IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION

PANTECH CORPORATION and PANTECH WIRELESS, LLC Plaintiffs, v. LG ELECTRONICS INC. AND LG ELECTRONICS U.S.A., INC., Defendant.	Case No. 5:22-cv-00113-RWS **JURY TRIAL DEMANDED**

CLAIM CONSTRUCTION EXPERT REPORT OF CHARLES MARUO CHFP CONCERNING CERTAIN TERMS OF U.S. PATENT NOS. 7,283,839 AND 9,575,631

I hereby declare under the penalty of perjury under the laws of the United States of America that the opinions set forth herein are true and accurate to the best of my knowledge, information, and belief.

Dated: June 23, 2023

Charles Mauro CHFP

LG Elecs. Ex. 1032
LG Elecs. v. Pantech Corp.
IPR2023-01268 Page 1

TABLE OF CONTENTS

IN THE UNITED STATES DISTRICT COURT ..... **i**

FOR THE EASTERN DISTRICT OF TEXAS ..... **i**

TEXARKANA DIVISION ..... **i**

I. INTRODUCTION ..... **- 1 -**

II. BACKGROUND AND QUALIFICATIONS ..... **- 1 -**

III. UNDERSTANDING OF LEGAL STANDARDS ..... **- 5 -**

A. Claim Construction ..... - 5 -

B. Indefiniteness ..... - 6 -

IV. MATERIALS CONSIDERED ..... **- 6 -**

V. DEFINITION OF A PERSON OF ORDINARY SKILL IN THE ART FOR BOTH PATENTS-AT-ISSUE ..... **- 7 -**

VI. TECHINCAL BACKGROUND FOR EACH OF THE PATENTS-AT-ISSUE ..... **- 7 -**

A. U.S. Patent No. 7,283,839 ..... - 7 -

B. U.S. Patent No. 9,575,631 ..... - 8 -

VII. THE '839 PATENT ..... **- 9 -**

A. "description data" ..... - 9 -

VIII. THE '631 PATENT ..... **- 13 -**

A. "sequentially displaying icons" / "performing sequential display of icons" ..... - 13 -

B. "displaying one icon in a designated portion of a display" ..... - 15 -

C. "control menu" ..... - 19 -

D. "predetermined function" ..... - 24 -

IX. ABOUT THE REFERENCES IN THIS REPORT ..... **- 27 -**

X. RESERVATION OF RIGHTS ..... **- 27 -**

I. INTRODUCTION

1. I have been asked by Plaintiffs in this lawsuit (Pantech Corporation and Pantech Wireless LLC) (collectively, "Pantech") to provide my opinion as to certain claim terms regarding U.S. Patent Nos. 7,283,839 (the "'839 Patent") and 9,575,631 (the "'631 Patent") (collectively, "the Patents-at-Issue"). I have also been asked to provide my understanding of the level of ordinary skill in the art related to these patents, as well as to explain the relevant technical background related to these patents.

2. Although I am being compensated at my usual consulting rate of $700 per hour for my time reviewing materials and preparing this declaration, my opinions expressed here are my own. My compensation is in no way dependent on the outcome of this case or upon the Court accepting my opinions, and I have no other financial interest in this matter or the parties thereto.

3. Depending on new information learned during discovery, or positions taken throughout the case by LGE or its experts, I may edit, add to, or otherwise refine the topics and expected testimony described here. I reserve the right to supplement my opinions based on new information.

4. If called upon to do so, I am prepared to testify before the Court regarding my opinions expressed here. In such a situation, I may rely on live demonstrations, demonstratives, exhibits, or other visual aids to assist in presenting my testimony.

II. BACKGROUND AND QUALIFICATIONS

5. My qualifications to testify about the Patents-at-Issue and the relevant technology, along with a list of all my publications within at least the past ten years and a list of the matters in which I have testified (either at trial or by deposition), are set forth in my curriculum vitae ("CV"), which I have attached here as Appendix A. I will briefly summarize my qualifications to render opinions regarding this technology in the following paragraphs.

6. I have provided expert reports, expert depositions, and testimony over the past 10 years in numerous cases involving many aspects of GUI design and testing.

7. My name is Charles L. Mauro CHFP. For the past 45 years, I have been the President of Mauro Usability Science, Inc. (MUS), a consulting firm based in New York, N.Y. providing graphical user interface (GUI) design and human factors research to leading U.S. and international corporations and government agencies. I am an expert in GUI design and testing. I have conducted GUI research and development programs for the following major corporations: New York Stock Exchange, Goldman Sachs & Company, Citizens Bank, Donaldson, Lufkin & Jenrette, Citibank, Ameritrade, Apple, Department of Defense, Hewlett Packard, Facebook (Meta), Amazon, AT&T, NASA, Microsoft, General Electric, Trading Technologies Inc., Wit Capital/Soundview, Inc. and others. I am named inventor on numerous GUI systems covering U.S. and foreign utility patents. I am a certified Human Factors Engineering Professional and obtained such certification from the Board of Certification in Professional Ergonomics (Certification number 1312). I have GUI design solutions running at the heart of the world economy including design of major trading systems utilized at leading equities and futures exchanges on a global basis. I have personally managed the development of modern mobile GUI designs covering a wide range of application areas including medical, financial services, military, consumer and heavy industrial product categories.

8. I earned a Bachelor of Science Degree in Industrial Design from Art Center College of Design in Los Angeles, having been awarded a full expense scholarship from the Ford Foundation based upon recognized academic excellence. In 1976, I received a master's degree in Ergonomics and Human Factors Engineering from New York University (NYU). While at NYU, I was a National Institute of Occupational Safety and Health research fellow at the Rusk Institute of Rehabilitation Medicine. Prior to founding my own firm, I was employed by the industrial design

firms of Raymond Loewy International and Henry Dreyfus Associates, where I managed many large-scale design projects for national and international clients.

9. Upon being nominated and appointed to the first Presidential Design Awards Committee by the Reagan Administration, I selected projects that qualified for Presidential Design Awards in the category of product design and established the criteria by which designs were selected. I have been chairman of two American National Standards Institute (ANSI) standards committees and has also served on numerous design awards committees, including the Industrial Design Magazine Annual Design Review.

10. I am a member of numerous professional societies including the Association for Computing Machinery, Industrial Designers Society of America, the Human Factors and Ergonomics Society and the Usability Professionals' Association.

11. I have been an invited speaker on GUI design at leading international conferences, government agencies, legal conferences and leading academic institutions including USPTO Design Day, Fordham Intellectual Property Law and Policy Conference, Federal Judicial Center and Berkeley Center for Law and Technology Intellectual Property Seminar, MIT Sloan School of Management, Stanford University Law School, University of Pennsylvania, and others. I have been an invited speaker at the USPTO on GUI design and human computer interaction frameworks including sessions on mobile GUI design.

12. I have been quoted in leading business publications including The New York Times, The Wall Street Journal, Business Week, Fortune, Science, Scientific American and other publications. I received leading awards for both GUI design and human factors/ergonomics research. I have received the Alexander C. Williams award from the Human Factors Society for outstanding

contributions made to a major operational man-machine system. I have also received major awards and citations from NASA and the Association of Computing Machines for GUI design solutions.

13. My experience covers in-depth working knowledge of both formal usability science and detailed GUI design for a broad range of software and hardware systems spanning commercial and consumer applications. Additionally, my professional background covers new product development and GUI design methodologies related to overall product development life-cycle optimization, feature and function definition, consumer testing and human factors engineering. I also have a working knowledge of primary issues related to economic modeling of new product features/functions and their implications for high level market timing.

14. Over the past 45 years I have been closely involved in the progressive development of primary human computer interaction frameworks involving GUI design, user testing and human factors research for mobile devices. I have been intimately involved in the research, design and user testing of a wide range of mobile hand-held systems including portable data terminals, cellphones, smartphones, tablets and wrist-mounted products.

15. I have been retained by leading law firms and corporations as an expert resource on Ergonomics / Human Factors Engineering (CHFP) focusing on GUI design, consumer decision making, usability engineering, usability testing, product design and development and industrial design. I have been an invited speaker at leading law conferences including sessions before federal judges focusing on product development and human computer interaction design and the provision of expert testimony methods and processes.

III. UNDERSTANDING OF LEGAL STANDARDS

16. I am not a lawyer and am not offering any opinions regarding legal matters. However, the legal principles relevant to my opinion herein have been explained to me by Pantech's counsel. In this section, I summarize these legal principles as they have been explained to me.

17. I reserve the right to change or formulate new opinions in the event there is a change in the law concerning my opinions provided in this report.

A. Claim Construction

18. I understand that the claim construction exercise begins with the language of the claims themselves, and that the general rule is that claim terms are given their plain and ordinary meaning to a person of ordinary skill in the art, in view of the specification of the patent, at the time of the invention. I also understand that the intrinsic evidence (*i.e.*, the claims, the written description including the figures, and prosecution history) are the primary sources used in interpreting claim language.

19. I understand that if disputed claim language is clear on its face, the intrinsic evidence should be consulted to determine whether some deviation from the ordinary meaning of the claim language is warranted.

20. When the disputed claim language is not clear on its face, I understand that the intrinsic evidence should be used to resolve, if possible, any lack of clarity. I also understand that the specification is the best evidence of what the patentee intended the term to mean when there is no clear meaning of a claim term, and that the prosecution history may also shed light on the meaning of ambiguous terms. However, I understand that it is improper to import limitations from the specification into a patent claim through claim construction.

21. I have been informed that sometimes the ordinary meaning of claim language as understood by a person of ordinary skill in the art may be readily apparent even to lay persons. I understand that claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.

B. Indefiniteness

22. Patent claims are indefinite if they do not inform those skilled in the art about the scope of the invention with reasonably certainty. I understand that "reasonable certainty" does not require absolute or mathematical precision. One circumstance in which claims are indefinite is where the claims, as properly construed, are nonsensical. Another circumstance in which claims are indefinite is where the claims, as properly construed, require a specific measurement or calculation but more than one measurement method may be used and no guidance has been provided.

23. I understand that a claim may be indefinite if a term does not have proper antecedent basis, but only if such a basis is not otherwise present by implication or the meaning is not reasonably ascertainable. In other words, a claim is indefinite for lack of an antecedent basis for a term only if one skilled in the art could not determine the bounds of the claims as a result of that lack of antecedent basis, *i.e.*, the claims are insolubly ambiguous.

24. I understand that a party alleging indefiniteness must show indefiniteness by clear and convincing evidence.

IV. MATERIALS CONSIDERED

25. I considered the following materials at the time I formed my opinions presented herein. I have considered each of the Patents-at-Issue and their file histories. I have considered Pantech's initial infringement contentions for each of the Patents-at-Issue, which I assisted to create. I have

also considered each of the parties' claim construction positions and the extrinsic evidence set forth by the parties, which I cite to as applicable within my report.

26. I have also relied upon my extensive experience in the fields of the Patents-at-Issue, as set forth above.

V. DEFINITION OF A PERSON OF ORDINARY SKILL IN THE ART FOR BOTH PATENTS-AT-ISSUE

27. Both of the Patents-at-Issue involve the design and development of a modern mobile graphical user interface (GUI) that embodies a series of core human factors engineering the human computer interaction features and functions. To understand the claims asserted by Pantech in this matter a person of ordinary skill in the art would be an individual with either undergraduate or graduate level education in human factors engineering theory and practice with specific training in human computer interaction design for modern mobile devices including wireless communications terminals. They should have a minimum of one year of industry experience in the design and user testing of modern mobile GUI systems and have designed production modern mobile GUI utilizing common screen design interaction elements.

VI. TECHINCAL BACKGROUND FOR EACH OF THE PATENTS-AT-ISSUE

A. U.S. Patent No. 7,283,839

28. The '839 Patent is entitled "Wireless Communicating Terminal for Providing Integrated Messaging Service and Method Thereof." The '839 Patent generally relates to a wireless communication terminal and method for transmitting and receiving various kinds of messages by using an integrated messaging service program. '893 Patent at 1:8-15.

29. At the time of the '839 Patent (which claims priority to April 14, 2004), conventional message services provided different interfaces for text messages and multimedia messages. In some instances, a user would need to access separate applications for text and multimedia

applications. Further, conventional wireless communication terminals managed incoming and outgoing messages using an in-box and an out-box, analogizing the messages to a traditional letter. This approach provides a late response in comparison to an Internet messenger. *See* '839 Patent at 1:32-50.

30. The '839 Patent solved this problem by providing an integrated messaging service. In one example, the integrated messaging service receives message content and a menu selecting signal in the integrated user interface. The integrated user interface also displays the message content and description data. The wireless communication terminal determines the kind of message to be transmitted which is inputted into the integrated user interface, generates an outgoing message which includes identification data corresponding to the message kind, and transmitting the outgoing message. The integrated user interface displays the outgoing message content and the description data.

31. The wireless communication terminal also determines a message kind of a received message, divides the message into message content and description data, and displays the message content and the description data in the integrated user interface. *See* '839 Patent at 4:6-5:19, 5:20-62, FIG. 2, FIG. 3. By integrating the user interface of text messages and multimedia messages, the technique provides a single application or service thereby increasing usability and simplicity for the user. *See id*. at 1:32-44. As an additional benefit, the integrated user interface increases speed by avoiding delays due to analogizing messages to letters. *Id.* at 1:45-50.

B. U.S. Patent No. 9,575,631

32. The '631 Patent is entitled "Method for Selecting and Controlling Second Work Process During First Work Process in Multitasking Mobile Terminal." The '631 Patent generally relates to a method for controlling a predetermined function of a second work process during a first work

process in a multitasking mobile terminal that performs the first work process and the second work process. ’631 Patent at 1:23-28.

33. At the time of the ’631 Patent (which claims priority to August 11, 2005), conventional methods for multitasking in a mobile terminal meant that when a user wanted to change from one process to another, the previous process would be terminated. ’631 Patent at 1:6164; FIG. 2. As one example, a user had to terminate a text message creation process in order to control music or audio playback. *Id.* at 2:40-44. Upon returning to the text message creation, the user would be faced with the inconvenience of recreating any progress previously discarded or forced to seek out the incomplete message stored in a temporary mailbox. *Id.* at 2:44-51.

34. The ’631 Patent solved this problem by providing a technique for controlling a predetermined function of a second work process in a multitasking mobile terminal that performs the first work process and the second work process. In one example, an icon is displayed which corresponds to a first work process. If the icon is selected, then a screen for the first work process is displayed. ’631 Patent at 5:40-45. Multiple icons, including an icon corresponding to a second work process, are displayed when a command is received to sequentially display icons. The icon corresponding to the second work process can be selected and a corresponding screen is displayed. From this screen, a control menu can be activated for controlling the first work process and commands can be input for controlling the first work process. *Id.* at 5:50-58.

VII. THE ’839 PATENT

35. It is my understanding that there are two disputes concerning ’839 Patent. My opinions regarding these disputes are set forth below.

A. “description data”

36. I understand that the parties have proposed the following constructions for this term:

Term and Applicable Claims	Pantech Proposed Construction	LGE Proposed Construction
description data / the description data (claim 1) / (claim 2)	Plain and ordinary meaning (*i.e.*, information describing message characteristics, such as a sender/recipient name, a nickname, a telephone number, an icon, thumbnail, snapshot, or the like)	Plain and ordinary meaning / indefinite

37. I have reviewed each of the proposed constructions and considered them in view of the claims, specification (including the figures), and prosecution history of the ’839 Patent, as well as extrinsic evidence.

38. It is my opinion that a person of ordinary skill in the art will understand the plain and ordinary meaning of description data and that no construction is necessary. For example, the specification citations below demonstrate that the words should be given their plain meaning and disclose that the ’839 Patent does not assign a specific meaning to this claim term and uses these words with their well-known meanings.

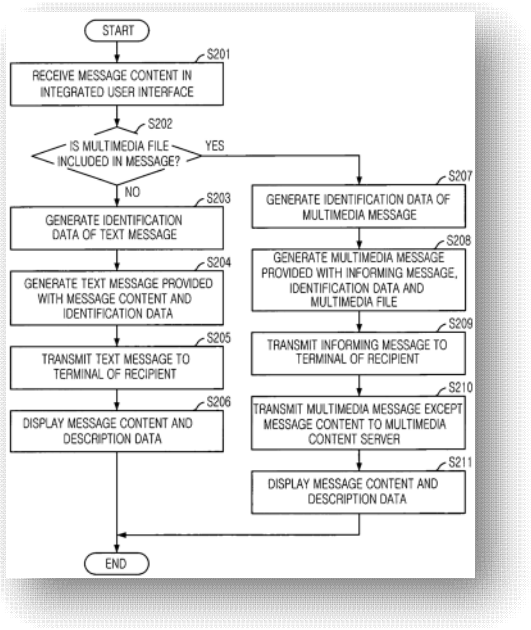
> The message content of the outgoing text message, i.e., the text is transformed into a display form of the IUI and displayed with description data in the IUI at step S206.
>
> The description data present the description of the incoming/outgoing messages in the IUI on the displayer. The description data include incoming/outgoing description data for indicating the incoming message or the outgoing message and file description data, which are applied to only multimedia messages, for indicating a kind of multimedia files such as images, voice and moving images.
>
> For example, the incoming/outgoing description data can be a sender/recipient name, a nickname, a telephone number or an icon, and the incoming/outgoing description data are displayed on a side of the message content. Also, the file description data can be icons,

> thumbnails or snapshots of the moving pictures and the file description data are displayed to inform that the multimedia files are included in the messages.

'839 Patent at 4:46-61.

> The message content is transformed into the display form of the IUI and displayed with the description data, wherein the description data include the outgoing description data and the multimedia file data.

'839 Patent at 5:16-19.



'839 Patent at Fig. 2 (S206, S211).

39. Therefore, a person of ordinary skill in the art would understand that the term "description data" in claim 1 and claim 2 according to its plain and ordinary meaning, *i.e.*, information describing message characteristics, such as a sender/recipient name, a nickname, a telephone number, an icon, thumbnail, snapshot, or the like. In the creation of a mobile GUI design like those described in the '839 Patent, a person of ordinary skill in the art would understand immediately the term "description data." Such data is the initial stimulus provided by the system to a user of the mobile device in the process of understanding the state of the system through the provision of context specific content that can be utilized by the person interacting with the mobile device when

making a critical decision about device status, message intent, second order decision-making and action-taking within the interface. Message "description data" is well understood by a POSITA as the primary means of allowing the user to build an instantaneous mental model of device status, message flow direction and message content all focused on aiding the user in the productive understanding of device status and message-related action-taking.

40. Furthermore, LGE's proposed construction does not contradict this. Rather, LGE alleges that "the description data" in claim 2 is indefinite due to a perceived lack of antecedent basis. However, in my opinion this term is not indefinite. A person of ordinary skill in the art would understand that "description data" includes "incoming/outgoing description data for indicating the incoming message or the outgoing message." '839 Patent at 4:49-51. Additionally, a person of ordinary skill in the art would understand that "the description data" refers to the "description data" first appearing in claim 1. Nor would there be any confusion in understanding a delineation between "incoming description data" and "outgoing description data" in claim 2. Namely, a person of ordinary skill would understand "wherein the description data include incoming/outgoing description data" in claim 2 to refer to "the description data of the outgoing message" (from claim 1) in the case of outgoing messages and the "description data" of the "received message" (from claim 1) in the case of incoming messages. This is clear not only from the claim language itself, but from the corresponding exemplary embodiments described by the specification, which correlates outgoing description data with outgoing messages and vice versa. *See* '839 Patent at 4:47-63.

41. Thus, the term is not indefinite and does not lack an antecedent basis—the claim language easily satisfies the requirement of having a reasonably ascertainable meaning.

VIII. THE ’631 PATENT

42. It is my understanding that there are multiple disputes concerning claim terms of the ’631 Patent. My opinions regarding this dispute are set forth below.

A. “sequentially displaying icons” / “performing sequential display of icons”

43. I understand that the parties have proposed the following constructions for this term:

Term and Applicable Claims	Pantech Proposed Construction	LGE Proposed Construction
“sequentially displaying icons” / “performing sequential display of icons” (claims 1, 8)	Plain and ordinary meaning	“displaying the next icon in place of the prior icon in a sequence”

44. I have reviewed each of the proposed constructions and considered them in view of the claims, specification (including the figures), and prosecution history of the ’631 Patent, as well as extrinsic evidence.

45. In the design and production of modern GUI interfaces for mobile devices it is well understood that “sequentially displaying icons / performing a sequential display of icons” is a fundamental user interface design functional behavior. Icons represent underlying features and functions in a modern mobile GUI interface and are arranged sequentially to improve the utilization of screen space and reduce the cognitive workload of the user of the mobile device. To improve perceptual object detection and rapid interpretation of on-screen information, icons are displayed sequentially in a wide range of graphic screen configurations. The sequential selection of icons in a modern mobile device allows the user to control and manage a range of underlying

functions of the device by sequentially selecting icon elements as the underlying system is running multiple concurrent processes. It is my opinion that a person of ordinary skill in the art will understand the plain and ordinary meaning of these claim terms and that no construction is necessary. For example, the specification citations below demonstrate that the words should be given their plain meaning and disclose that the '631 Patent does not assign a specific meaning to this claim term and uses these words with their well-known meanings.

> A first command of user for selecting the second work process that is concurrently performed together with the first work process of the mobile terminal is inputted through the user interface 50 to the second work process selecting unit 60. The second work process selecting unit 60 includes an icon activating unit 62 and a selecting unit 64. Every when the first command of user is inputted, the icon activating unit 62 sequentially displays icons corresponding to the respective work processes of the mobile terminal through the display 80. A second command of user is inputted through the user interface 50 to the selecting unit 64 so as to select the second work process concurrently performed together with the first work process among the sequentially displayed icons. The selecting unit 64 provides the work process corresponding to the selected icon to the multiprocessing unit 70 in response to the second user command.

'631 Patent at 5:1-16.

> The above-mentioned method for selecting the second work process according to the present invention can simply select the second work process by selecting the icons sequentially displayed while the first work process is performed.

'631 Patent at 7:8-12.

46. Further, in my opinion, a person of ordinary skill in the art would understand the term "sequentially," as used in claims 1 and 8, in accordance with its plain and ordinary meaning. For example, "sequentially" simply connotes a given order specified order without requiring, as suggested by LGE, that a sequence is limited to one at a time. My opinion is supported by at least these definitions:

Term and Dictionary	Definition
Dictionary of Computing, Fifth Ed. (2004) "sequential" / "sequentially"	"arranged in an ordered manner" "[] one after another, in sequence"
Collins Dictionary Electronics (2007) "sequential"	"of or relating to anything following a sequence or series; one by one"
Wiley Electrical and Electronics Engineering Dictionary (2004) "sequence" / "sequential"	"1. An arrangement of two or more things, entities, or events, in a given order. 2. An arrangement of two or more things, entities, or events, in a successive order." "Consisting of, having, following, or characterized by a sequence"
Dictionary of Multimedia Terms & Acronyms, Fourth Edition (2005) "sequence"	"A progression of data, events, images, or sounds in a specified order."

47. Each of these dictionaries confirms that a person of ordinary skill in the art would understand "sequentially" or "sequential" as used in these claim limitations according to their plain understanding. Indeed, this is confirmed, rather than contradicted, by the dictionary definitions provided by LGE. One of ordinary skill in the art would understand immediately the term "sequentially" as a core behavior of modern GUI design and function. The cognitive processes of the user of such devices progresses always in a sequential manner defined by the basic neurological structure of human decision-making. As such modern mobile GUI designs match the progressive sequential nature of human information processing by designing a GUI solution that behaves in a similar sequentially productive manner. The term and related underlying functional definition is a fundamental aspect of modern mobile GUI design.

B. <u>"displaying one icon in a designated portion of a display"</u>

48. I understand that the parties have proposed the following constructions for this term:

Term and Applicable Claims	Pantech Proposed Construction	LGE Proposed Construction
"displaying one icon in a designated portion of a display" (claim 1)	Plain and ordinary meaning	"displaying a single icon in a designated portion of a display"

49. I have reviewed each of the proposed constructions and considered them in view of the claims, specification (including the figures), and prosecution history of the '631 Patent, as well as extrinsic evidence. I am aware of no express lexicography by the patentee setting forth that "one" in this context must mean "a single" (or "just one"), and likewise I have seen no disclaimer to this effect.

50. It is my opinion that a person of ordinary skill in the art will understand the plain and ordinary meaning of "displaying one icon in a designated portion of a display" and thus no construction is necessary. The term "displaying one icon in a designated portion of a display" will be understood by a POSITA because such a description is a fundamental aspect of modern mobile GUI design where standardization of icon location is a primary means of reducing the user's cognitive workload when scanning a mobile device interface screen.

51. For example, I am aware of a textbook titled "Human Interface Guidelines"[1] and it is a core teaching text for a POSITA involved in the design of modern mobile GUI systems.

52. The establishment of a common icon display location is a well understood methodology for also improving other user screen-searching behaviors including reduction in the following

[1] *Apple human interface guidelines: The Apple Desktop Interface.* (1987). Addison-Wesley.

visual processing variables including: Time To First Fixation, Length of Fixation, Number of Repeat Fixations and Response Time to Next Correct Selection. The "displaying one icon in a designated portion of a display" is also a means for improving error detection and error correction when undertaking common interactions with mobile products involving the visual display of system status. The term "displaying one icon in a designated portion of a display" is well understood by a POSITA as a primary means of reducing training time, selection errors and overall cognitive workload.

53. Furthermore, the specification citations below demonstrate that the words should be given their plain meaning and disclose that the '631 Patent does not assign a specific meaning to this claim term and uses these words with their well-known meanings.

> Icons corresponding to the work processes are displayed in response to the first user command. The icons are previously designated with respect to all work processes of the mobile terminal. Every when the first command of user is inputted, the icons are displayed in turn.

'631 Patent at 4:6-11.

> In step S38, an icon corresponding to the first work process is preferably displayed together with an activated screen image of the second work process. The user can know from the displayed icon that the first work process is concurrently performed in the second work process.

'631 Patent at 4:22-27.

> Referring to FIG. 5D, when a first command of user for selecting a new work process of a camera mode is inputted, an icon corresponding to a camera mode work process is displayed in a first portion of a display 43 in response to the first user command. By selecting the displayed camera mode icon, the work process for sending an SMS message is changed to the camera mode work process.

'631 Patent at 4:46-52.

FIG. 5D

’631 Patent at Fig. 5D.

> FIG. 8A illustrates a pop-up menu displayed when the MP3 play process and the SMS message creation process are concurrently performed. Preferably, an icon 44 indicating the MP3 play process concurrently performed together with the SMS message creation process is also displayed in a portion of a display.

’631 Patent at 6:15-20.

54. The extrinsic evidence provided by LGE does not dissuade my opinion. As a first point, “one” needs no definition as it would be readily understood by a person of ordinary skill in the art. And second, a person of ordinary skill in the art would understand that the use of “one” in this claim element serves to delineate the “one icon” from any other icons. Additionally, a POSTIA would not understand the use of “one” to preclude the presence of additional icons. In the context of modern mobile GUI design a POSTIA would fully understand “one icon” to mean the display of a first icon as part of a possible series of selections because basic interactions with all modern

mobile GUI design user interfaces start with a single cognitive unit and proceed in a stepwise fashion from one task to the next through the selection of "one icon" signifying access to a feature or function of the device. A POSITA always designs from the single, one selection, task flow perspective even though observed interactions may give the impression of multi-tasking behavior on the part of the user. The human eye and mind do not process information in parallel but in a rapid sequential manner.

55. For example, I am aware of a textbook titled "The Multi-Tasking Myth"[2] by Loukopoulos, Dismukes and Barshi and it is a core teaching text for a POSITA involved in the design of modern mobile GUI systems.

56. It is the one icon equals one task or subtask that defines the modern mobile GUI. It is important to note that even though the user of a modern mobile GUI is processing interactions sequentially, it is clear that the underlying processors and related hardware and software of the actual device can be technically performing operations in parallel waiting for calls by the user from the GUI for delivery of underlying features, function, or content.

57. Therefore, a person of ordinary skill in the art would understand that the term "displaying one icon in a designated portion of the display" in claim 1 according to its plain and ordinary meaning.

C. "control menu"

58. I understand that the parties have proposed the following constructions for this term:

[2] Loukopoulos, L. D., Dismukes, K., & Barshi, I. (2009). *The multitasking myth: Handling complexity in real-world operations*. Ashgate Publishing, Ltd.

Term and Applicable Claims	Pantech Proposed Construction	LGE Proposed Construction
"control menu" (claims 1, 3)	Plain and ordinary meaning (*e.g.*, a pop-up menu, a menu window, or the like)	Plain and ordinary meaning

59. I have reviewed each of the proposed constructions and considered them in view of the claims, specification (including the figures), and prosecution history of the '631 Patent, as well as extrinsic evidence.

60. It is my opinion that a person of ordinary skill in the art will understand the plain and ordinary meaning of "control menu" and that no construction is necessary. So well understood is this claim term that there are entire human factor engineering textbooks written on the subject of "control menu" concepts and principles. For example, I am aware of a textbook titled "The Psychology of Menu Selection[3]" by Kent L. Norman and it is a core teaching text for a POSITA involved in the design of modern mobile GUI systems. A "control menu" is a fundamental building block of modern mobile GUI design and as such is well understood by a qualified POSITA. It is important to understand that control menus can and do take many forms depending on the nature of the tasks being undertaken by the user, the complexity of the task flow and the prior experience related to "control menu" utilization, training, and error management.

61. Furthermore, the specification citations below demonstrate that the words should be given their plain meaning and disclose that the '631 Patent does not assign a specific meaning to this claim term and uses these words with their well-known meanings.

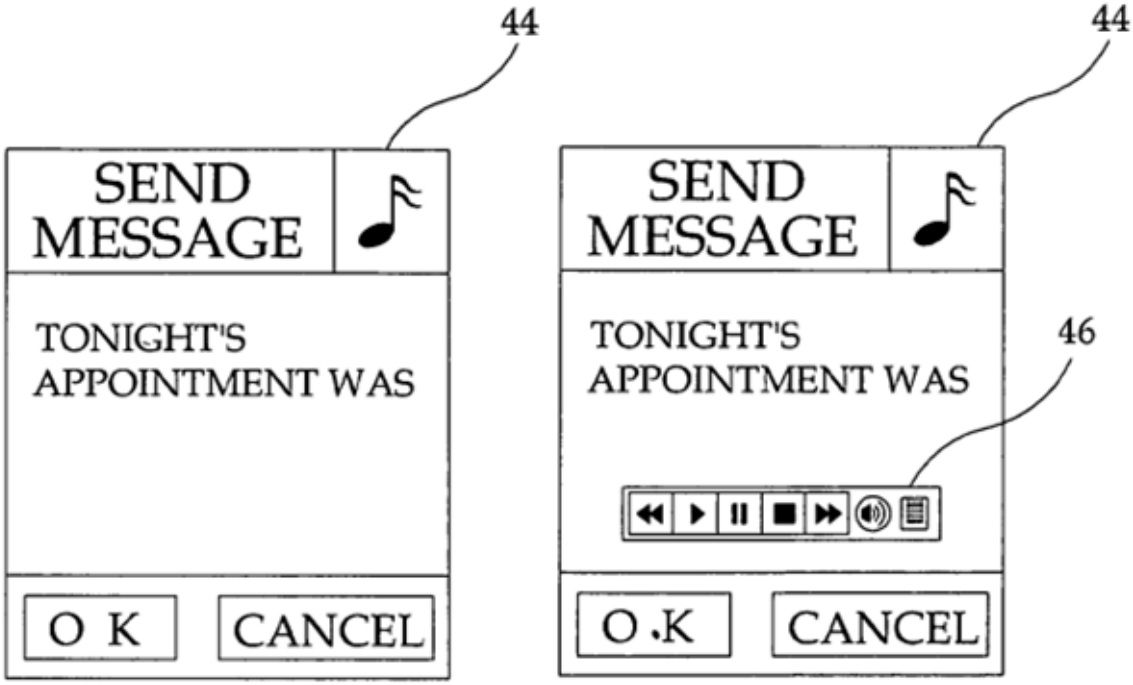
[3] Norman, K. L. (1991). *The psychology of menu selection: Designing cognitive control at the human/computer interface*. Intellect Books.

> Provided is a method for controlling a plurality of work processes in a multitasking mobile terminal, and more particularly, a method for selecting a second work process during a first work process and controlling a predetermined function of the selected second work process. In the controlling method, icons corresponding to the respective work processes are displayed in response to a user command, and a desired work process is selected through the displayed icons. A predetermined function of the selected work process is controlled through a pop-up menu activated in response to the user command.

’631 Patent at Abstract.

> Referring to FIG. 7, in step S40, a first command of user is inputted so as to control the function of the MP3 play process while the SMS message is created. In step S42, a pop-up menu for controlling the function of the MP3 play process is activated in the display of the mobile terminal in response to the first command of user.
>
> In step S44, when the pop-up menu is activated, a second command of user is inputted for controlling the function of the MP3 play process, and the function of the MP3 play process is controlled in response to the second command of user. When the pop-up menu is activated, a pop-up process for controlling the function of the MP3 play process is assigned to a temporary queue by using the activated pop-up menu, and the pop-up process is concurrently performed together with the creation of the SMS message.
>
> That is, the pop-up process and the SMS message creation process are divided in quantum units, and the pop-up process and the SMS message send process are alternately performed at regular time intervals. When the second command of user is inputted, the pop-up process generates the control signal corresponding to the second command of user and provides the generated control signal to the MP3 play process. The MP3 play process controls the function of the MP3 play process in response to the control signal.
>
> In step S46, it is determined whether or not a third command of user for returning to the SMS message creation process is inputted. In step S48, when the third command of user is inputted after the control of the function of the MP3 play process is completed, the activated pop-up menu is deactivated. Even though the pop-up menu is deleted from the temporary queue and the pop-up process is terminated, the MP3 play process and the SMS message creation process continue to be performed and the user can keep on creating the SMS message while listening to the MP3 music.

’631 Patent at 5:40-6:6.



’631 Patent at FIG. 8A and FIG. 8B.

> FIG. 8A and FIG. 8B illustrate the displayed pop-up menus according to an embodiment of the present invention.
>
> FIG. 8A illustrates a pop-up menu displayed when the MP3 play process and the SMS message creation process are concurrently performed. Preferably, an icon 44 indicating the MP3 play process concurrently performed together with the SMS message creation process is also displayed in a portion of a display.
>
> FIG. 8B illustrates a pop-up menu displayed in response to the first command of user. The pop-up menu 46 has a predetermined format, and image information for the pop-up menu 46 displayed is stored in the memory of the mobile terminal. Preferably, in response to the first command of user, the pop-up menu 46 may be displayed brightly and clearly, while the screen corresponding to the SMS message process may be displayed darkly and unclearly.

’631 Patent at 6:13-28.

> A first command of user is inputted through the user interface 100. The pop-up menu activating unit 110 acquires image information of a pop-up menu stored in the memory 170 in a predetermined format through the data bus 150, and activates the pop-up menu on the

> display 140. Meanwhile, the temporary queue 130 stores a pop-up process.

'631 Patent at 6:40-45.

62. Further, in my opinion, a person of ordinary skill in the art would understand "control menu" as used in claims 1 and 3 in accordance with its plain and ordinary meaning. For example, a "control menu" may include a pop-up menu, a menu window, or the like. My opinion is supported by at least these definitions:

Term and Dictionary	Definition
Dictionary of Computing, Fifth Ed. (2004) "menu"	"a list of options or programs available to the user"
Wiley Electrical and Electronics Engineering Dictionary (2004) "menu"	"1. A list of commands, options, or functions which are available to a computer user. Such menus are common in GUIs, and come in various forms, including pull-down, and may be accessed using a mouse or other pointing device, or the keyboard. A logically organized menu can help users maximize the usefulness of any given application. 2. A list of commands, options, or functions which are available to a user of a given device, piece of equipment, or system.")
Dictionary of Multimedia Terms & Acronyms, Fourth Edition (2005) "menu"	"A list of options from which users may choose. The options are often available through a drop-down menu bar at the top of a graphical user interface (GUI) screen."

63. Each of these dictionaries confirms that a person of ordinary skill in the art would understand "menu" as used in "control menu" according to their plain understanding *e.g.*, a pop-up menu, a menu window, or the like and LGE offers no persuasive evidence to the contrary.

64. There is a large field of professional research literature covering GUI menu elements including the text noted above. *See supra* at fn. 4.

65. The term "menu" has been a core aspect of POSITA training and application theory and practice going back to the original GUI invention by Douglas Engelbart[4] in the 1960's and 1970's. In modern GUI development there are numerous textbooks[5] utilized in the training of a POSITA that cover "menu" design, utilization, and optimization.

66. For example, I am aware of a textbook titled "The Windows Interface: An Application Design Guide"[6] and it is a core teaching text for a POSITA involved in the design of modern mobile GUI systems.

67. The term menu is a ubiquitous aspect of GUI design and is at the core of understanding for a person of ordinary skill in the art.

D. "predetermined function"

68. I understand that the parties have proposed the following constructions for this term:

Term and Applicable Claims	Pantech Proposed Construction	LGE Proposed Construction
"predetermined function" (claims 1, 2)	Plain and ordinary meaning (*i.e.*, a function among those selected in advance)	Plain and ordinary meaning

69. I have reviewed each of the proposed constructions and considered them in view of the claims, specification (including the figures), and prosecution history of the '631 Patent, as well as extrinsic evidence.

[4] https://spectrum.ieee.org/graphical-user-interface#toggle-gdpr

[5] Fowler, S. L. (1995). The GUI style guide. *AP Professional*.

[6] Microsoft Corp (1992). *The windows interface: An application design guide*. Microsoft Press.

70. It is my opinion that a person of ordinary skill in the art will understand the plain and ordinary meaning of this claim term and that no construction is necessary. In the context of modern mobile device GUI design "predetermined function" is a well understood term of art.

71. When designing a modern mobile GUI a POSITA will routinely undertake a formal mapping of device task flows and functions known technically as a "cognitive task analysis" or CTA.[7]

72. For example, I am aware of a textbook titled "Cognitive Task Analysis, by Schraagen, Chipamn and Shalin" and it is a core teaching text for a POSITA involved in the design of modern mobile GUI systems.

73. The CTA process is fundamentally focused on providing the POSITA with a highly detailed understanding of how underlying engineering information being processed in the mobile device will be passed to and displayed to the user through the GUI based on each specific task flow. Such an analysis is one reason that a GUI design POSITA will often understand the operation of a mobile device in rigorous detail often in greater detail than that of the hardware engineering teams working below the GUI design. Sometimes the GUI POSITA is the only individual(s) that understands all the features and functions of a mobile device as experienced by the user of such devices. In the execution of a cognitive task analysis a POSITA will decompose the flow of information between the device and the user by examining each function in a structured manner. In this process a common mapping of user task flows is a behavior known as a "predetermined function." This type of GUI behavior involves analysis by the POSITA to determine how the "predetermined function" impacts user skill acquisition, cognitive workload, error detection, error

[7]Schraagen, J. M., Chipman, S. F., & Shalin, V. L. (Eds.). (2000). *Cognitive task analysis*. Psychology Press.

correction and automation[8]. Features with a "predetermined function" are a class of tasks examined by POSITA in the development and testing of modern mobile GUI solutions and are well understood.

74. Furthermore, the specification citations below demonstrate that the words should be given their plain meaning and disclose that the '631 Patent does not assign a specific meaning to this claim term and uses these words with their well-known meanings.

> The present invention relates to a method for controlling a plurality of work processes in a multitasking mobile terminal, and more particularly, to a method for selecting a second work process during a first work process and controlling a predetermined function of the selected second work process.

'631 Patent at 1:23-28.

> According to another aspect of the present invention, there is provided a method for controlling a predetermined function of a second work process during a first work process in a multitasking mobile terminal that concurrently performs the first work process and the second work process. The controlling method includes: inputting a first command of user for selecting a predetermined function of the second work process; activating a pop-up menu for controlling the predetermined function of the second work process in response to the first command of user; and controlling the predetermined function of the second work process through the activated pop-up menu.

'631 Patent at 3:1-12.

75. Accordingly, a person of ordinary skill in the art would understand that the term "predetermined function" in claims 1 and 2 according to its plain and ordinary meaning *i.e.*, a function among those selected in advance.

[8] Goodstein, L. P., Andersen, H. B., & Olsen, S. E. (1988). *Tasks, errors and mental models.* Taylor and Francis.

IX. ABOUT THE REFERENCES IN THIS REPORT

76. As an expert in GUI design for more than 40 years I have experience with a vast array of publications and teaching materials utilized by a POSITA in the modern mobile GUI design. Such expertise requires a reading of original texts combined with study of recent mobile device GUI design guidelines. The core GUI design principles developed for desktop applications have now migrated to modern mobile GUI design. The same core human factors engineering theory and practice apply equally to desktop and mobile applications. However, in the context of this claim construction report I would also note that in addition to the historically relevant and important texts noted above a POSITA would also engage with GUI design guidelines for mobile devices focused generally on iOS and Android. Both Apple (iOS) and Google (Android) offer the mobile device GUI POSITA extensive online access to resources for aiding in the design of modern mobile GUI systems. Such resources include in part the following:

77. Designing for iOS: https://developer.apple.com/design/human-interface-guidelines/designing-for-ios

78. Develop UI for Android: https://developer.android.com/develop/ui

79. My extensive experience with these brand-specific GUI mobile device guidelines validate my opinions expressed above without qualification. Furthermore, the earlier references noted in the body of the report underscore the understanding of a POSITA, and thus further demonstrate the concepts applied by a POSITA to the claim terms being construed in this matter.

X. RESERVATION OF RIGHTS

In addition to the opinions and evidence expressed herein, I reserve the right to rebut any arguments made or evidence presented in response to this report. I also reserve the right to supplement this report based on further investigation or analysis.