a cellular phone, not a laptop computer, which defeats Petitioners’ Belt-centric grounds at the threshold. Second, even under Petitioners’ broader reading, Belt does not disclose or render obvious the closed-condition clock-frequency control required by limitations [1c] and [1d]. Third, Petitioners’ proposed multi-reference combinations rely on hindsight reconstruction and speculation rather than teachings grounded in the art—a deficiency confirmed by Petitioners’ own expert, Dr. R. Jacob Baker, at his deposition. EX2022. Accordingly, the Board should confirm the patentability of all challenged claims.

## **II. BACKGROUND**

### **A. Overview of the '417 Patent**

The '417 Patent is directed to power management and specifically teaches changing clock frequencies to lower a device's current consumption. The frequency of the clock signal delivered to the CPU is raised when the user requests specific processing and then lowered upon completion to reduce current consumption. EX1001, 4:32-40. The '417 Patent teaches and claims a clock controller changing the clock frequency fed to the processor by increasing the frequency during the execution of a specific processing—even if the mobile device is in a closed condition—and then decreasing the frequency once completed. *Id.*, claim 1. Thus, the invention of the '417 Patent allows a mobile device to operate in a more efficient manner and improves battery life by controlling clock frequency.

More specifically, at the time of the invention of the '417 Patent (which claims priority to April 3, 2002), conventional mobile devices did not account for battery depletion when enhancing processing speed. EX1001, 1:15-39. To improve processing power, mobile devices switched a clock frequency to a high-speed mode frequency higher than a normal frequency based on internal conditions, such as power source voltage and ambient temperature. *Id.*, 1:21-25. Such conditions left no

room for interposition of the will of a user in switching the speed of the clock signal and drove the central processing unit (CPU) at a higher frequency—increasing the device's current consumption. *Id.*, 1:27-34. The '417 Patent provided a new power management solution and taught a controlled clock signal frequency fed to the CPU. *Id.*, 3:3-6. This clock frequency-based power management provided a mechanism to control processing speed and to reduce current consumption, which thereby prevented battery depletion. *Id.*, 1:44-52.

Other inventors had proposed particular solutions in the field of power management, but these alternative solutions did not solve all of the problems that would face a person of ordinary skill in the art. For example, inventors at Nokia Mobile Phones, Ltd. disclosed adjusting the operating voltage and the clock frequency simultaneously on the basis of the performance required by the application used at a given time. *See* EX2016, 3:30-4:3. This solution was not sufficient at least because it failed to adjust the frequency of the clock signal when a specific processing is executed when the mobile terminal is in a closed condition (*i.e.*, standby or waiting for cellular phone communication), which would lead to slower processing speed paired with an increase in current consumption. Thus, other solutions in this field had been proposed, but were inadequate.

As part of its solution, the '417 Patent teaches at least the use of a clock manipulation unit and/or an operation panel and a clock controller able to change a clock frequency to be fed to the CPU. EX1001, 3:2-13. The '417 Patent provided a practical and desirable concrete way of allowing the user to change the frequency of the clock signal in every processing, even with the device in a closed condition. Thus, the '417 Patent is directed to a specific improvement of the power management capabilities of a cellular phone and ties this improvement to the additional inventive concept of user-directed clock frequency manipulation.

### **B. Patent Prosecution History**

U.S. Application No. 11/480,971 (the "'971 Application"), which issued as the '417 Patent, was filed on July 6, 2006. The '971 Application claimed priority to U.S. Application No. 10/405,368, now abandoned. Both applications claim the benefit of Japanese Patent Application 2002-100735, filed on April 3, 2002.

During prosecution, the originally presented claims were rejected under 35 U.S.C. § 103 as obvious in view of U.S. Patent No. 6,484,041 to Aho et al. and U.K. Patent App. No. GB2297661 to Jambhekar et al. EX1002, at 30-31. However, the Examiner identified the closed-condition "specific processing" frequency control—what is now limitation [1d]—as the critical point of distinction over the applied art,

finding that “the applied references fail to disclose or render obvious the claimed limitation of the mobile terminal according to claim 1, 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.” EX1002, at 32. Claims 2-4 were noted as allowable if rewritten in independent form. *Id.* The patentee accordingly amended the claims to incorporate this distinguishing limitation, and the Examiner allowed what are now claims 1-7. *Id.* at 14. The prosecution history thus confirms the non-obviousness of the exact closed-condition behavior Petitioners have failed to demonstrate in this IPR.

### **C. Summary of Petitioners' Proposed Grounds for Unpatentability**

The Petition raises two grounds of alleged obviousness based on the following four references:

- U.S. Patent No. 5,303,171 (“Belt”) (EX1004),
- U.S. Patent No. 6,223,293 (“Foster”) (EX1005),
- U.S. Patent No. 5,630,148 (“Norris”) (EX1006), and
- U.S. Patent No. 6,094,565 (“Alberth”) (EX1007).

| Ground | '417 Patent Claim(s) | Type of Challenge | Primary Reference | Secondary Reference(s)                  |
|--------|----------------------|-------------------|-------------------|-----------------------------------------|
| 1      | 1-2, 4-7             | § 103             | Belt              | (1) Foster<br>(2) Norris                |
| 2      | 3                    | § 103             | Belt              | (1) Foster<br>(2) Norris<br>(3) Alberth |

**1. Belt (EX1004)**

Belt, titled “System Suspend on Lid Close and System Resume on Lid Open,” is a U.S. patent that issued on April 12, 1994 based on an application filed on April 3, 1992. Belt describes a portable computer system (*e.g.*, a laptop or notebook) that includes a housing, a lid supported on the housing for movement between open and closed positions, a keyboard supported on the housing below the lid, and a display provided on the lid. EX1004, Abstract. When the lid is opened, the keyboard is accessible and the display is visible. *Id.* When the lid is closed, the components are hidden and protected. The computer system has a processor with a first operation mode for executing instructions and a second operational mode in which it is in a reduced power suspend state. *Id.* The processor can automatically change between the first and second operational modes in response to a predetermined condition, such as the open or closed status of the lid. *Id.*

**2. Foster (EX1005)**

Foster, titled “Suspend/Resume Capability for a Protected Mode

Microprocessor,” is a U.S. patent that issued on April 24, 2001 based on an application filed on February 16, 1995. Foster discloses a laptop computer system with a protected mode microprocessor capable of operating in a restricted mode and an unrestricted mode. EX1005, Abstract. Additionally, Foster discloses an arrangement which saves information from the processor and then forcibly switches the processor to its unrestricted mode of operation in response to a predetermined condition. *Id.* When running a multi-tasking operating system where an application program is being executed in a restricted mode, a suspend/resume operation can be carried out in which the system is substantially powered down and then powered back up, and will resume the interrupted application with the restricted mode back in effect. *Id.* Further, setup changes such as adjustment of the processor speed can be made without exiting the application program running in the restricted mode. *Id.*

### **3. Norris (EX1006)**

Norris, titled “Dynamic Processor Performance and Power Management in a Computer System,” is a U.S. patent that issued on May 13, 1997 based on an application filed on February 28, 1996. Norris discloses a computer system comprising a clock generator circuit having a clock speed register and circuitry for generating a processor clock signal at a frequency determined by the clock speed

register. EX1006, Abstract. The processor in Norris executes a performance manager program that writes the clock speed register according to a performance state selected by an application program. *Id.* The application program selects the performance state to maximize performance during processor intensive functions and to maximize power conservation during interactive functions. *Id.*

#### **4. Alberth (EX1007)**

Alberth, titled “Closable Communication Device and Method of Operating the Same,” is a U.S. Patent that issued on July 25, 2000 based on an application filed June 30, 1997. Alberth discloses a closeable communication device that has a housing, an input device such as a button, and a controller disposed in the housing and coupled to the button. EX1007, Abstract. The housing is movable between a closed position and an opened position. *Id.* The controller is configured to employ one or more features that increase the usability of the device in the closed position, such as answering an incoming call to the device upon opening of the housing. *Id.*

### **III. PERSON OF ORDINARY SKILL IN THE ART**

For purposes of this proceeding only, Patent Owner agrees with Petitioners that a POSITA at the time of the invention of the '417 Patent would have a working knowledge of power management, gained through a degree in Electrical/Computer

Engineering or an equivalent degree, and at least one year of experience in the field of power management. Pet. at 8. Additional graduate education could substitute for professional experience, and significant experience in the field could substitute for formal education. Pet. at 8-9.

#### IV. CLAIM CONSTRUCTION

##### A. “mobile terminal”

Petitioners’ interpretation of “mobile terminal,” is overly broad and is inconsistent with the ’417 Patent specification. Accordingly, Patent Owner requests that “mobile terminal” be construed and/or interpreted consistent with the intrinsic record as a device that is or functions as a cellular phone, and not a laptop computer system.

In particular, the intrinsic record confirms that the claimed “mobile terminal” is a cellular phone, not a laptop computer system. EX2020, ¶¶26-30. There is no disclosure of “laptop computer system” or “personal computer” in the ’417 Patent. EX2020, ¶27. The Petition and expert declaration accompanying the Petition is completely **silent** as to any support for interpreting the claimed “mobile terminal” as a “laptop computer system.” Indeed, there is no analysis—not even a conclusory one by Petitioners’ expert—on why the claimed “mobile terminal” corresponds to a

“laptop computer system.” See Pet. at 9-10; EX1003, ¶¶56-57.

The '417 Patent does not disclose “laptop” even once, yet the specification discloses “cellular phone” at least forty-six times including in the Abstract, Background of the Invention, Brief Description of the Drawings, and Detailed Description of the Preferred Embodiments. See *generally* EX1001; EX2020, ¶27. For example, in the Abstract, the '417 Patent discloses “[t]here is provided a **cellular phone** taking into consideration enhancement in processing speed and reduction in current consumption, and the **cellular phone** comprises . . . .” EX1001, Abstract (emphases added). The '417 Patent further discloses that “[t]he **present invention** relates to a **cellular phone** comprising a central processing unit (CPU).” *Id.*, 1:15-16 (emphases added). Further, when describing all of the figures of the '417 Patent and its embodiments, the '417 Patent explicitly discloses that the embodiments “according to the invention” are directed to a cellular phone:

FIG. 1 is a block diagram showing the configuration of a first embodiment of a **cellular phone** according to the invention;

FIG. 2 is a block diagram showing the configuration of a second embodiment of a **cellular phone** according to the invention;

FIG. 3 is a block diagram showing the configuration of a third embodiment of a **cellular phone** according to the invention;

FIG. 4 is a block diagram showing the configuration of a fourth embodiment of a **cellular phone** according to the invention; and

FIG. 5 is a graph showing the relationship between an operation frequency of a central processing unit of the cellular phone according to the first to fourth embodiments, respectively, and current consumption.

*Id.*, 1:55-2:4; *see also* EX2020, ¶27.

Additional portions of the '417 Patent also repeatedly and consistently characterize the invention as being directed to a “cellular phone” including when describing the components and functions thereof, such as the CPU, control program, memory, “small” battery, frequency of clock signal, etc.:

A first embodiment of a cellular phone according to the invention is described hereinafter with reference to FIGS. 1 and 5. FIG. 1 is a block diagram showing the internal configuration of the cellular phone according to the first embodiment.

A central processing unit (CPU) 100 controls the operation of the cellular phone in accordance with a control program stored in a memory 110. The CPU 100 performs operation in frequency. By virtue of such a function as described, the user can set the frequency of the clock signal as appropriate at will depending on the user's use environments, such as the user's desire to execute high speed processing, or to use the cellular phone for many hours, the amount of the actual battery capacity that remains in a battery being small, and so forth, so that operability can be enhanced.

*Id.*, 2:10-20, 3:21-27.

Now, a second embodiment of a cellular phone according to the invention is described hereinafter with reference to FIG. 2. FIG. 2 is a block diagram showing the internal configuration of the cellular phone according to the second embodiment.

The first central processing unit 400 controls operation concerned with transmit/receive by the cellular phone in accordance with a control program stored in a first memory 420, and the second central processing unit 410 controls operation concerned with processing that has effects on the response of a user in accordance with a control program stored in a second memory 430. More specifically, the second

*Id.*, 4:4-8, 4:17-20.

For example, during a standby (waiting) period for communications by the cellular phone, the first central processing unit 400 is in intermittent operation to receive radio waves from the outside via an antenna 160, executing processing for recognition by the transmit/receive unit 150 that the radio waves received are radio waves corresponding to a telephone number dedicated to the present cellular phone. In this case,

The cellular phone shown in FIG. 2 further comprises a power supply controller 500. The power supply controller 500 controls power to be supplied from a battery 510 to the second central processing unit 410 in response to control by the first central processing unit 400. For example, during a

*Id.*, 4:41-47, 4:56-60.

Next, a third embodiment of a cellular phone according to the invention is described hereinafter with reference to FIG. 3.

The cellular phone shown in FIG. 3 comprises a battery voltage detector 600 in place of the power supply controller 500 incorporated in the cellular phone shown in FIG. 2. In FIG. 3, blocks denoted by the same reference numerals as those in FIG. 2 have the same functions as those of the blocks of the second embodiment, omitting therefore description thereof.

Further, a fourth embodiment of a cellular phone according to the invention is described hereinafter with reference to FIG. 4. FIG. 4 is a block diagram showing the internal configuration of the cellular phone of a folded structure, according to the fourth embodiment. In FIG. 4, blocks denoted by the same reference numerals as those in FIGS. 2 and 3, respectively, have the same functions as those of the blocks of the second and third embodiments, respectively, omitting therefore description thereof.

The cellular phone shown in FIG. 4 comprises a folding condition detector 700 for detecting whether the cellular phone is in a folded (closed) condition or in an unfolded (open) condition.

With the cellular phone according to the present embodiment, a first display unit 710 and a second display unit 720 are added to a first central processing unit 400 and a second central processing unit 410, respectively. The first display

*Id.*, 5:3-12, 5:26-42.

Since the operation of the cellular phone in the open condition is the same as that of the cellular phone according to the second and third embodiments, respectively, the operation of the cellular phone in the closed condition is described hereinafter.

Normally, in the closed condition, the cellular phone is often on standby (waiting) for cellular phone communications, and the first central processing unit 400 is in intermittent operation to receive radio waves from the outside via an antenna in the case of the closed condition. In the case of the cellular phone being in the closed condition, the user does not look at a display screen of the cellular phone, and is often in no hurry to do processing. Accordingly, in the case of the closed condition, processing can be executed while reducing power consumption by changing the frequency of the clock signal to a lower frequency. When the cellular phone is shifted to the open condition, the processing speed is enhanced by changing the frequency of the clock signal delivered to the second central processing unit 410 to a higher frequency.

The cellular phone shown in FIG. 4 further comprises a lighting controller 800 for controlling backlight of the second display unit 720. Since the user is unable to see the second

*Id.*, 5:46-54, 6:13-26.

The '417 Patent further distinguishes the described cellular phone from a laptop when referring to a “mobile terminal” as a “hand-held terminal” when referring to EX1028 (referencing EX1001, 1:17-20). This is consistent with EX1028, which separately describes “battery-powered portable personal computers” and “[o]n the other hand, portable terminal devices such as handheld terminals.” EX1028, ¶¶[0002], [0003]. Thus, as Patent Owner argued in its Preliminary Sur-Reply, EX1028 juxtaposes handheld terminals from computers when it states “[w]hen sending data from a handheld terminal to a host computer.” EX1028, ¶[0058]. The “handheld terminal” of EX1028 is clearly not a laptop computer.

EX2018 does not support Petitioners' claim construction arguments but instead underscores the understanding of a POSITA at the time of the invention that as used in the specification of the '417 Patent, a "mobile terminal" refers to a "cellular phone" at the exclusion of a laptop. See EX2020, ¶¶27-28.

With regard to the invention in the '417 Patent, a POSITA would understand separate considerations for enhancing processing speeds and reducing battery consumption in cellular phones versus in laptop computers. EX2020, ¶29. For example, cellular phones of the relevant time period had fundamentally different power management architectures, form factors, and use patterns compared to laptop computers. *Id.* The '417 Patent's specific teachings—including a condition detector for detecting whether the cellular phone is in a closed or open condition, clock frequency management tied to specific processing such as image decoding, address retrieval, and character conversion, and user-directed clock manipulation—are all directed to the cellular phone context. EX1001, 2:65-3:2, 5:35-38. Petitioner's expert, Dr. Baker, confirmed at deposition that he has never designed a cellular phone, further underscoring the disconnect between his laptop-centric analysis and the cellular-phone invention of the '417 Patent. EX2022, 14:5-9.

The Federal Circuit has held that "when a patent 'repeatedly and consistently'

characterizes a claim term in a particular way, it is proper to interpret the claim term in accordance with that characterization.” *See GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir. 2016); *see also VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1318 (Fed. Cir. 2014); *Aortic Innovations LLC v. Edwards Lifesciences Corp.*, No. 2024-1145, 2025 WL 2999367 at \*6 (Fed. Cir. Oct. 27, 2025); *Ebates Performance Marketing, Inc., D/B/A Rakuten Rewards v. International Business Machines Corporation*, IPR2022-00133, Paper 35 at 15-17 (P.T.A.B. May 24, 2023).

The situation in the ’417 Patent is identical to that in *GPNE* where the Federal Circuit construed “node” to the specific device repeatedly and consistently disclosed in the specification because the patent specification in *GPNE* described a specific device—a “pager” or “paging unit”—over 200 times. Nothing in the *GPNE* specification was “inconsistent with characterizing the [claimed] devices as a type of pager.” *Id.* at 1371. Thus, the Federal Circuit held “that ‘node’ is properly characterized as a ‘pager’” based on the specification’s consistent and repeated description. *Id.*

Petitioners have not identified any basis why *GPNE*’s reasoning should not control. Like the *GPNE* patent, the ’417 Patent repeatedly and consistently describes the claimed apparatus as a “cellular phone” at least forty-six times and does not

disclose any device or system inconsistent with such a cellular phone. Thus, because “the specification **repeatedly and exclusively** uses [cellular phone] to refer to the devices in the patented system,” mobile terminal should be interpreted to reflect the disclosed invention, not a laptop computer system. *GPNE*, 830 F.3d at 1370 (emphasis added); *see also Eon-net LP v. Flagstar Bancorp.*, 653 F.3d 1314, 1322-23 (Fed. Cir. 2011) (construing “document” as limited to “hard copy documents” because the specification repeatedly referred to hard-copy documents more than 100 times).

Petitioners further fail to articulate an accurate contradiction in Patent Owner's infringement contentions, which accuse Galaxy tablets as corresponding to the claimed mobile terminal. Petitioners' own documentation confirms that the accused Galaxy tablets do, in fact, correspond to a cellular phone (rather than a laptop) because, in Samsung's own words, “**it's basically like a big phone!**” These tablets are mobile terminals used to “Make calls and send messages” and connect to LTE and/or Wi-Fi networks to provide cellular phone functionalities. *See* EX2017, 1, 2-3 (<https://www.samsung.com/us/support/answer/ANS10001614/>) (excerpted below and showing in detail how the accused Galaxy tablets are or include cellular phones, *e.g.*, “it's basically like a big phone!”):

## **Make calls and send messages from your Galaxy tablet**

Don't you hate it when your phone starts ringing once you're snuggled up and comfortable in bed? With the Call & text on other devices feature, you can make and receive calls on your tablet as long as it's signed into the same Samsung account as your phone. You can also send messages. However, the connected phone will need to have active service.

### **Call and text differences between LTE and Bluetooth tablets**

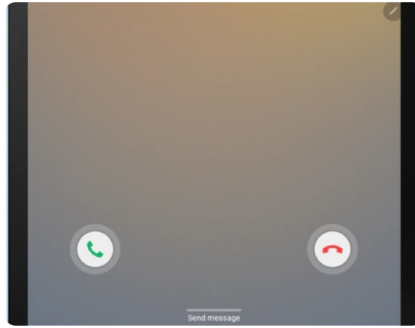
You can send and receive calls and messages on LTE tablets that have an active SIM card or eSIM with active network service. The Call & text on other devices feature allows Bluetooth tablets and LTE tablets without an active network service to make and receive calls and messages when the following conditions are met:

- Connected to a Galaxy phone that has active service
- Connected to a Wi-Fi network
- Signed into the same Samsung account on both devices
- Call & text on other devices is enabled

If you have an LTE tablet with active service and you'd like to learn how to make calls and send messages, please see the sections "Use your tablet during a call" and "Use your tablet for messaging" in this article.

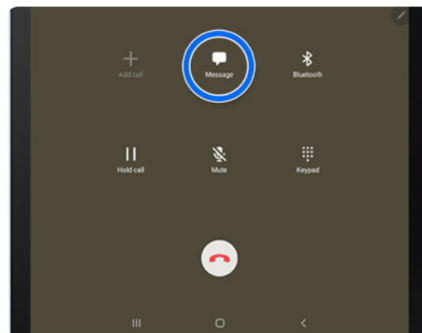
## Use your tablet during a call

It may seem like a high tech idea, but answering forwarded calls on your tablet is simple - it's basically like a big phone!  
When you see an incoming call, simply swipe the green **Phone** icon to pick up the call. Additionally, you can swipe the red **Phone** icon to decline the call, or swipe up from the bottom of the screen to send the caller a message or set a reminder to call them back.  
If you would rather talk on your phone, tap **Pull call** on the phone itself. This will end the call on the tablet and open it up on the phone.

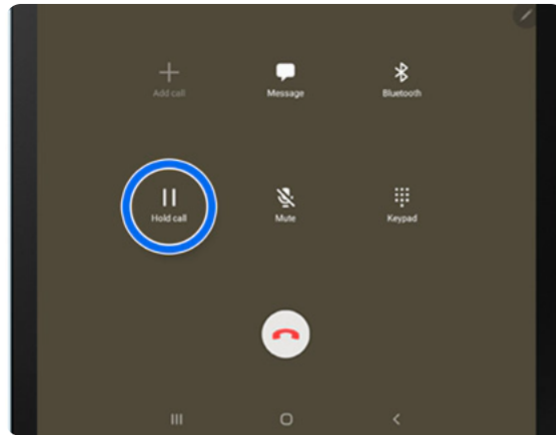


When you answer a call on your tablet, the call interface will look almost identical to the interface on your phone. There are just a few differences, but no worries, it's still very easy to use. Here is what you can do during a forwarded call on your tablet:

- **Add call:** Tap this to add an additional call to the current phone call. This option is only available on LTE tablets.
- **Messages:** Use this to send a text message to the caller. The Messages app will open up; enter and send a text message the way you normally would. To go back to the call, tap the green bar at the top of the screen.



- **Bluetooth:** Enable or disable the tablet's Bluetooth function. This is handy if you want to connect a Bluetooth headset or another audio device to the tablet during a call.
- **Hold call/Resume call:** Tap this to place the phone call on hold or resume the call when you are ready to talk again.



- **Mute:** Temporarily turn off your microphone so the other party won't be able to hear you.
- **Keypad:** Enter a number in the keypad for when you're using an automated phone service or trying to enter a conference call.

Recognizing such an interpretation of the claimed mobile terminal, Patent Owner's infringement contentions do not accuse Petitioners' laptops and limit the scope of the infringing products to consistently interpret the claims in the litigation in District Court and in this IPR proceeding.

In view of the foregoing, the Board should reject Petitioners' overly broad interpretation of the claimed "mobile terminal" that finds no support in the intrinsic record and construe "mobile terminal" as "cellular phone."

### **B. Remaining Terms**

For the remaining terms, Patent Owner simply applies Petitioners' own constructions to show how the Petitioners have not met their burden under 37 CFR

§ 42.104(b)(4). Any statements made herein with respect to the lack of a claim element in a prior art reference are under Petitioners' proposed constructions and should not be construed as an admission on behalf of Patent Owner that such construction is proper under the *Phillips* standard.

## **V. LEGAL STANDARD**

A claim is not patentable if the differences between the claim and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention. 35 U.S.C. § 103(a). Obviousness requires assessing (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) "secondary considerations" of non-obviousness such as "commercial success, long felt but unsolved needs, failure of others, etc." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)).

It is a petitioner's burden "to demonstrate both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" *Intelligent Bio-Systems, Inc. v. Illumina*

*Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016) (quotations and citations omitted). However, a petitioner must first show that all of the claimed elements are disclosed in the prior art. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (considering motivation to combine and reasonable expectation of success only “if all the elements of an invention are found in a combination of prior art references”).

**VI. GROUND 1: PETITIONERS FAIL TO ESTABLISH THAT INDEPENDENT CLAIM 1 WOULD HAVE BEEN OBVIOUS BASED ON BELT IN VIEW OF FOSTER AND/OR NORRIS**

Ground 1 fails because, even if POSITA would have been motivated to combine some combination of Belt, Foster, and Norris, Petitioners have failed to show with particularity how such a combination would render obvious elements [1pre], [1c], or [1d]. As such, Ground 1 fails as to claim 1 and the claims depending therefrom.

**A. Belt, Foster, and Norris Do Not Render Obvious Claim Elements [1pre], [1.c], [1.d], and Claims 2 and 4.**

The Petition relies exclusively on Belt's disclosure of “laptop computer system 10” as meeting each of these claim elements and claims that explicitly recite a “mobile terminal.” For example, [1.pre] recites: “a mobile terminal capable of being changed from an open condition into a closed condition.” However, as

explained above, the claimed “mobile terminal” should be construed as a “cellular phone,” and Belt provides no such disclosure but simply discloses a “laptop computer system 10.” EX2020, ¶37. Indeed, Petitioners or their expert provide no analysis or evidence as to how “laptop computer system 10” of Belt corresponds to the claimed “mobile terminal.” Pet. at 9-10 (citing EX1004, 1:13-17). None whatsoever. As such, the Petition is deficient at the outset. EX2020, ¶¶37-38.

Furthermore, contrary to Petitioners’ unfounded proclamation that “Belt’s computer system is *indisputably* within the scope of the limitation” (Pet. at 10, emphasis added), the Petition puts forth no evidence that Belt’s laptop computer system equates to the claimed mobile terminal as correctly construed as a cellular phone in view of the disclosures in the specification of the ’417 Patent. See Pet. at 9-10. Rather, Petitioners only compare the capability of the devices—namely changing from an open condition to a closed condition—at the exclusion of comparing the devices themselves. See EX2020, ¶37. This analysis is, at best, incomplete because under Petitioners’ logic, *any* device that can be in an open or closed position would meet these claim elements. EX2020, ¶38. However, a proper analysis considers the subject matter “as a whole.” *KSR*, 550 U.S. 398 at 406. Accordingly, independent of Patent Owner’s construction for “mobile terminal,”

Petitioners' failure to articulate a linkage between Belt's laptop computer system and the claimed mobile terminal dooms the Petition in its entirety.

**B. There is No Motivation To Combine Belt and Foster**

A POSITA would not have been motivated to combine the teachings of Belt with those of Foster to arrive at the claimed invention of the '417 Patent, nor would such a combination have rendered the claims of the '417 Patent obvious. EX2020, ¶40. The fundamental differences between the systems, their power management architectures, and their respective approaches to managing device behavior upon lid closure each independently and collectively counsel against such a combination. EX2020, ¶40.

At the outset, it is critical to understand that both Belt and Foster are directed to portable computers—specifically, laptop or notebook-type personal computer systems—and not to cellular phones or mobile terminals of the type claimed in the '417 Patent. *See* EX1004, 1:13-23; EX1005, 1:24-35; EX2020, ¶41. Belt discloses a “notebook” type laptop computer system 10, which includes a main processor 11 implemented with an Intel 386SL, a hard disk drive 23, a floppy disk drive 26, a main memory 24, and numerous other conventional personal computer peripherals. EX1004, 2:43-53; EX2020, ¶41. Foster similarly discloses a conventional portable

computer system of the type commonly referred to as a “laptop” personal computer, which includes a processor 311, a main memory 326, a hard disk drive 323, a floppy disk drive 327, a video controller 318, a modem 322, and other peripheral components not found in a cellular phone. EX1005, 5:45-55; EX2020, ¶41.

The power management concerns and constraints of laptop computers are fundamentally different from those of cellular phones. EX2020, ¶42. Laptop computers must manage power to a wide array of peripheral subsystems—hard disk drives, floppy disk drives, video controllers, modems, LCD backlights, and the like—each with its own power-down and power-up sequences. See EX1004, 2:43-53; EX2020, ¶42. By contrast, the '417 Patent is directed to a cellular phone in which the primary power management challenge is controlling the clock frequency of the central processing unit to balance processing speed against current consumption from a small battery. EX1001, 1:43-52; EX2020, ¶42. A POSITA would have recognized that the vastly different system architectures, use cases, and design constraints of laptop computers compared to cellular phones would have discouraged any attempt to transplant the power management techniques of one type of device into the other. EX2020, ¶42.

The power management method disclosed in Belt is fundamentally

incompatible with the dynamic clock frequency control taught and claimed in the '417 Patent. EX2020, ¶43. Belt's system responds to the closing of the lid by placing the main processor into a "suspend" state—a reduced power mode in which the processor is entirely *halted* and its clock is turned off. See EX1004, 1:64-2:23; EX2020, ¶43. More specifically, Belt discloses that the processor has "a first operational mode in which said processor executes instructions and a second operational mode in which said processor is halted in a reduced power state from which said processor can automatically exit in response to a predetermined condition." [EX1004](#), 2:1-5; EX2020, ¶43. When the lid is closed, the system transitions from the first mode to the second mode; the processor's clock is stopped, power is shut off to most system components via the SYSVCC line, and the system enters a very low power state. See EX1004, 3:62-67, 9:6-17; EX2020, ¶43.

This is a binary, all-or-nothing approach where the processor is either running at its normal operational speed or it is completely halted. See EX1004, 6:45-50, 9:14-17; EX2020, ¶44. Belt does not teach, suggest, or contemplate *adjusting* the frequency of the processor's clock signal in response to the lid being closed while permitting the processor to continue executing instructions. EX2020, ¶44. Nor does Belt teach temporarily increasing the clock frequency to execute specific processing

while the lid remains closed—the very feature claimed in the '417 Patent. EX2020, ¶44. In Belt, once the lid is closed and suspend mode is entered, no processing occurs at all until a resume event (such as opening the lid) restores the processor to its fully operational mode. EX1004, 10:58-68; EX2020, ¶44.

Belt does reference a speed control register 32 and the ability to run the CPU at different clock speeds. *See* EX1004, 3:1-5; EX2020, ¶45. However, this feature is used in a narrow and specific context: when a PMI (Power Management Interrupt) handler routine is invoked, the system *forces* the CPU to its fastest clock speed so that the interrupt routine executes as quickly as possible, and upon completion of the interrupt handler, the original clock speed is restored. *See* EX1004, 8:11-15; EX2020, ¶45. This clock speed manipulation is not related to the open or closed state of the lid, is not used to modulate power consumption during normal operation, and does not constitute dynamic frequency scaling of the kind taught by the '417 Patent. EX2020, ¶45.

Foster likewise fails to teach or suggest modifying the processor's clock frequency in response to the lid being opened or closed. EX2020, ¶46. In Foster, the response to closing the lid is minimal: the system control processor (SCP) merely causes the speaker to beep and deactivates the backlight signal BLON to turn off the

LCD backlight. *See* EX1005, 43:37-42; EX2020, ¶46. Critically, Foster explicitly teaches that “if the lid is closed during system operation the system does not automatically enter standby mode or suspend mode, but instead simply beeps to warn the user that the system is still active, and turns off the backlight for the LCD in order to conserve power.” *Id.* Foster’s system continues to run at whatever clock speed was previously in effect because the lid’s position has no bearing on the processor’s clock frequency. EX2020, ¶46.

Foster does disclose a mechanism for the user to select between a “fast” and “slow” CPU clock speed via hot key combinations. *See* EX1005, 28:11-35. When the user presses the “slow” hot key, the system beeps once and clears the FC (fast clock) flag, and when the user presses the “fast” hot key, the system beeps twice and sets the FC flag. *See id.* However, this clock speed selection is entirely user-driven and is not responsive to any physical state of the device such as the lid being open or closed. EX2020, ¶47. The hot key mechanism is simply a user preference setting, and Foster does not suggest or contemplate any automatic adjustment of processor speed based on the lid’s position. EX2020, ¶47. Furthermore, like Belt, Foster forces the CPU to a fast clock speed during execution of the PMI handler routine, restoring the prior speed only upon exit from the handler. *See* EX1005, 48:22-24. This, too,

has no relationship to the lid's open or closed state. EX2020, ¶47.

The '417 Patent claims a mobile terminal capable of being changed from an open condition into a closed condition, comprising a processor and 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, a second frequency lower than the first frequency when the mobile terminal is in the closed condition, and a frequency higher than the second frequency when specific processing is executed even if the mobile terminal is in the closed condition, with the clock signal returning to the second frequency after the specific processing is completed. EX2020, ¶48.

Neither Belt nor Foster, individually or in combination, teaches or suggests this particular arrangement. EX2020, ¶49. Belt teaches halting the processor entirely upon lid closure—not reducing its clock frequency to a lower operating speed while continuing to process instructions. EX1004, 10:58-61; EX2020, ¶49. Foster teaches continuing operation at the same clock speed when the lid is closed, with no adjustment to the processor frequency whatsoever. EX1005, 43:37-42; EX2020, ¶49. Neither reference teaches the concept of dynamically raising the clock frequency for specific processing while the device remains in the closed condition

and then returning to a lower frequency after the processing is completed, as claimed.

EX2020, ¶49.

Even if one were to assume, *arguendo*, that the teachings of Belt and Foster could theoretically be combined, a POSITA would have lacked motivation to do so. EX2020, ¶50. The two references employ fundamentally different and incompatible approaches to power management upon lid closure. *Id.* Belt teaches complete system suspension—a drastic power-saving measure that halts all processing. *See* EX1004, 1:64-2:23; EX2020, ¶50. Foster teaches a minimal response—a warning beep and backlight deactivation—that does not alter the processor's operational state at all. *See* EX1005, 43:37-42; EX2020, ¶50. A POSITA seeking to improve power management in a cellular phone with a folded structure would not have looked to either of these laptop computer references, which address a different class of device with different power management requirements, and would not have found in them the teaching of dynamically scaling processor clock frequency as a function of the physical open/closed state of the device. EX2020, ¶50.

Moreover, a POSITA attempting to modify Belt with the teachings of Foster would have arrived at a system that either (a) continues to halt the processor upon lid closure (per Belt's core teaching) while adding a beep and backlight control (per

Foster), or (b) simply beeps and turns off the backlight upon lid closure (per Foster) without any change to the processor's operational state. EX2020, ¶51. In neither scenario would the combination produce the claimed invention of the '417 Patent—a system that reduces the processor's clock frequency to a lower operational speed upon closure while allowing the processor to continue executing instructions, and that temporarily increases the clock frequency for specific processing even while in the closed condition. EX2020, ¶51.

To arrive at the claimed invention by combining Belt and Foster, one would need to: (1) extract from Belt the concept that lid closure should trigger a change in the processor's operational state; (2) discard Belt's teaching that the processor should be completely halted in response to lid closure; (3) import from Foster the concept of variable clock speeds (the fast/slow hot key feature); (4) reconceive this user-driven hot key feature as an automatic response to lid position rather than user input; (5) further add the concept that specific processing should cause a temporary increase in clock frequency even in the closed condition; and (6) transplant all of these reconceived concepts from a laptop computer architecture into a cellular phone. EX2020, ¶52. Each of these steps requires the kind of impermissible hindsight reasoning that the law forbids, and none is suggested by the references

themselves. The combination would amount to a fundamental redesign of both Belt's and Foster's power management architectures, guided not by the teachings of the references but by knowledge of the '417 Patent's claims. EX2020, ¶52.

In summary, a POSITA would not have been motivated to combine Belt and Foster to arrive at the claimed invention of the '417 Patent. The references teach different types of devices, employ fundamentally different power management methods, and neither individually nor collectively teaches or suggests the dynamic clock frequency scaling based on the open or closed condition of a mobile terminal that is claimed in the '417 Patent. Any attempt to combine the two references to reach the claimed invention would require impermissible hindsight and a wholesale reconception of the references' teachings. EX2020, ¶53.

**C. Belt, Foster, and Norris Do Not Render Obvious Claim Element [1c]**

The Petition fails to demonstrate that Belt in view of Foster<sup>2</sup> discloses “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

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<sup>2</sup> Petitioners do not rely on Norris for limitation [1c]. See Pet. at 17.

than the first frequency when the mobile terminal is in the closed condition,” as claimed.

Initially, Petitioners rely on Belt alone, referring to Belt's disclosure of a laptop computer system movable between open and closed positions and a lid switch that indicates whether the lid is open or closed. *See* Pet. at 17. Belt, however, merely seeks to “provide an arrangement for causing a system to enter and subsequently exit suspend mode in response to closing and subsequent opening of a lid.” EX1004, 1:58-61. In other words, Belt limits its description to entering into and exiting from suspend mode, with no mention whatsoever of performing any kind of processing while in that suspend mode. EX2020, ¶55. Belt specifically mentions “an Intel 386SL” processor as carrying out its functions. EX1004, 2:53-56. A POSITA would understand that at the time of the invention of Belt or the '417 Patent that the de facto power management mechanism defined by Intel and Microsoft for personal computers using chips such as the Intel 386SL would include the functionalities as described, for example, in the Advanced Configuration and Power Interface Specification Revision 1.0 (“ACPI,” EX2023).

Even if Petitioners' interpretation of reading a “mobile terminal” on a PC is considered, Petitioners completely ignore the substance of the de facto power

management mechanism implemented in PCs at the relevant time by Intel and Microsoft, and instead repeatedly assert, as if the prior art disclosed the claims of the '417 Patent. This is erroneous. EX2020, ¶¶55-56. For example, ACPI expresses the de facto power management mechanism for PCs with states S0, S1, S2, S3, S4, and S5.<sup>3</sup> EX2023, 155-157; EX2020, ¶56. Among these, S1 through S5 are all defined as sleep states in which the clock is stopped and the “processors are not executing instructions.” EX2023, 155-157; EX2020, ¶56. S0 is the “working” state where the clock is on and instructions are executed. EX2023, 155; EX2020, ¶56. Thus, a POSITA would understand that Belt's scenarios align with the working or sleep states known at the time. EX2020, ¶57.

Regarding the specific language of element [1c], the Petition relies on the second and third of three scenarios set forth by Belt in response to determining that the lid of the laptop computer system is closed. *See* Pet. at 18. In the second scenario, Belt will turn off the backlight without stopping the system from operating when the lid is closed. EX1004, 6:45-50. In the third scenario, Belt provides an audible

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<sup>3</sup> Advanced Configuration and Power Interface Specification Revision 2.0 (EX2024), released July 27, 2000, includes a similar description of states S0, S1, S2, S3, S4, and S5, demonstrating that a POSITA at the time of the '417 Patent would have the same understanding as that at the time of Belt. EX2020, ¶56.

feedback in addition to turning off the backlight when the lid is closed. *Id.*

Absent from either scenario is a linkage between the frequency of the clock signal and turning off the backlight. EX2020, ¶58. For example, Figure 2 provides a flowchart of the operation program in Belt based on the status of the lid. Nothing in Figure 2 or the related explanation in the specification describes manipulating the speed of the clock based on the status of the lid or the backlight. EX2020, ¶59. Instead, Belt either enters suspend mode or turns off the backlight in response to the lid closing. *See* EX1004, Fig. 2; EX2020, ¶57. Thus, the Petition cannot associate “suspend mode” with the second frequency because the clock is turned off, and thus there is no clock. EX1004, 10:59-61. Petitioner's expert confirmed this gap in the disclosure of Belt at deposition, agreeing that “If there is no clock, there is no clock frequency.” EX2022, 23:18-19. This testimony confirmed that when the clock is off or “0,” then this does not correspond to the claimed second frequency.

This understanding comports with the limited functionality described in Belt. For example, Belt's scenarios either place the device in a “suspend mode” that “place[s] the main processor 11 in a low power mode in which **its clock is turned off** and program execution is halted” (EX1004, 10:59-61 (emphasis added)) or merely turn off the backlight without stopping the system from operating when the

lid is closed. EX1004, 6:45-50. In the first scenario, there is no clock speed to correspond to the claimed “second frequency.” Dr. Baker agrees. EX2022, 23:18-19. Again, Belt does not describe manipulating the speed of the clock based on the status of the lid or the backlight. And when pressed, Dr. Baker could not identify any passage in Belt that specifically ties a reduction in clock frequency to the act of closing the lid under those non-suspend options. EX2022, 31:23-33:1. Nor does the Petition argue that such configuration is inherent.

This further aligns with the power management states described in ACPI. *See* EX2023; EX2020, ¶56. For example, Belt describes a system in a full execution state (*i.e.*, S0) or a state where program execution is halted (*i.e.*, any of S1-S5). EX2023, 155-157; EX2020, ¶56.

In Belt's second scenario, there is no indication by Belt that the clock speed is slowed. By Petitioners' own logic “continuing system operations” does not correlate with a decrease in clock speed. EX2020, ¶¶59-60. For example, regarding claim 2, Petitioners argue that the computer system in Belt (and Foster) can be connected to an external keyboard, mouse, and display. Pet. at 28 (citing EX1004, 4:57-64). Accordingly, rather than reducing processing speeds when the lid was closed, the system in Belt would “turn off the backlight without stopping the system

from operating” (EX1004, 6:45-50) because the processor in Belt would be used in conjunction with the external elements and would require the clock speed to be maintained to support such external elements. EX2020, ¶61. Indeed, any discussion of changing clock speed in Belt is related to *increasing* clock speed to execute a routine “as fast as possible” before “the main processor restores to register 32 the clock speed which was in effect when the PMI occurred.” EX1004, 7:68-8:2, 8:11-15; EX2020, ¶62. This temporary boost in clock speed occurs during system operation when the status of the lid is open. See EX1004, Fig. 4. Therefore, Belt does not disclose “control[ing] the frequency of the clock signal so as to become a first frequency when the mobile terminal is in the open condition, and control[ing] 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.” EX2020, ¶62.

Further, the single paragraph of Dr. R. Jacob Baker’s declaration provided in support of Petitioners’ assertions simply parrots the language of the Petition, without more, in violation of 37 C.F.R. § 42.104(b)(4). EX1003, ¶76. The Board has found such arguments and mirrored expert testimony as “too conclusory to persuade us that Petitioner has met its burden at this stage of the case.” *InfoBionic, Inc. v. Braemar Manufacturing, LLC*, IPR2015-01704, Paper 11 at 14-15 (P.T.A.B. Feb. 16, 2016);

*see also Kinetic Techs., Inc. v. Skyworks Solutions, Inc.*, IPR2014-00529, Paper 8, 15-16 (P.T.A.B. Sept. 23, 2014) (“Merely repeating an argument from the Petition in the declaration of a proposed expert does not give that argument enhanced probative value,” and a petitioner cannot move forward to trial based upon such “mere conclusory statements.”) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Accordingly, the testimony of Dr. Baker should be given little (if any) weight.

With no disclosure in Belt, the Petitioners turn to the combination of Belt and Foster. In this alternative theory, the Petition relies on Belt's disclosure of a “first operation mode” and “a second operation mode.” Pet. at 20 (citing EX1004, 1:64-2:9). The second operation mode is described as a suspend mode that “place[s] the main processor 11 in a low power mode in which **its clock is turned off** and program execution is halted.” EX1004, 10:59-61 (emphasis added). There is no explanation that turning the clock “off” and halting program execution corresponds to the claimed “second frequency lower than the first frequency.” *Id.* Indeed, “If there is no clock, there is no clock frequency.” EX2022, 23:18-19. As Petitioner's expert confirmed, when a clock is not operating, then there is no frequency. The plain and ordinary meaning of the claim requires there to be two different levels of frequencies

and two different values where the second frequency is lower than the first frequency. *See, e.g.*, EX1001, Fig. 5 (“low frequency” and “high frequency”). The plain and ordinary meaning does not encompass a situation where the device is completely off and the clock is not operating at all, as that would be contrary to the teachings of the ’417 Patent. *Id.*

Nor does the combination of Belt and Foster disclose this element. For example, the Petition points to “an idle mode” in Foster in which “the CPU clock is slowed significantly.” Pet. at 20. However, Foster does not tie its idle mode to lid closure. EX2020, ¶64. Dr. Baker conceded this point at deposition, testifying only that it was “reasonable to say that it could” be triggered by lid closure—which is speculation and hindsight, not a disclosure or motivation in the art. EX2022, 28:34-29:10. Moreover, substituting Foster’s idle mode for Belt’s suspend mode upon lid closure would undermine Belt’s entire design purpose. EX2020, ¶64. Belt’s invention is titled “System Suspend on Lid Close and System Resume on Lid Open,” and its core teaching is to maximize power savings by halting the processor entirely when the lid is closed. EX1004, Abstract; EX2020, ¶64. Indeed, Belt’s solution is “a low power mode in which the clock is turned off and program execution is halted.” EX1004, 10:58-61. Dr. Baker agreed that “shutting something off will use

less power than if something is on, even if that thing that's on is running at a very low frequency as taught in Foster." EX2022, 28:19-22. A POSITA would therefore have no reason to adopt the *less* power-efficient idle mode in place of Belt's suspend mode when Belt's specific goal is maximum power conservation upon lid closure. EX2020, ¶64. The Petitioners only offer conclusory statements parroted by their expert in violation of 37 C.F.R. § 42.104(b)(4). Pet. at 21-23 (citing EX1003, ¶¶83-86). Again, this mere copy-paste falls short of Petitioners' burden. *See InfoBionic*, IPR2015-01704, Paper 11 at 14-15, citing 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Accordingly, the Petition has failed to demonstrate that Belt or the Belt-Foster combination renders element [1c] unpatentable.

**D. Belt, Foster, and Norris Do Not Render Obvious Claim Element [1d]**

Irrespective of the faults with respect to element [1c], Petitioners further fail to meet their burden for element [1d]. Claim [1d] builds on the capabilities of the claimed mobile terminal, further requiring that "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.”

Here, Petitioners initially attempt to rely on Belt alone, citing to Belt’s computer system running at a low clock frequency, referring back to the Petition’s analysis for element [1c].<sup>4</sup> Pet. at 23. However, the Petition does not include a discussion of “user configured operational closed-lid mode with lower clock frequency” and the basis of the analysis for element [1d] in the Petition is absent, and therefore, incomplete. *See* Pet. at 24.

Furthermore, the analysis provided in the Petition for element [1d] is divorced from the disclosures relied upon for element [1c], failing to acknowledge the related functionality between the two elements. For example, where element [1c] covers clock frequencies corresponding to an open or closed condition, element [1d] covers a further scenario “even if the mobile terminal is in the closed condition.” EX2020, ¶67. In contrast, the disclosures from the prior art cited in the Petition do not (1) align with the scenarios described in the Petition for element [1c] and (2) do not

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<sup>4</sup> The Petition cites back to “limitation 1[d], §VI.A.4.” Pet. at 23. Dr. Baker confirmed that a similar typo in his declaration should refer to limitation 1[c], corresponding with §VI.A.4.

disclose the functionality claimed in element [1d]. *Id.*

Regarding the first flaw, the Petition cites to Belt's turning off a backlight or a suspend mode for the claimed "second frequency lower than the first frequency when the mobile terminal is in the closed condition." See Pet. at 18, 19-20. Now, for element [1d] the Petition would rely on Belt's discussion of a power management interrupt (PMI). Such a combination is incongruent. EX2020, ¶72. For example, Petitioners cite to a PMI, resulting in the processor in Belt "forc[ing] the CPU to run at its fastest speed." Pet. at 23 (citing EX1004, 7:67-8:2). However, nothing in Belt supports such an increase "even if the mobile terminal is in the closed condition" because, as argued with respect to element [1c], "a POSTIA would have further understood that when the lid to Belt's laptop computer system 10 is closed, higher processing speeds **are not critical** because the system would not be in active use." Pet at 18 (emphasis added). Critically, Dr. Baker was unable to identify any Belt example of specific processing that would increase clock frequency while the lid is closed, candidly conceding: "I don't recall Belt giving those examples." EX2022, 38:15-16. He instead retreated to what a POSITA "would certainly understand"—which is not a disclosure in the prior art. EX2022, 38:17-20. To argue that it would be obvious to a POSITA greatly exaggerates the teachings of Belt. Belt teaches a

system that is either suspends all program execution (suspend mode) or maintains system operations (*see* EX1004, 6:45-50; EX2020, ¶¶57-59), not a middle ground solution of a lower, non-zero clock speed.

Further, Belt describes only two scenarios of either turning off the clock or “turn off the backlight without stopping the system from operating” (EX1004, 6:45-50). In the first scenario, when the device is in suspend mode there would be no software executing to generate the PMI to adjust the speed of the processor in response to the workload because “program execution is halted” until the lid is opened again. EX1004, 10:59-68 (“The processor remains in this mode until an event occurs which is intended to cause it to resume operation. In particular, **if the lid is opened**, the lid switch 68 will .... Cause the resume control circuit 41 to produce a resume reset...”); EX2020, ¶72. Thus, there is no PMI generated by the software (*i.e.*, the claimed “special processing”) that is handled even if the mobile terminal is in the closed condition. EX2020, ¶¶72-73.

Additionally, Belt's PMI handler is fundamentally different from the “specific processing” contemplated by the claims. EX2020, ¶74. Belt's PMI is a system-level power management interrupt—a brief hardware-triggered routine that the operating system uses to manage power states (*e.g.*, checking suspend/resume flags, saving

register states). EX1004, 7:50–8:15; EX2020, ¶74. It is not a user-responsive application-level task. EX2020, ¶74. In contrast, the '417 Patent's "specific processing" encompasses tasks such as image decoding, address retrieval, and character conversion—application-level processing that directly responds to user input and has "an effect on a response to a request from the user." EX1001, 5:35–38, claim 2. A POSITA would not equate Belt's brief system management routine with the claimed specific processing that triggers a sustained clock frequency increase to serve user-facing tasks because this occurs while the lid is open. EX2020, ¶74. Petitioners offer no explanation for how or why a hardware power management interrupt constitutes the type of user-responsive processing that the claims require.

As a result, Belt does not disclose a frequency higher than the second frequency when a specific processing is executed **even if the mobile terminal is in the closed condition**. EX2020, ¶¶73, 79. Rather, Belt describes running the CPU at its fastest speed for a short time. See EX1004, 7:67-8:2. This short time occurs when the device is in the open condition because "the first thing the PMI handler does is to check the resume flag 44 (FIG. 1) in the processor 11 in order to see whether the processor 11 is in the process of resuming **from a suspended state**." EX1004, 7:56-60 (emphasis added); EX2020, ¶72. In a suspend state, "the main processor 11 is in

a lower power mode in which the clock is turned off and program execution is halted.” EX1004, 10:58-61; EX2020, ¶72. Belt discloses a separate “resume handler” that “**if the lid is opened**, the lid switch 68 will, through the signal processing circuit 13, cause the resume control circuit 41 to produce a resume reset.” *Id.*, 10:63-66 (emphasis added); EX2020, ¶72. In contrast, if it is “determined that the lid is now closed, [] therefore the resume sequence will be terminated and at block 184 the system will return to the suspend mode in order to wait for a further resume reset **caused by subsequent raising of the lid.**” *Id.*, 11:39-44 (emphasis added); EX2020, ¶72. Thus, even if an incoming telephone call could be an interrupt while Belt is in suspend mode with the lid closed, Belt expressly teaches that the system “return[s] to the suspend mode”—*i.e.*, the clock turns off entirely—rather than returning to a “second frequency” as the claims require. EX1004, 11:14-28; EX2020, ¶69. As Dr. Baker conceded, if the clock is stopped, there is no clock frequency. EX2022, 23:18-19. Accordingly, Belt does not describe increasing the clock speed while still in a closed condition and then returning to a second frequency, and the Petition offers no explanation regarding this point for claim 1. EX2020, ¶70.

Moreover, the ACPI framework discussed above with respect to limitation [1c] is equally fatal to Petitioners’ [1d] theory. As explained, the de facto power

management mechanism for PCs defined by Intel and Microsoft provides that in any suspend state (S1–S5), processors are “not executing instructions” and the clock is stopped. EX2023, 155-157; EX2020, ¶71. Under this framework, there is no mechanism for a sleeping or suspended PC to transiently raise its clock frequency to execute a “specific processing” and then return to a lower running frequency. EX2020, ¶71. The only path from suspend to execution in ACPI is a full system resume to the S0 (working) state. *Id.* This is the antithesis of the claim’s requirement that the frequency increase occurs “even if the mobile terminal is in the closed condition.” Belt’s architecture, built on the Intel 386SL processor and following the well understood power management states, inherits these constraints. EX2020, ¶71. Thus, a POSITA would understand that there is no technical basis in Belt’s PC architecture to increase the clock frequency for the claimed “special processing” and subsequently decrease to the previous, lower clock frequency. EX2020, ¶71.

The combination of Belt and Foster also falls short. *See* EX2020, ¶75. Petitioners offer no explanation that the interrupt of Foster would occur when “even if the mobile terminal is in the closed condition,” as claimed. *See* Pet. at 24-25. Instead, Petitioners seek support in their deficient expert declaration. *Id.* (citing EX1003, ¶92-94). However, such conclusory and superficial attorney argument in

the guise of expert testimony cannot serve as sufficient support for Petitioners' arguments. *See, e.g., TRW Auto. US LLC v. Magna Elecs., Inc.*, IPR2014-00258, Paper 18, 10-11 (P.T.A.B. Aug. 27, 2014) (giving little to no weight to expert testimony that "did not elaborate on [Petitioner's] position because it simply repeated [Petitioner's] conclusory statements verbatim"); *see also InfoBionic, Inc. v. Braemar Mfg., LLC*, IPR2015-01704, Paper 11, 6 (P.T.A.B. Feb. 16, 2016) (denying institution because expert merely repeated the argument in the Petition about what a reference meant without explaining why the expert believed that meaning to be correct). Therefore, the expert's unsupported assertion cannot fill the hole in the Petition.

Petitioners further rely on Foster to cure Belt's suspend behavior by mapping Foster's "incoming characters from a serial line or telephone line" processing to the "specific processing," arguing the system would raise frequency to avoid losing data and then return to idle. Pet. at 25-26. But this is the same substitution that conflicts with Belt's design and, again, presupposes replacing Belt's behavior for suspending or continuing operations with Foster's described return to idle when the lid is raised. EX2020, ¶75. The rationale is hindsight-driven, not supported by Belt's teachings, and fails to account for Belt's explicit return-to-suspend-when-lid-still-closed logic.

EX2020, ¶75.

Accordingly, the Petition has failed to demonstrate that Belt or the Belt-Foster combination renders element [1d] unpatentable.

**E. Belt, Foster, and Norris Do Not Render Obvious Claims 2 and 4-7.**

Claims 2 and 4-7 all depend from an independent claim for which Petitioners have failed to show that the Belt-Foster-Norris combination renders the independent claim unpatentable. Thus, for the same reasons, claims 2 and 4-7 are not rendered unpatentable by the Belt-Foster-Norris combination.

**VII. GROUND 2: PETITIONERS FAIL TO ESTABLISH THAT CLAIM 3 WOULD HAVE BEEN OBVIOUS BASED ON BELT IN VIEW OF FOSTER, NORRIS AND/OR ALBERTH**

Ground 2 fails because it is directed solely to dependent claim 3, which requires that “the specific processing is an image decoding processing or an address retrieval processing or a character conversion processing.” For the reasons expressed above with respect to Ground 1, Petitioners have not met their burden to show that elements [1pre], [1c], and [1d] are rendered unpatentable by the Belt-Foster-Norris combination. Thus, Ground 2 fails at least due to the reasons discussed with respect to independent claim 1 in Ground 1.

Moreover, even if the Board were to reach the merits of claim 3, the four-

reference combination of Belt, Foster, Norris, and Alberth lacks a coherent, non-hindsight motivation. Petitioners attempt to equate claim 3's "address retrieval processing" with Alberth's "smart call indication" technique—a caller ID feature from a closeable cellular telephone—by grafting it onto Belt's laptop computer system. Pet. at 42-46. This mapping requires combining four disparate references from different fields—laptop power management (Belt), laptop processor architecture (Foster), desktop/laptop performance management (Norris), and cellular telephone call handling (Alberth)—without a principled reason beyond hindsight to do so.

Additionally, even under Petitioners' proposed combination, the fundamental deficiency remains: Belt's closed-condition path does not implement the transient frequency-raise-and-return behavior required by limitation [1d]. When Belt receives an incoming call while in suspend mode with the lid closed, Belt expressly teaches that the system checks lid state and, if still closed, "return[s] to the suspend mode"—*i.e.*, the clock turns off entirely. EX1004, 11:14-28. Layering Alberth's caller ID functionality onto this architecture does not cure the absence of the claimed behavior of raising the clock frequency for specific processing in the closed condition and then returning to a second frequency upon completion. Accordingly, Ground 2 fails

for this additional reason.

### **VIII. DR. BAKER'S DEPOSITION TESTIMONY CONFIRMS THE PETITION'S DEFICIENCIES**

The deposition of Petitioners' expert, Dr. R. Jacob Baker, confirms the gaps in the Petition. First, Dr. Baker has never designed a cellular phone, undermining his opinions about an invention directed to cellular phone power management. EX2022, 14:5-14. Second, and most significantly, Dr. Baker's testimony reveals that the Petition's theories rest on what a POSITA "would understand" or "could" do, rather than what the cited references actually teach.

Regarding limitation [1c], Dr. Baker admitted that if the clock is stopped in suspend mode, "there is no clock frequency" (EX2022, 23:16-24), that the only difference between Belt's Options 2 and 3 is the audible beep with no other functional or performance differences (EX2022, 25:20-26:5), and that he could not identify a passage in Belt tying clock frequency reduction to lid closure under those options (EX2022, 31:23-33:1). Regarding Foster's idle mode, he conceded it is only "reasonable to say that it could" be triggered by lid closure (EX2022, 28:34-29:10). This is merely his own speculation, not a teaching grounded in any reference. EX2020, ¶76. He further agreed that shutting the system off uses less power than keeping it on even at a very low frequency, confirming that substituting Foster's idle

mode for Belt's suspend mode would undermine Belt's design purpose. EX2022, 28:18-22.

Regarding limitation [1d], Dr. Baker could not identify any Belt examples of specific processing that would increase clock frequency while the lid is closed, stating: "I don't recall Belt giving those examples." EX2022, 38:9-16. When asked to justify the Petition's desired closed-condition behaviors, he characterized the analysis as a "design choice" that a POSITA "would understand that you could make different choices do different things" (EX2022, 43:13-18)—precisely the kind of hindsight-driven reasoning that cannot substitute for teachings in the references. EX2020, ¶78.

## **IX. CONCLUSION**

For at least the foregoing reasons, the Board should confirm the patentability of claims 1-7 of the '417 Patent. The intrinsic record confines "mobile terminal" to a cellular phone, defeating Petitioners' laptop-based grounds at the onset. Even under Petitioners' broader construction, the cited art fails to teach or render obvious limitations [1c] and [1d], and Petitioners' proposed modifications undermine Belt's core power-conservation design while relying on conjecture about what a POSITA "could" do rather than what the art taught. The prosecution history confirms that the

closed-condition specific processing frequency control was the exact feature that distinguished the invention over the prior art. Dr. Baker's deposition admissions further confirm the Petition's deficiencies. The Board should confirm all challenged claims.

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Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on this 5th day of May, 2026, a copy of the attached  
PATENT OWNER'S RESPONSE TO PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NO. 7,577,417, together with all exhibits was served by electronic  
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Respectfully submitted,

Date: May 5, 2026

By:

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**CERTIFICATION PURSUANT TO 37 C.F.R. § 42.24(d)**

Pursuant to 37 CFR §42.24(d), the undersigned certifies that this Response and complies with the type-volume limitation of 37 CFR §42.24(a). The word count application of the word processing program used to prepare this Response indicates that the Response contains 9,716 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a).

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