

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTOROLA MOBILITY LLC and
GOOGLE LLC
Petitioners,

v.

MULTIFOLD INTERNATIONAL INCORPORATED PTE. LTD.,
Patent Owner.

Case No. IPR2025-00039

U.S. Patent No. 9,146,589

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,146,589**

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Mandatory Notices.....	3
A. Real Party-in-Interest	3
B. Related Matters.....	3
C. Notice of Counsel and Service Information.....	4
III. Requirements for IPR	5
A. Standing.....	5
B. Challenge and Relief Requested	6
IV. Discretionary Denial is Unwarranted	7
A. 35 U.S.C. § 314(a).....	7
B. 35 U.S.C. § 325(d).....	9
V. Overview Of The '589 Patent.....	10
A. Relevant Prosecution History.....	10
VI. Prior Art Overview	12
A. Aono	12
VII. Claim Construction.....	16
A. Level of Ordinary Skill in the Art.....	16
B. “screen”	16
C. “display”	16
VIII. How the Challenged Claims Are Unpatentable.....	17
A. Ground 1: The Challenged Claims are Obvious in View of Aono	17
1. Claim 1	18
2. Claim 2	55
3. Claim 3	59
4. Claim 4	61

TABLE OF CONTENTS

	Page
5. Claim 5.....	63
6. Claim 6.....	66
7. Claim 11	67
8. Claim 12.....	82
9. Claim 13.....	84
10. Claim 14.....	85
11. Claim 16.....	87
B. Secondary Considerations of Non-Obviousness.....	91
IX. Conclusion	92

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH</i> , IPR2019-01469, Paper 6 (Feb. 13, 2020)	9
<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)	7, 8, 9
<i>Boston Scientific Scimed, Inc. v. Cordis Corp.</i> , 554 F.3d 982 (Fed. Cir. 2009)	39
<i>Monsanto Tech. LLC v. E.I. Dupont De Nemours & Co.</i> , 878 F.3d 1336 (Fed. Cir. 2018)	18
<i>Multifold International Incorporated Pte. Ltd. v. Google LLC</i> , C.A. No. 23-1323-JLH	3, 4, 7
<i>Multifold International Incorporated Pte. Ltd. v. Motorola Mobility LLC</i> , C.A. No. 23-1173-JLH	3, 4, 7
<i>Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC</i> , IPR2019-01393, Paper 24, 7 (PTAB June 16, 2020)	7, 8
<i>Thorner v. Sony Computer Entertainment America LLC</i> , 669 F.3d 1362 (Fed. Cir. 2012)	16, 17
<i>Unification Techs. LLC v. Micron Tech. Inc.</i> , No. 2023-1348, 2024 WL 3738401 (Fed. Cir. Aug. 9, 2024)	17
Statutes	
35 U.S.C. § 102	6
35 U.S.C. § 103	7
35 U.S.C. § 314	7

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

35 U.S.C. § 315 4

35 U.S.C. § 325 9

Other Authorities

37 C.F.R. § 42.8(b)(1) 3

LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Pat. No. 9,146,589 to Sirpal
1002	File History for U.S. Pat. No. 9,146,589 to Sirpal
1003	Declaration of Dr. Jeffrey J. Rodriguez
1004	U.S. Pub. 2012/0139815 A1 to Aono
1005	U.S. Patent No. 8,928,552 to Aono
1006	Curriculum Vitae of Dr. Jeffrey J. Rodriguez
1007	Scheduling Order in the District Court Actions, dated April 29, 2024
1008	E-mail from counsel for Patent Owner, dated September 27, 2024, identifying the asserted claims in the District Court Actions
1009	U.S. Patent No. 7,471,890 to Lee
1010	U.S. Patent Application Publication No. 2011/0193806 A1 to Kim
1011	U.S. Patent App. Pub. No. 2002/0142810 to Kawasaki
1012	U.S. Patent Publication No. 2010/0048190 to Park
1013	U.S. Patent Application Publication No. 2010/0248788 to Yook
1014	U.S. Pub. 2009/0190295 A1 to Chin
1015	U.S. Pub. 2005/0078211 A1 to Whitehorn

LIST OF CHALLENGED CLAIMS

Limitation	Claim Language
[1P]	A method, comprising:
[1A]	providing a device having at least first and second screens;
[1B]	receiving user interface input to execute an image capture function;
[1C]	presenting a first display for the image capture function based on a physical device state, a display mode and a device orientation,
[1D]	the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max;
[1E]	receiving a device orientation change, wherein the device orientation change is a rotation of the device; and
[1F]	based on the device orientation change, the device state and the display mode, presenting a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.
[2]	The method of claim 1, wherein the image capture function is configured to capture an inward-facing image.
[3]	The method of claim 2, wherein the device is in an open state.
[4]	The method of claim 3, wherein the first display is a portrait display.
[5]	The method of claim 4, wherein the second display is a landscape display.
[6]	The method of claim 5, wherein the portion that changes includes an image preview changing from a portrait orientation to a landscape orientation.
[11P]	A device, comprising:
[11A]	a first screen, the first screen including a first gesture capture region;
[11B]	a second screen, wherein the second screen faces in a substantially same direction as the first screen when the device is open, and wherein a lens is associated with the second screen;
[11C]	a memory;

[11D]	a processor in communication with the memory, the first screen, and the second screen, the processor operable to:
[11E]	receive user interface input to execute a image capture function;
[11F]	determine an image capture function configuration, a device orientation, and a physical device state,
[11G]	wherein the image capture function configuration is for a self-portrait, the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max;
[11H]	based on the image capture function configuration, the device orientation, and the device state, enter a dual screen mode for the image capture function;
[11I]	present a first display for the image capture function;
[11J]	receive a device orientation change, wherein the device orientation change is a rotation of the device; and
[11K]	based on the device orientation change, the image capture function configuration and the device state, present a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.
[12A]	The device of claim 11, wherein the device is in an open state,.
[12B]	wherein the first display is in a landscape orientation, and
[12C]	wherein the image capture mode is a self-portrait mode.
[13]	The device of claim 11, wherein the second display is in a portrait orientation.
[14]	The device of claim 13, wherein the portion that changes includes an image preview changing from a landscape orientation to a portrait orientation.
[16P]	A non-transitory computer readable medium having stored thereon computer-executable instructions, the computer executable instructions causing a processor of a device to execute a method for providing a user interface, the computer-executable instructions comprising:
[16A]	instructions to receive user interface input to execute a image capture function;

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

[16B]	instructions to determine an image capture function configuration, a device orientation, and a physical device state,
[16C]	wherein the device has at least first and second screens,
[16D]	wherein the device is in an open state,
[16E]	wherein, in the open state, the first and second screens face in substantially same directions,
[16F]	wherein the image capture function is configured to capture an inward-facing image,
[16G]	and wherein a lens is associated with the second screen;
[16H]	based on the image capture function configuration, the device orientation, and the physical device state, instructions to enter a dual screen mode for the image capture function,
[16I]	the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max;
[16J]	instructions to present a first display for the image capture function;
[16K]	instructions to receive a device orientation change, wherein the device orientation change is a rotation of the device; and
[16L]	based on the device orientation change, the image capture function configuration and the device state, instructions to present a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.

I. Introduction

Petitioners Motorola Mobility LLC (“Motorola”) and Google LLC (“Google”) (collectively, “Petitioners”) respectfully request *inter partes* review of claims 1-6, 11-14, and 16 (the “Challenged Claims”) of U.S. Patent No. 9,146,589 (Ex. 1001, “’589 patent”), which is assigned to Multifold International Incorporated Pte. Ltd. (“Multifold” or “Patent Owner”).

By September 2011, the earliest claimed priority date of the ’589 patent, handheld devices like cell phones and personal digital assistants had long been known in the art and indeed were ubiquitous. These devices had various common functions, including being able to take pictures or videos. Many of these devices could have different physical configurations (e.g., open or folded closed), could be used in different orientations (e.g., portrait or landscape), and had different image capture function configurations (e.g., taking an outward-facing image or inward-facing image, or self-portrait). And many of these devices had more than one screen.

The ’589 patent relates to just such a device, with multiple screens that could capture images in different configurations and be physically configured in different states and orientations. This functionality also was known in the prior art, including in the principal reference discussed in this Petition, Aono.

Aono teaches a “personal digital assistant having multiple screens” such as a “three-screen folding-type configuration” with various sensors to detect states,

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

configurations, and orientations of the device. Aono teaches capturing images using this device and presenting different displays for the image capture function based on the device state, orientation, and modes, thereby disclosing the functionality that the applicant argued was missing from the prior art of record during prosecution. At the least, any minor differences between the subject matter of the Challenged Claims and the disclosures of Aono would have been obvious to one of ordinary skill in the art. The Challenged Claims are, therefore, unpatentable.

II. Mandatory Notices

A. Real Party-in-Interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioners identify Motorola Mobility LLC¹ and Google LLC² as the real parties-in-interest.

B. Related Matters

The '589 patent is currently the subject of patent infringement lawsuits brought by Patent Owner, which include *Multifold International Incorporated Pte. Ltd. v. Motorola Mobility LLC*, C.A. No. 23-1173-JLH pending in the United States District Court for the District of Delaware (“*Motorola Action*”) and *Multifold International Incorporated Pte. Ltd. v. Google LLC*, C.A. No. 23-1323-JLH pending in the United States District Court for the District of Delaware (“*Google Action*”) (collectively, the “District Court Actions”). On October 18, 2023, Multifold served

¹ Motorola Mobility LLC is a direct, wholly owned subsidiary of Motorola Mobility Holdings LLC, which is indirectly a wholly-owned subsidiary of Lenovo Group Ltd. Motorola Mobility Holdings LLC and Lenovo Group Ltd. are not real parties-in-interest to this proceeding.

² Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

Motorola the complaint in the *Motorola* Action. On November 20, 2023, Multifold served Google the complaint in the *Google* Action. Thus, this petition is timely under 35 U.S.C. § 315(b).

C. Notice of Counsel and Service Information

Petitioners designate the following counsel.

Counsel For Petitioner Motorola: (1) T. Vann Pearce, Jr. (lead counsel) (Registration No. 58,945), (2) Christopher J. Higgins (backup counsel) (Registration No. 66,422), (3) Geoffrey Moss (backup counsel) (*pro hac vice* to be filed), (4) Elaine Ke (backup counsel) (*pro hac vice* to be filed).

Service Information for Petitioner Motorola: Orrick, Herrington & Sutcliffe LLP, 2100 Pennsylvania Avenue NW, Washington, DC 20037, Telephone: (202) 339-8600, Facsimile: (202) 339-8500, Email: TVPPTABDocket@orrick.com, 0CHPTABDocket@orrick.com.

Counsel For Petitioner Google: (1) Naveen Modi (backup counsel) (Registration No. 46,224, naveenmodi@paulhastings.com), (2) Joseph E. Palys (backup counsel) (Registration No. 46,508, josephpalys@paulhastings.com), (3) Daniel Zeilberger (backup counsel) (Registration No. 65,349, danielzeilberger@paulhastings.com), (4) Howard Herr (backup counsel) (*pro hac vice* to be filed), (5) Quadeer Ahmed (backup counsel) (Registration No. 60,835,

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

quadeerahmed@paulhastings.com), and (6) David Valente (Reg. No. 76,287,
davidvalente@paulhastings.com).

Service Information for Petitioner Google: Paul Hastings LLP, 2050 M Street
NW, Washington, D.C. 20036, Tel.: 202.551.1700, Fax: 202.551.1705, email: PH-Google-Multifold-IPR@paulhastings.com.

Petitioners consent to service by electronic mail at the addresses listed above.
Petitioners' Powers of Attorney are filed herewith.

The USPTO is authorized to charge the filing fee and any other fees incurred
by Petitioners to the deposit account of Orrick, Herrington, & Sutcliffe LLP: 15-
0665.

III. Requirements for IPR

A. Standing

Petitioners certify that the '589 patent is available for IPR, and that Petitioners
are not barred or estopped from requesting this review.

B. Challenge and Relief Requested

Petitioner relies on the following reference: U.S. Pub. 2012/0139815 A1 to Aono (Ex. 1004, “Aono”)³. Aono is a publication of U.S. patent application no. 13/180,795, which was filed on July 12, 2011, before the ’589 patent’s earliest priority claim (September 27, 2011)⁴. Thus, Aono is prior art at least under pre-AIA 35 U.S.C. §102(a) and (e).

Petitioner requests that the Challenged Claims be determined unpatentable and cancelled on the following grounds:

³ Aono published on June 7, 2012. Aono ultimately issued as U.S. Patent No. 8,928,552 (Ex. 1005). The Aono ’552 patent, which has the same disclosures as Aono, thus also would be prior art to the ’589 patent at least under pre-AIA 35 U.S.C. § 102(a) and (e), and would have rendered the Challenged Claims obvious to a POSITA for the same reasons as discussed herein with respect to the Aono ’815 publication.

⁴ Petitioners do not concede that the ’589 patent is entitled to such a priority date and reserve the right to challenge such priority claim in this proceeding and other proceedings.

Ground 1: The Challenged Claims are unpatentable under pre-AIA 35 U.S.C. § 103 as being obvious in view of Aono.

This Petition is supported by the Declaration of Dr. Jeffrey J. Rodriguez (Ex. 1003).

IV. Discretionary Denial is Unwarranted

A. 35 U.S.C. § 314(a)

The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”) factors strongly favor institution and weigh against discretionary denial here.

1. *Possibility of a Stay*

Motorola and Google may request a stay of the *Motorola* Action and *Google* Action, respectively, if institution is granted. Thus, this factor is neutral. *See, e.g., Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24, 7 (PTAB June 16, 2020) (“*Sand Revolution*”) (the Board will not attempt to predict how the district court litigation will proceed).

2. *The Courts’ Trial Dates*

This factor favors institution. Trial in the *Motorola* Action is scheduled for August 3, 2026. Ex. 1007, ¶23. Trial in the *Google* Action is scheduled for November 16, 2026. *Id.* This IPR should conclude months before either trial. Accordingly, this factor weighs heavily against a discretionary denial.

3. *Investment in the Parallel Proceedings*

This factor favors institution. To date, the parties and Court have invested relatively little in the District Court Actions, particularly as to invalidity. Discovery recently commenced and the parties have served their respective initial contentions. Ex. 1007, ¶7. The claim construction process has not begun, and the claim construction hearing is not until June 27, 2025, after the expected date of the institution decision. Ex. 1007, ¶14. No depositions have occurred, no expert discovery has been conducted, and no summary judgment motions have been filed. *See Sand Revolution*, 11.

Moreover, Petitioners proceeded with reasonable diligence. Patent Owner has asserted sixteen patents and initially asserted over 100 claims in the litigation. Petitioners filed this Petition within three months of receiving Patent Owner's initial infringement contentions and just two weeks after Patent Owner was required to narrow the number of Asserted Claims from 100 to 40. Ex. 1007, ¶8. "[I]t is often reasonable for a petitioner to wait to file its petition until it learns which claims are being asserted against it in the parallel proceeding." *Fintiv* at 11.

4. *Overlap of Issues with the Parallel Proceeding*

This factor favors institution and should be given significant weight because Petitioners challenge claims not currently at issue in the District Court Actions. Specifically, Patent Owner does not assert Claims 1-6 and 16. Ex. 1008.

5. *Overlap of Parties*

Petitioners and Patent Owner are the parties in the District Court Actions. This, however, is of little moment as the parties overlap in most situations where the patent-at-issue is both the subject of an IPR petition and asserted in district court.

6. *Other Circumstances That Impact the Board’s Exercise of Discretion, Including the Merits*

The strength of this Petition strongly favors institution. *See Fintiv* at 14-15 (instituting particularly meritorious petitions is favored because it “may serve the interest of overall system efficiency and integrity”). This petition is premised on prior art not previously considered by the Patent Office that plainly teaches and renders obvious what the Challenged Claims require.

B. 35 U.S.C. § 325(d)

This Petition relies on prior art references that were not of record during the prosecution of the ’589 patent. *See generally* Ex. 1001, 1002. The arguments presented here also differ substantially from those presented during prosecution. As discussed below, the applicant obtained allowance over the prior art of record by amending the claim language to recite “the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max.” Ex. 1002, p. 54-57. Aono discloses this limitation. Thus, denial under Section 325(d) would be inappropriate. *See Advanced Bionics, LLC v. Med-El*

Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (Feb. 13, 2020)
(precedential).

V. Overview Of The '589 Patent

The '589 patent recognizes that “[t]he small form factor of handheld computing devices requires a careful balancing between the displayed graphics and the area provided for receiving inputs.” Ex. 1001, 1:26-28. Many such devices use “a touch screen display not only to deliver display information to the user but also to receive inputs from user interface commands.” *Id.*, 1:15-19. The '589 patent considers conventional single-display touch screen devices to be “crippled” by space constraints. *Id.*, 1:37-41.

The '589 patent is instead directed to a “dual multi-display handheld computing device.” *Id.*, 1:45-48. Relevant here, the '589 patent describes devices, with at least two screens, capable of image capture functions. *Id.*, 1:63-67. The screens may face opposite directions when the device is closed. *Id.*, 1:56-57. These devices are further capable of different image capture modes or configurations depending on image function configuration, device orientation, or device state. *Id.*, 1:67-2:3. Aono teaches each of these features.

A. Relevant Prosecution History

The application claims went through several rounds of rejections and amendments. U.S. Patent Publication No. 2010/2010/0060664 (“Kilpatrick II”) was

the primary prior art cited in the rejections. Ex. 1002, p. 64-77, 184-194. The examiner repeatedly found that Kilpatrick II taught, *inter alia*, a device with two screens and an image capture function, which receives a device orientation change (*e.g.*, a device rotation from landscape to portrait), and based on that rotation change, a portion on the display of both screens changed. *Id.*

Ultimately, the applicant overcame these rejections by amending the independent claims to recite that the claimed device state was “physical” and to specify: “the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max.” *Id.*, p. 53-60. In the accompanying remarks, the applicant referenced a telephone interview with the examiner in which it was “discussed that the changing of the displays in the claims was based on 3 items: i) a device state, 2) a display mode and 3) a device orientation.” *Id.*, p. 58. “It was also discussed that Kilpatrick in Figs 39-40 changed what was displayed based on orientation.” *Id.* The applicant argued that Kilpatrick did not teach or suggest: “presenting a first display for the image capture *function based on a physical device state, a display mode and a device orientation*, the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max, and *based on the device orientation*

change, the device state and the display mode, presenting a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.” (emphasis in the original). *Id.* The examiner subsequently allowed the claims. Ex. 1002, p. 27-31.

VI. Prior Art Overview

A. Aono

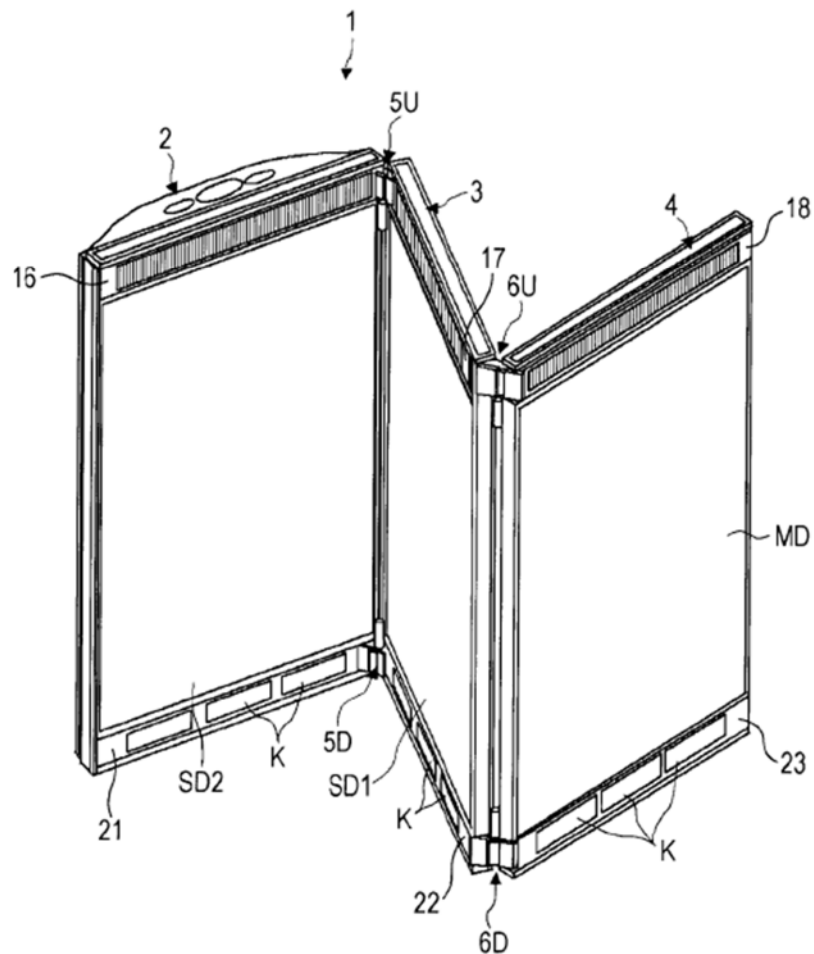
Aono describes as background that “personal digital assistants having a large screen display or two-screen display panel have been commercially produced. With these personal digital assistants, using a large screen display or two-screen display panel enables a great number of information to be displayed at the same time, or enables information to be enlarged and displayed.” Ex. 1004, [0005]. Aono notes a device with a large screen display “includes a drawback, in that it is difficult to reduce the size of a device having such a large screen display panel, and accordingly portability is poor.” *Id.*, [0008].

Aono recognizes that two-screen personal digital assistants can be “folding” and thereby achieve “high portability.” *Id.*, [0009]. But Aono also notes a device with a two-screen display can have drawbacks including when “the aspect ratio of one screen of display panel differs from an aspect ratio at the time of adding two screens of display panels.” *Id.*, [0009]. Thus, “in the event of displaying a content having a fineness ratio optimized to the aspect ratio of a display panel of one screen

using a display panel of two screens, this aspect ratio of two screens does not match the fineness ratio of the content.” *Id.* In addition, “in the event of displaying a content having a fineness ratio optimized to the aspect ratio obtained by adding the two screens on the display panel of one screen, the aspect ratio of this one screen does not match the fineness ratio of the content.” *Id.* Aono therefor recognizes that it would be desirable to provide a PDA “which enables display or enlarged display of a great number of information using multiple screens, enables optimal display as to various contents while satisfying a user’s various applications and requests, [and] realizes screen opening/closing by simple operations” in a small, thin, and simple configuration. *Id.*, [0013].

Aono discloses such a “personal digital assistant having multiple screens, and a display control method and display control program of the personal digital assistant.” *Id.*, [0003]. In one embodiment, the personal digital assistant **1** “is configured so as to have three casings of a first casing **2**, a second casing **3**, and a third casing **4**” and each such casing “has a display panel of a predetermined aspect ratio on the first principal surface side, and has a texture panel on the second principal surface side.” *Id.* [0082]. The personal digital assistant **1** has a “three-screen folding-type configuration whereby the first casing **2** through third casing **4** can be opened/closed by folding.” *Id.*, [0253]. The folding of the casings is illustrated in Figure 1:

FIG. 1



Id., Fig. 1. The Aono device is also configured with a digital camera capable of capturing images during a “camera shooting mode.”. *Id.*, [0083], [0231]-[0233].

Aono discloses a variety of sensors to detect the state of the personal digital assistant **1**, including “a horizontal/vertical detection sensor, a direction detection sensor, a position detection sensor, an acceleration detection sensor, a temperature detection sensor, a humidity detection sensor, an optical detection sensor, an infrared sensor, and further other various sensors.” *Id.* [0270]. Based on determinations made

by the sensors as to the state of the device, Aono discloses displaying images on a single display or enlarged across up to three displays. *Id.*, [0152]-[0154]. Aono illustrates this in Figures 26 and 27:

FIG. 26

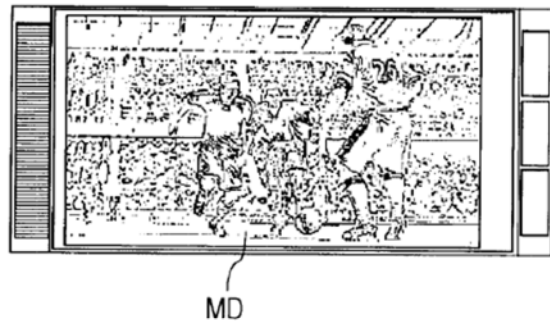
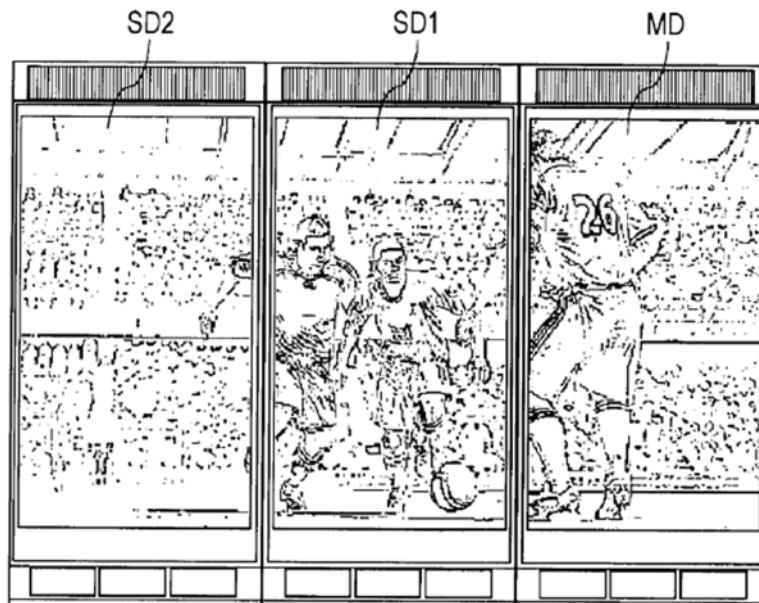


FIG. 27



Id., Figs. 26-27, [0152]-[0154].

VII. Claim Construction

A. Level of Ordinary Skill in the Art

A person of ordinary skill in the art at the time of the alleged invention of the '589 patent ("POSITA") would have had at least a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field plus at least two years of work or post-graduate experience in image capture, image processing, image display, user interfaces, or a related field. Additional education could offset a lesser amount of experience and vice versa. Ex. 1003, ¶¶ 38-42.

B. "screen"

The '589 patent expressly defines the term "screen": "The term 'screen,' 'touch screen,' or 'touchscreen' refers to a physical structure that includes one or more hardware components that provide the device with the ability to render a user interface and/or receive user input." Ex. 1001, 2:64-65. A POSITA would have understood the term "screen" in the claims to have this meaning expressly set forth in the specification. Ex. 1003, ¶¶ 43-44; *see also Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (a patentee acts as a lexicographer by "clearly set[ting] forth a definition of the disputed claim term."

C. "display"

The '589 patent also expressly defines "display" when used as a noun: "The term 'display' refers to a portion of one or more screens used to display the output

of a computer to a user.” Ex. 1001, 3:29-30. A POSITA likewise would have understood the term “display” in the claims to have this meaning expressly set forth in the specification. Ex. 1003, ¶¶ 43-44; *see also Thorner*, 669 F.3d at 1365.

VIII. How the Challenged Claims Are Unpatentable

A. Ground 1: The Challenged Claims are Obvious in View of Aono

Aono, considered in view of the knowledge of a POSITA, would have rendered the challenged claims obvious to a POSITA.

Aono is analogous art to the ’589 patent. The ’589 patent concerns multi-display handheld computing devices. Ex. 1001, 1:45-48. So does Aono. *See, e.g.*, Ex. 1004, [0003]. Aono’s disclosures also are reasonably pertinent to the problem purportedly addressed by the ’589 patent; both Aono and the ’589 patent address how to present information in different image capture modes in a rotatable or foldable handheld electronic device. *See, e.g.*, Ex. 1001, Abstract; Ex. 1004, Abstract, [0013]-[0014]; Ex. 1003, ¶ 62.

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, all the limitations of the Challenged Claims, as set forth below, and thus at minimum would have rendered obvious the Challenged Claims. Any differences between the express or inherent disclosures of Aono and the subject matter of the Challenged Claims would have been, at most, routine, simple, and obvious to a POSITA. *See Unification Techs. LLC v. Micron Tech. Inc.*, No. 2023-1348, 2024

WL 3738401, at *6 (Fed. Cir. Aug. 9, 2024) (affirming obviousness over a single reference that taught every limitation in view of expert’s testimony about what a POSITA would have understood from the reference’s disclosures); *Monsanto Tech. LLC v. E.I. DuPont De Nemours & Co.*, 878 F.3d 1336, 1347 (Fed. Cir. 2018) (affirming PTAB’s determination “that a PHOSITA would have been motivated to combine elements of [a single prior art reference]” to find claim obvious). Additional specific comments on obviousness are included in the analysis that follows.

1. Claim 1

[1P] A method, comprising:

If the preamble is limiting, Aono discloses this limitation. Aono discloses a method with the steps set forth in the following sections. Aono illustrates an example method of controlling the disclosed device in Figures 60 and 61:

FIG. 60

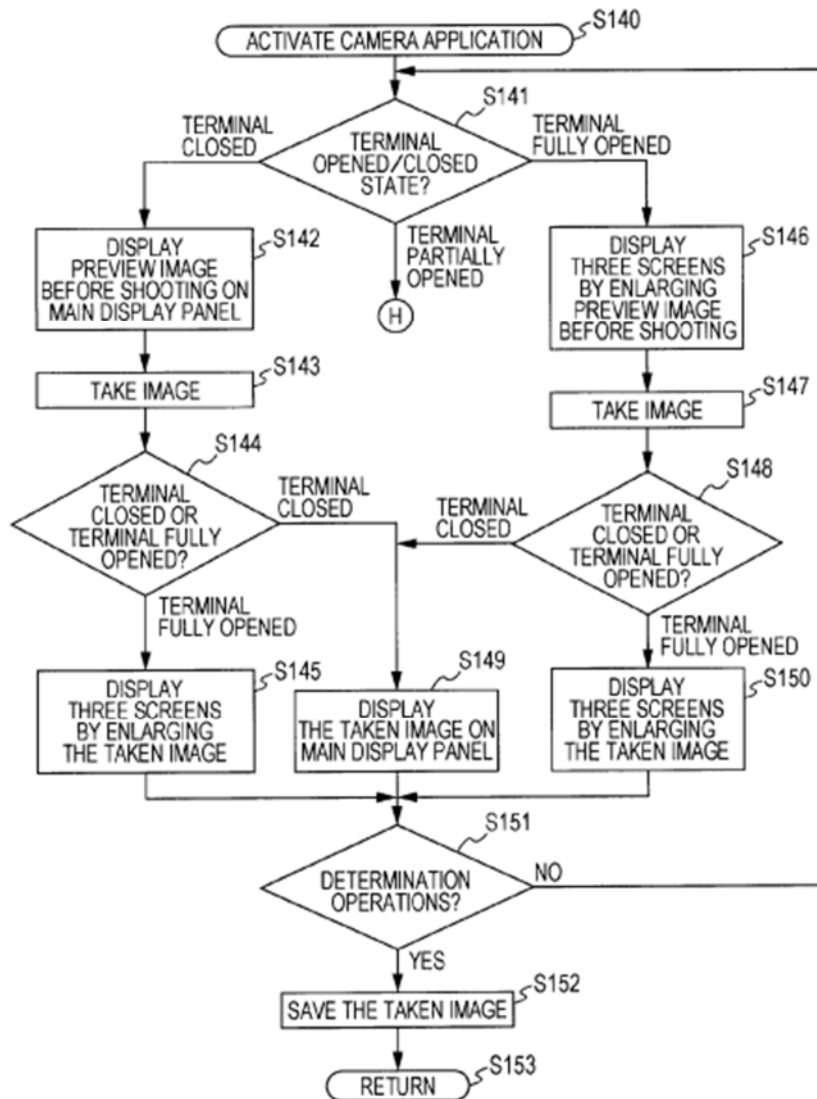
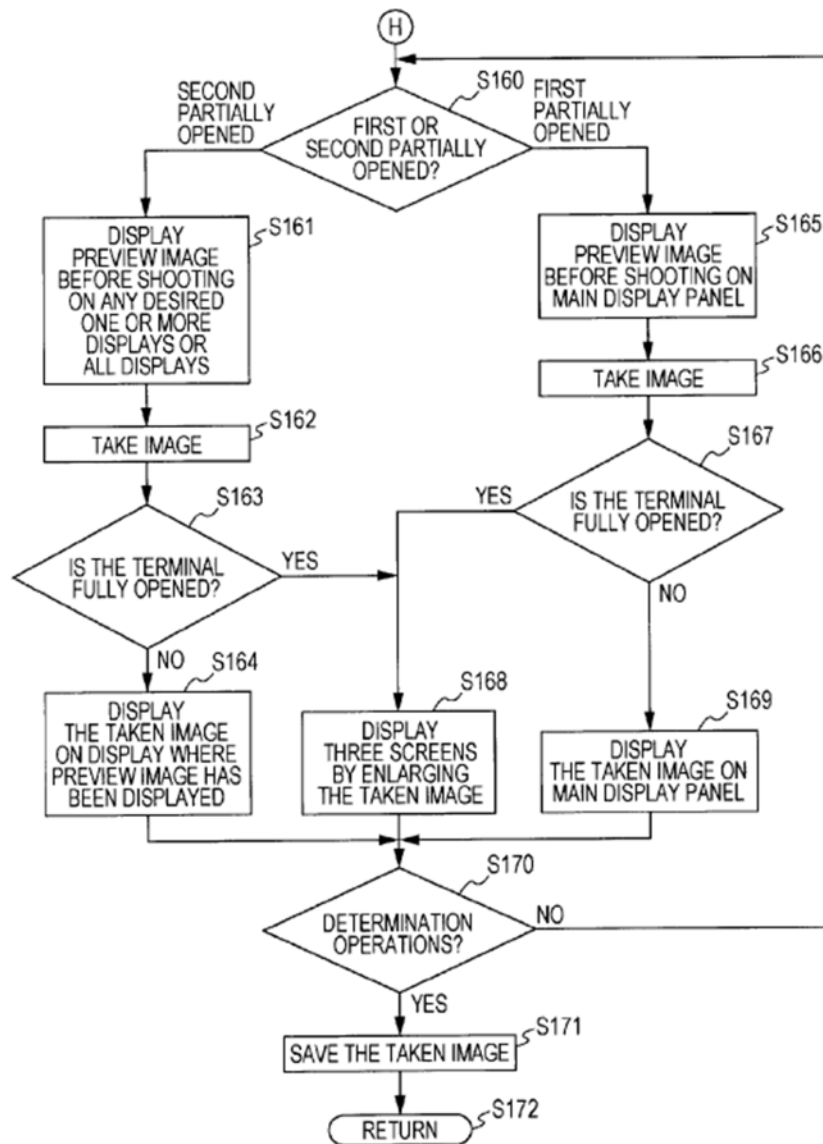


FIG. 61



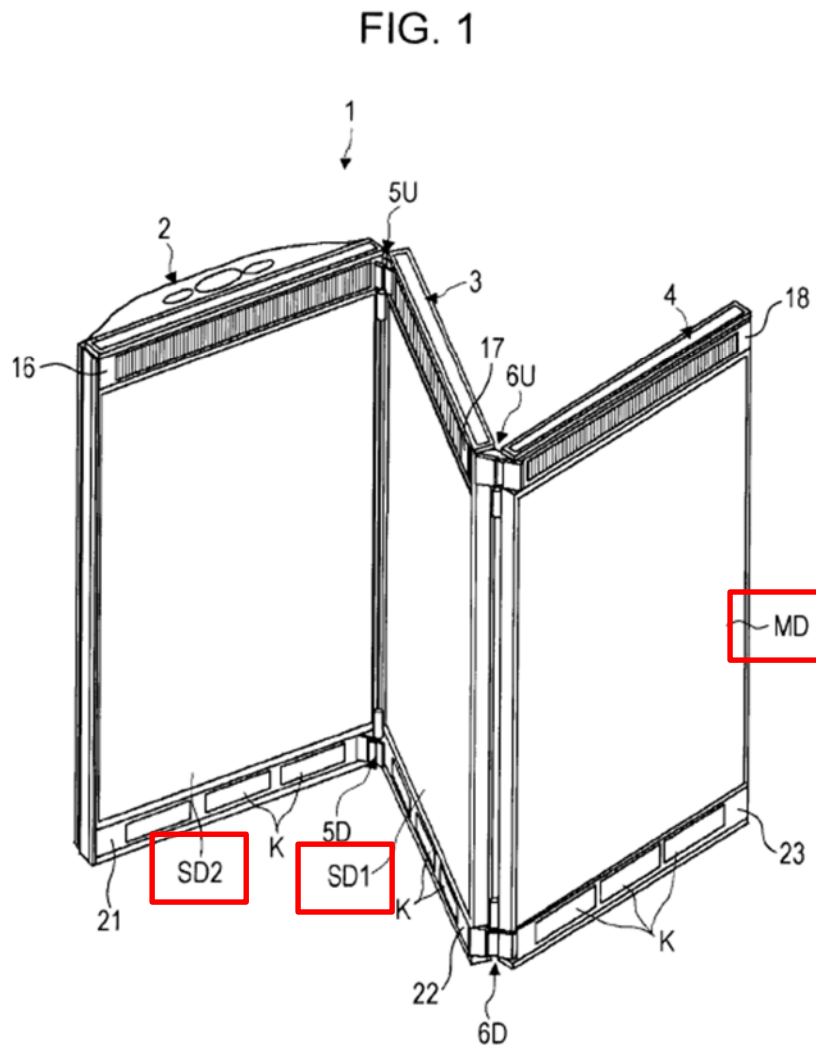
Ex. 1004, Figs. 60-61, [0385]-[0417].

[1A] providing a device having at least first and second screens;

Aono discloses this limitation. Ex. 1003, ¶¶ 65-69.

Aono discloses “a personal digital assistant having multiple screens, and a display control method and display control program of the personal digital assistant.”

Ex. 1004, [0003]. Aono discloses a first casing **2** that includes “a second sub display panel **SD2**,” second casing **3** that includes “a first sub display panel **SD1**,” and a third casing **4** that includes “a main display panel **MD**.” Ex. 1004, [0082]-[0085]. Each of the display panels SD1, SD2, and MD are “made up of a flat display panel such as a liquid crystal display or organic Electro Luminescent (EL) or the like.” *Id.*, [0083]-[0085]. Aono illustrates this in Figure 1:



Ex. 1004, Fig. 1, [0082]-[0085].

A “transparent touch sensor panel” is disposed on the entire surface of each of display panels **MD**, **SD1**, and **SD2**. *Id.*, [0285]. A “touch panel signal processing unit **119** measures the touch detection position, touch path, touch time interval, and so forth from the touch panels **121** and **122**, and transmits the measured data thereof to the control and computing unit **104** as touch detection data.” *Id.* Aono further discloses configuring the device to make calculations and/or execute control programs or applications in response to data processed by the touch panel signal processing unit **119**. *Id.*, [0287].

Aono teaches that the display panels can display a user interface. *Id.*, [0189], [0192], [0241], [0425], [0426]. And, as explained in more detail below with respect to the other limitations of claim 1, each of the three display panels can display a user interface in the form of image and video.

Accordingly, any two of the first, second, or third display panels taught by Aono (that is, display panels **MD**, **SD1**, and **SD2**) are the claimed “first and second screens”—hardware components that provide the device with the ability to render a user interface and/or receive user input. Ex. 1003, ¶ 69.

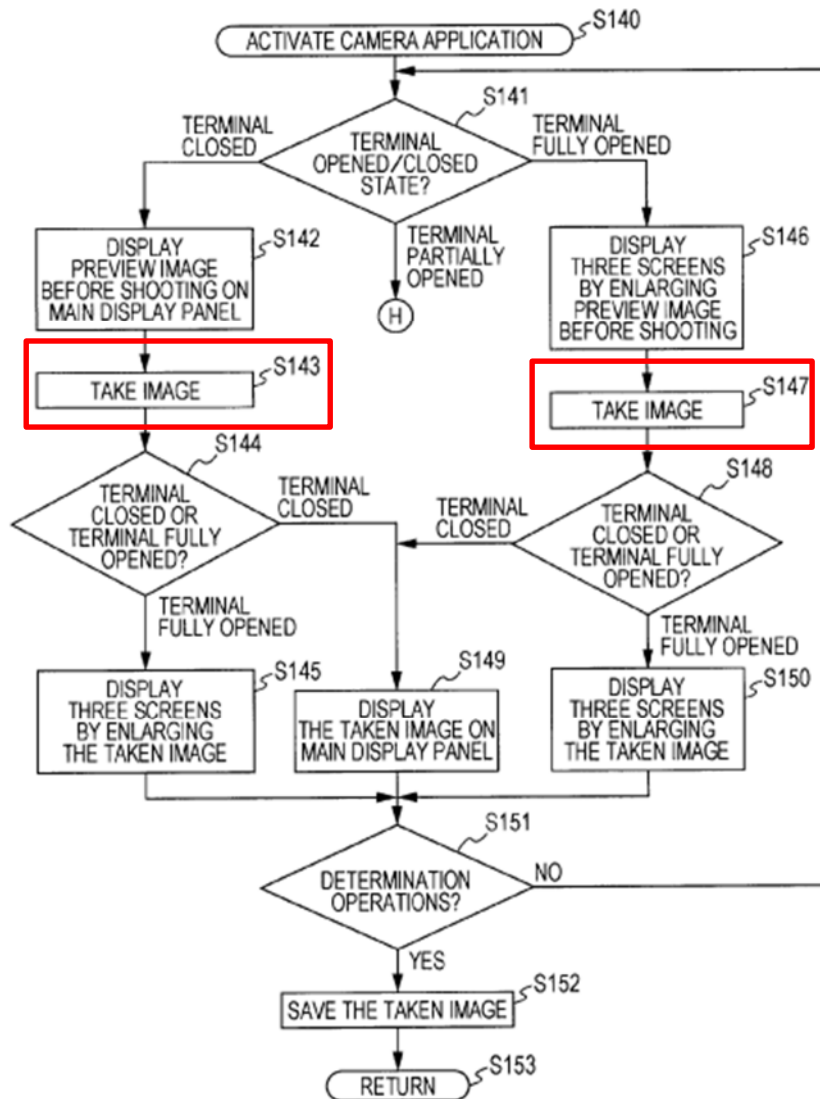
[1B] receiving user interface input to execute an image capture function;

Aono discloses this limitation. Ex. 1003, ¶¶ 70-72.

Aono teaches configuring a device to have a digital camera. Ex. 1004, [0083] (“Also, the first casing 2 also includes a shooting lens **7** for ***digital cameras***, light **8** for emitting extra light for shooting, and a release button **7S** available for releasing at the time of camera shooting . . .”).⁵ Aono further teaches that the digital camera is operable using buttons or touch screens on the device, as described in the discussion of the flowchart in Figure 60:

⁵ All italicized or bold italicized emphasis or color in figures in this Petition is added unless otherwise noted.

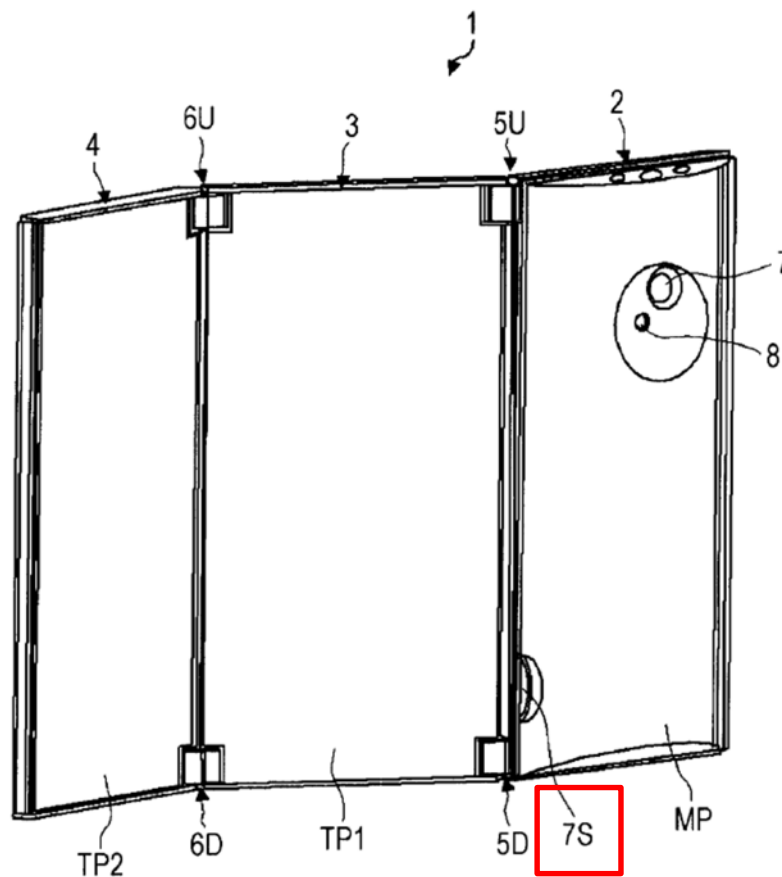
FIG. 60



Ex. 1004, Fig. 60, [0235] (“the personal digital assistant **1** according to the present embodiment is capable of taking an image” . . . and shooting an image may be accomplished “at the time of the release button **7S** being pressed by the user” or “at the time of taking one of the externally exposed pressing keys **K** . . . being pressed by the user” or “at the time of touching to the touch sensor panel . . .”), *Id.*, [0386]

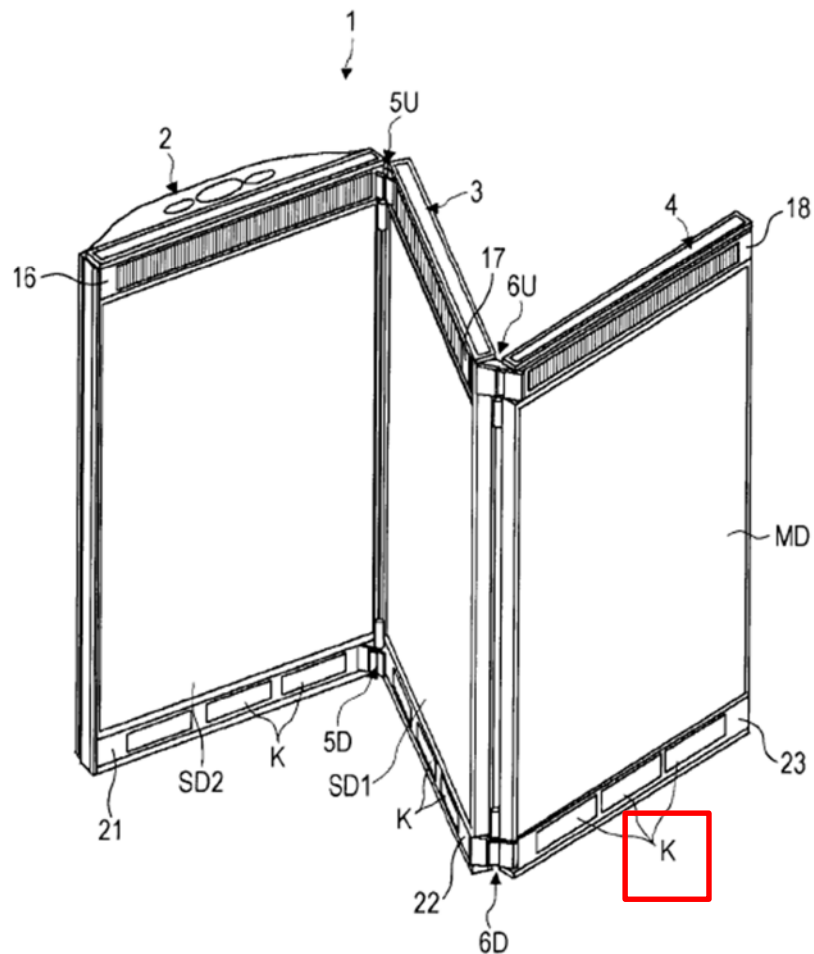
(“the control and computing unit **104** activates a camera application program in step **S140.**”). Aono describes step **S143** as “in the event that the release button **7S** has been pressed by the user . . . the control and computing unit **104** executes shooting processing by the camera.” *Id.*, [0390]. The button **7S** is illustrated in Figure 2:

FIG. 2



Id., Fig. 2. Aono also describes step **S147** as “in the event that one of the pressing keys **K** serving as the release button has been pressed by the user . . . the control and computing unit **104** executes shooting processing by the camera.” *Id.*, [0396]. These keys **K** are illustrated in Figure 1:

FIG. 1



Ex. 1004, Fig. 1. Of note, the Aono device “is capable of taking an image even [*sic*, in] any state of the terminal closed state, first partially opened state, second partially opened state, and terminal fully opened state.” *Id.*, [0235].

Thus, Aono teaches having an “image capture function” (*i.e.*, a digital camera that captures images) that is executed when the device “receiv[es] user interface input” (*i.e.*, pressing a button or touchscreen to operate the digital camera).

[1C] presenting a first display for the image capture function based on a physical device state, a display mode and a device orientation,

Aono discloses, or at least suggests and otherwise would have rendered obvious to a POSITA, this limitation. Ex. 1003, ¶¶ 73-106.

Presenting a first display for the image capture function. Aono teaches presenting a first display for the image capture function of personal digital assistant 1. Figures 60 and 61 illustrate a flowchart for steps for a device according to Aono capturing an image with a digital camera (*i.e.*, an image capture function):

FIG. 60

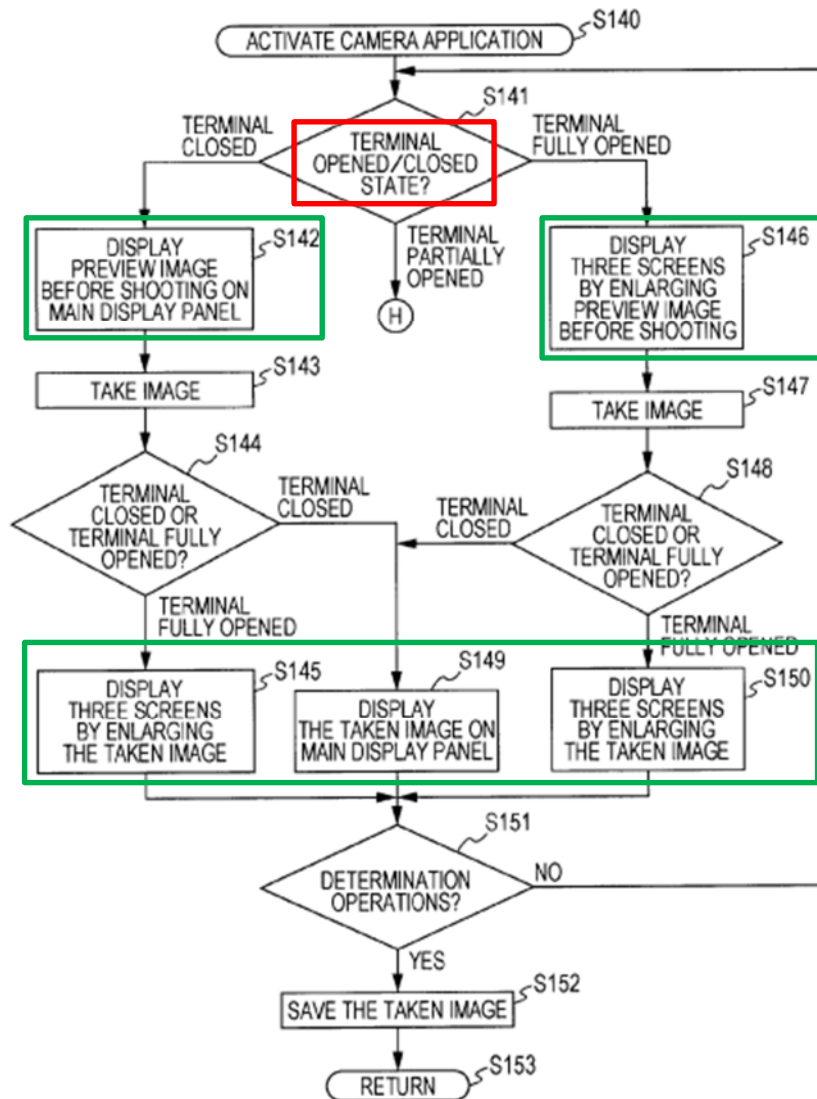
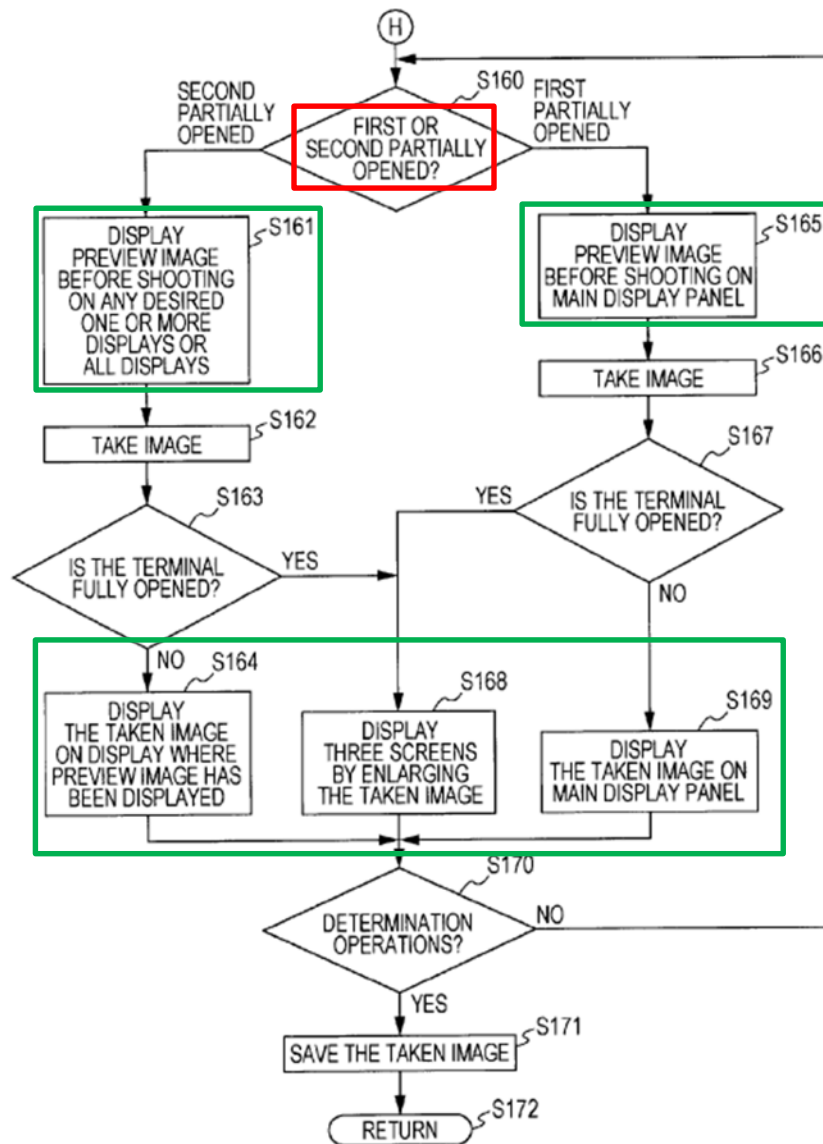


FIG. 61



Ex. 1004, Figs. 60-61, [0385]-[0417]. The flowchart of Figures 60 and 61 is one example of an image capture function according to Aono's teachings. As shown in Figures 60 and 61, after activating the camera application at step **S140**, the devices presents a "display" for the image capture function on one or more of the display

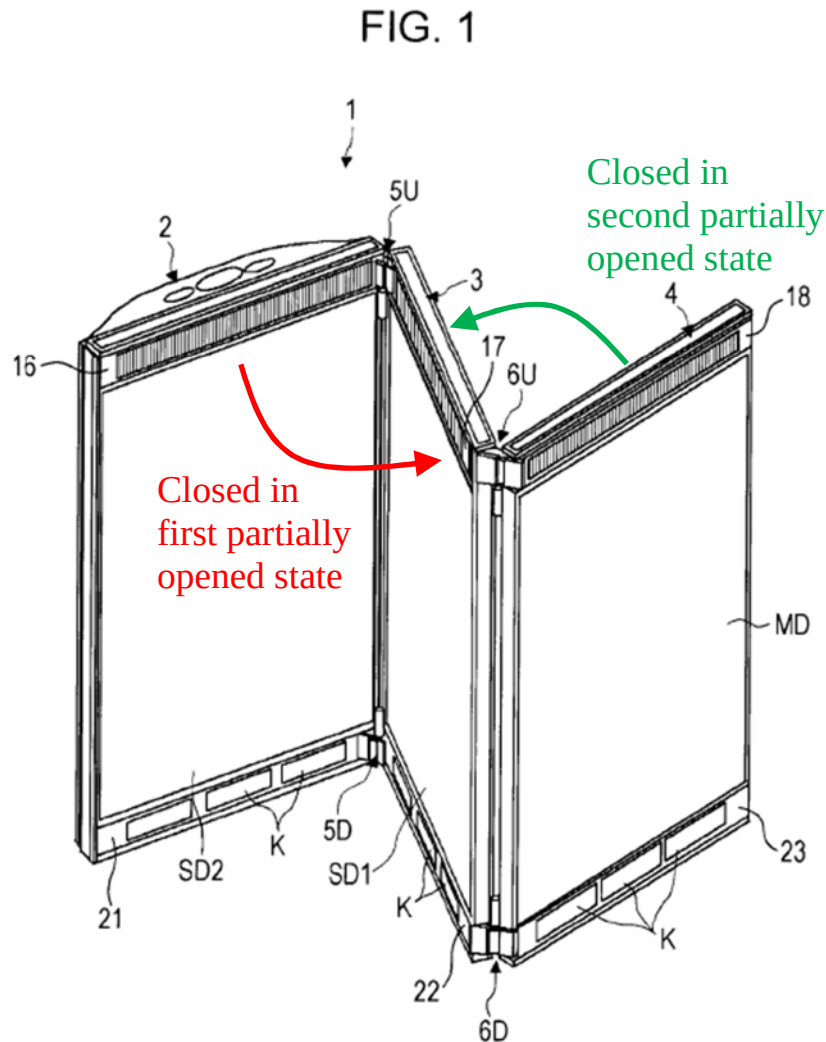
panels **MD**, **SD1**, and **SD2**. *Id.*; *see also* [0231]-[0235] (describing how preview images are displayed in the camera shooting mode); Ex. 1003, ¶ 75.

Aono further teaches, or at least suggests and otherwise would have rendered obvious to a POSITA, that the display depends on (1) whether the device is open, closed, or partially open (“physical device state”), (2) whether the device is configured for the display to occupy one screen or more than one screen (“display mode”), **and** (3) whether the device is in a portrait or landscape orientation (“device orientation”), as explained further below. *Id.*, ¶ 76. Accordingly, Aono teaches, or at least suggests, that the first display for the image capture function is **based on** all three of the physical device state, display mode, and device orientation.⁶

Physical device state. Aono teaches that during an image capture function, the device detects the physical device state: *e.g.*, opened, closed or partially opened (in

⁶ For purposes of this analysis, Petitioners assume that this claim limitation requires the “first display” to be “based on” all three of the physical device state, display mode, and device orientation, and demonstrate how Aono meets this requirement. To the extent that Multifold argues, or the Board determines, that the claim only requires the “first display” to be “based on” one or more of the three listed criteria, then Aono of course also meets the limitation as so construed.

a first or second partially opened device state). *Id.*, Figs. 60-61. A “first partially opened state” is “the state in which the first casing 2 and the second casing 3 are overlaid, and on the other hand, only the third casing 4 is opened.” *Id.*, [0234]. A “second partially opened state” is “the state in which the second casing 3 and the third casing 4 are overlaid, and on the other hand, only the first casing 2 is opened.” *Id.* Figure 1 is annotated below the illustrate a first (red) or second (green) partially opened device state:



Aono further teaches that the personal digital assistant **1** can be configured with sensors, specifically “terminal state detection sensors” such as an “opening/closing detection sensor,” to “detect the opened/closed state between the first casing **2** and the second casing **3**” and “between the second casing **3** and the third casing **4**.” Ex. 1004, [0143]-[0145]. Based on the output of those sensor(s), the control and computing unit **104** of the Aono device determines whether the device is in the closed state, opened state, first partially opened state, or second partially opened state. *Id.*, [0387], [0403]-[0404].

The “physical device states” in Aono are consistent with the ’589 patent’s disclosure of “physical device states,” as explained further below as to limitation [1D]. Ex. 1003, ¶ 79.

Aono teaches that the display presented for the image capture function is based on the physical device state. With reference to Figures 60 and 61, for example, Aono teaches that in the closed and first partially opened states, the device displays a preview image on the main display panel, whereas in the opened state, the device displays a preview image across three screens, and in the second partially opened state, there are a range of options for the display of a preview images across one or more screens. Ex. 1004, [0389], [0395], [0405], [0410].

Display Mode. Aono also teaches having different display modes because images associated with the image capture function can be displayed on a single

screen, on more than one screen, or enlarged across one or more screens, each of which is a different “display mode.” Ex. 1003, ¶¶ 85-88. The annotated Figures 60 and 61, above, identify those steps (in **green**) that determine which display mode the device is in before a photo is taken. For example, in Step **S142**, the device “displays a preview image at the time of camera shooting ***on the main display panel MD***” (Ex. 1004, [0389]), in Step **S146**, the device “enlarges and displays a preview image at the time of camera shooting ***on the three screens*** at the time of the terminal fully opened state” (*id.*, [0395]), in Step **S161**, the device “displays a preview image at the time of the camera shooting ***on one or more display panel*** or all of the display panels” (*id.*, [0410]), and in Step **S165**, the device “enlarges and displays a preview image at the time of the camera shooting ***on the main display panel MD***” (*id.*, [0405]). Figures 60 and 61 also identify the display mode the device is in after a photo is taken. *See id.* [0392].

Aono teaches that the display presented for the image capture function is based on the display mode (*i.e.*, which display(s) are operable to show a preview image and whether or not the image is displayed in an enlarged format, as discussed in the preceding paragraph). Ex. 1003, ¶ 88. Of particular note, when in the “second partially opened state,” different display modes are possible: “in the event that determination is made in step **S160** that the state of the terminal is the second partially opened state, the control and computing unit **104** displays a preview image

at the time of the camera shooting on one or more display panel or all of the display panels which the user desires of the three display panels.” Ex. 1004, [0410]. That is, in the physical device state of “second partially opened state,” the display mode could be (i) displaying a preview image on panel **MD**, (ii) displaying a preview image on panel **SD1**, (iii), displaying a preview images on panel **SD2**, (iv) displaying a preview image on each of panels **MD** and **SD1**, and so on for all the different permutations of the three display panels. Ex. 1003, ¶ 88. Accordingly, to the extent that limitation 1[D] is interpreted to require that the “display mode” be determined independently from the “physical device state,” Aono meets that requirement.

The “display modes” in Aono are consistent with the ’589 patent’s disclosure of “display modes,” as explained further below as to limitation [1D]. That is, the ’589 patent describes different “display modes” as being different display of an image or images on or enlarged across one or more screens. Ex. 1003, ¶ 86.

Device Orientation. Aono also teaches that the personal digital assistant **1** can be configured to have, and detect changes in, device orientation. Ex. 1003, ¶¶ 89-99. The personal digital assistant **1** includes sensors such as “a horizontal/vertical detection sensor, a direction detection sensor, a position detection sensor, an acceleration detection sensor . . . and further other various sensors.” Ex. 1004, [0143].

Aono further teaches that the display mode will be different depending on whether the personal digital assistant **1** is in a landscape or portrait orientation. Figures 26 and 27 illustrates a display mode that displays images according to the opened or closed state of the terminal based on what the terminal state detection sensor detects, consistent with what is described above with respect to “physical device state.” *Id.*, [0149].

Aono goes on to explain though that what is displayed *also* is based on the device orientation, not just the physical device state. As one example, Figures 26 and 27 display an image (*e.g.*, a video) across one and three screens, respectively with an aspect ratio of 16:9.

FIG. 26

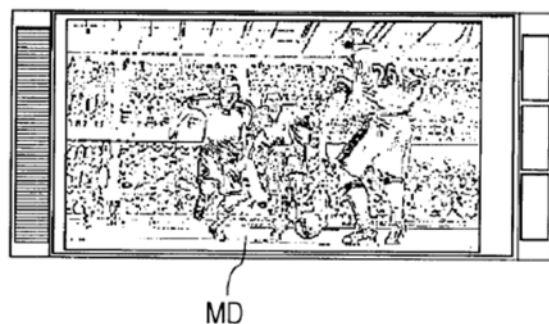
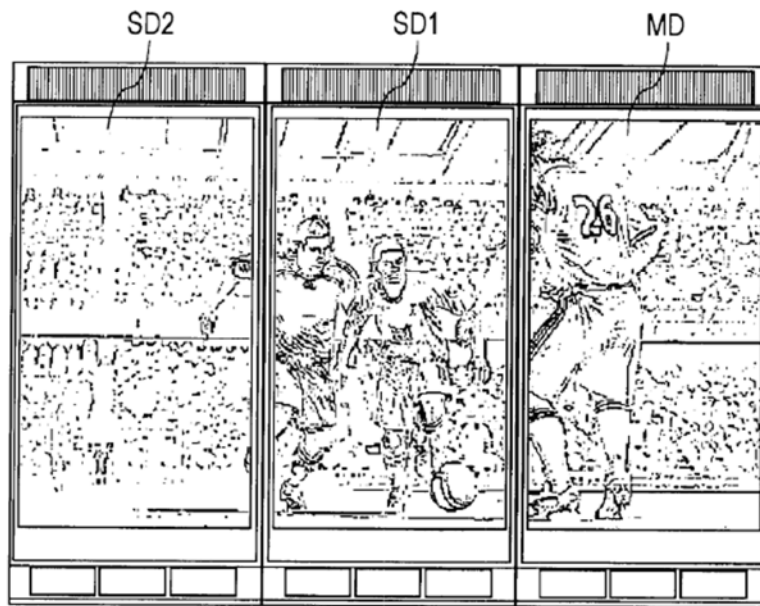


FIG. 27



Id., Fig. 26, [0151]-[0153]. Aono discloses Figure 26 as “a landscape video” and Figure 27 as a “landscape enlarged video.” *Id.*, [0040], [0153].

Aono then notes that the display changes if the device is in portrait orientation: “It goes without saying that an example is also the same as with the above wherein in the terminal closed state, a portrait video corresponding to an aspect ratio of 9:16 is displayed with the long direction of the main display panel **MD** as perpendicular, and in the terminal opened state, a portrait enlarged video corresponding to an aspect ratio of generally 9:16 is displayed by arraying the three screens in the vertically longitudinal direction as viewed from the user.” *Id.*, [0153]. The description of “portrait” and “landscape” in Aono is consistent with how “landscape” and

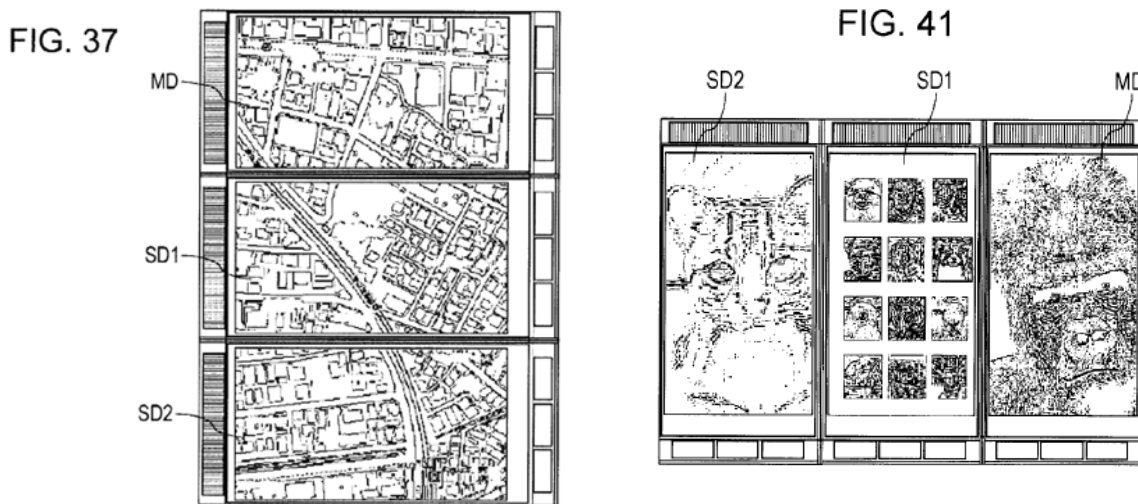
“portrait” orientations are used in the ’842 patent and how the terms are generally understood in the art. Ex. 1001, 3:42-57 (describing, with reference to displays, that “landscape” is where “the display is oriented such that the width of the display is greater than the height of the display”); Ex. 1003 ¶¶ 91-92.

Aono gives another example of how the display changes based on the device orientation: “the personal digital assistant 1 according to the present embodiment may perform operation control such as ***switching to enlarged display of the three screens from the one screen only at the time of transition of the horizontal/vertical state of this terminal*** based on detection output of, for example, a horizontal/vertical detection sensor, direction detection sensor, acceleration sensor, or the like.” *Id.*, [0154].

Aono also describes how the device sense device rotation and changes its display accordingly with respect to a “schematic internal configuration example” of the personal digital assistant 1 in Figure 50. *Id.*, [0272]-[0288]. This includes a “storage medium” storing the “display control program for controlling display of the personal digital assistant.” *Id.* [0278]. That program causes the control and computing unit to execute processing for displaying video on the display panel(s) differently based on the “horizontal and vertical direction of this terminal.” *Id.* For example, depending on whether the aspect ratio of the opened displays and a predetermined aspect ratio are “generally match[ed]” or “***rotated generally 90***

degrees,” video is displayed on all open display panels or one display panel. *Id.* Of note, the “preview image” in the image capture operation of the device is displayed “as preview video data,” (*Id.*, [0281]) and thus would be displayed differently based on the device’s rotation in accordance with the disclosures of paragraph [0278]. Ex. 1003 ¶ 98.

Aono provides various illustrations of a display mode that displays images with the device in a portrait orientation, *e.g.*, Figure 37 (showing an image stretched across three screens in a portrait orientation). Aono also shows, in Figure 41 showing two separate images and an image list on the three screens, with the images in portrait orientation on the displays and the overall device in landscape orientation:



Id., Figs. 37 and 41, [0203], [0208], [0225]-[0227].

A POSITA would have understood all the disclosures discussed with respect to this limitation [1C] to be part of, and describing, one embodiment. Ex. 1003, ¶

101. Aono describes various “operation control examples” of the *same* device, the “personal digital assistant 1 according to ***the present embodiment.***” Ex. 1004, [0148]. Aono teaches that the personal digital assistant 1 “is configured so as to perform various types of terminal operation control which will be described later based on the detection results by the terminal state detection sensors.” *Id.* The disclosures cited above with respect to this claim limitation all describe aspects of the “operation control” of this device.

To the extent that it is deemed that the disclosures discussed with respect to this limitation relate to different embodiments of Aono, although such an interpretation would be wrong, a POSITA nonetheless a minimum would have found it obvious to combine different disclosures of Aono in the manner described above. “Combining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness.” *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991 (Fed. Cir. 2009). From the disclosures cited above with respect to this limitation, a POSITA would have understood that all three of physical device state, device orientation, and display mode can be changed while using the device to capture images and that the image capture mode would take all three of these factors into account to properly display preview images when using Aono’s image capture function. Ex. 1003, ¶ 102.

Specifically with respect to the “device orientation” disclosures, a POSITA would have understood that, first, a device such as Aono’s portable digital assistant **1** could be turned to be in different orientations, and second, that Aono at least suggests and would have rendered obvious to a POSITA that the display on the screen or screens would be based on and change depending on the device orientation in the various modes of operation of Aono, including image capture modes. Ex. 1003, ¶ 103. In Figures 26 and 27 and the accompanying “first operation control mode,” Aono expressly discloses that the display of an image or video on a screen(s) will change depending upon whether the device is in portrait or landscape mode. Ex. 1003, ¶ 104; Ex. 1004, [0149]-[0154]. A POSITA would have understood that the same would be true for the camera shooting modes of Aono’s portable digital assistant **1** (*e.g.*, as described in the “ninth operation control example” shown in Figures 60 and 61), or at least that would have been the most obvious way to implement the camera shooting modes. Ex. 1003, ¶¶ 105-106. The camera shooting modes discuss the display of preview images (preview video data). Ex. 1004, [0281], [0385]-[0415]. Thus, a POSITA would have understood that these preview images / videos would change display upon a device orientation change, just like other images / videos as discussed with respect to Figures 26 and 27. Ex. 1003, ¶¶ 105-106.

[1D] the physical device state at least including open, closed easel⁷ or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max;

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation.⁸ Ex. 1003, ¶¶ 107-118.

⁷ Petitioners assume that Claim [1D] reciting a “closed easel” physical device state is a clerical error (missing comma between “closed” and “easel”) and that the applicant instead intended to claim separate “closed” and “easel” physical device states. This assumption is supported by the specification, which never references a “closed easel” physical device state but repeatedly refers to separate “closed” and “easel” physical device states. *See* Ex. 1001, Figs. 3A, 3B, 9:25-53, 10:35-39, 13:9-50, 14:11-13, 23:5-8, 23:16-20, 23:62-67, 24:4-8, 24:36-38, 24:42-51, 33:7-11, 33:26-28, 33:38-40, 34:47-52. To the extent that limitation [1D] is read to mean a “closed easel,” Aono discloses and renders this limitation for the same reasons as for the “closed” and “easel” states. Ex. 1003, ¶ 107 n.1.

⁸ For purposes of this analysis, Petitioners assume that this claim limitation requires the “physical device state” to include all the listed states, and likewise assume that the “display mode” includes all the listed modes, and demonstrate how Aono meets these requirements. To the extent that Multifold argues, or the Board determines,

Physical device state. The '589 patent describes various physical device states, including open, closed, easel, and modified easel, and illustrates these physical device states in Figure 3A. Ex. 1001, Fig. 3A, 13:21-24 (“In state **304**, the device is in a **closed state** with the device **100** generally oriented in the portrait direction with the primary screen **104** and the secondary screen **108** back-to-back in different planes”), 13:50-53 (“Upon entering the **easel state 312**, the primary screen **104** and the secondary screen **108** are separated from one another such that, for example, the device **100** can sit in an easel-like configuration on a surface.”), 13:54-59 (“In state **316**, known as the **modified easel position**, the device **100** has the primary screen **104** and the secondary screen **108** in a similar relative relationship to one another as in the easel state **312**, with the difference being one of the primary screen **104** or the secondary screen **108** are placed on a surface as shown.”), 13:60-61 (“State **320** is the **open state** where the primary screen **104** and the secondary screen **108** are generally on the same plane.”).

Aono teaches each of the four device states. Examples are below:

that the claim may be satisfied if the “physical device state” and/or the “display mode” only include one or more of the listed states or modes, then Aono of course also meets the limitation as so construed.

1. In the “terminal opened state,” illustrated in Aono Figure 5, “the three screens are arrayed generally in parallel generally in the same lateral direction, and a generally flat screen can be realized by these three screens.” Ex. 1004, Fig. 5. This is the same as the ’589 “open” device state, because the screens are in the same plane. Ex. 1003, ¶¶ 110-111. As another example, the “second partially opened state” can be configured as an “open” state where the second casing **3** (containing **SD1**) and the first casing **2** (containing **SD2**) are in the same plane (and visible to the user), consistent with the ’589 patent’s description of “open state.” *See infra* Claims 2 and 3.

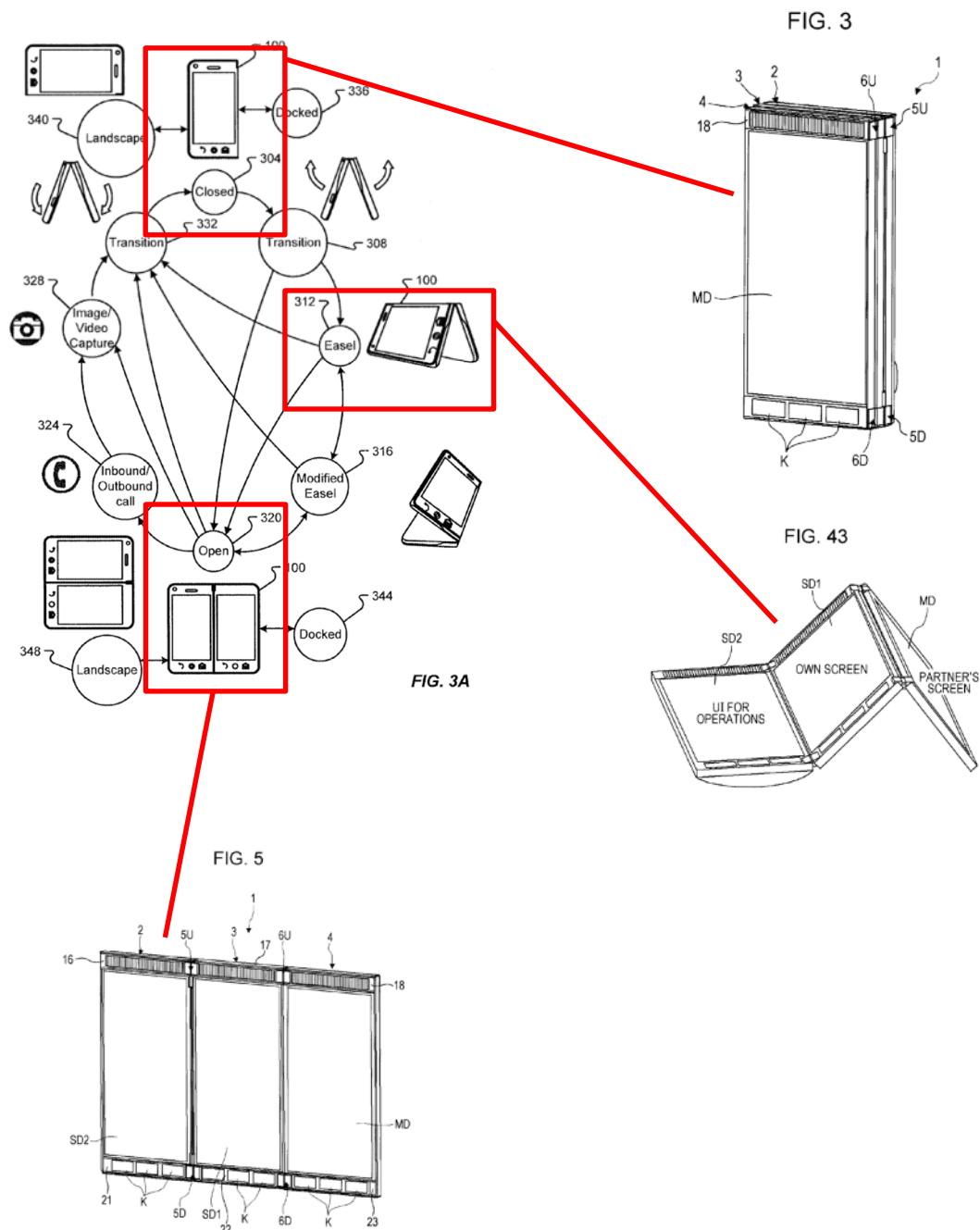
2. In the “terminal closed state,” “as illustrated in FIG. 3, from an angle (generally 0 degree) where both display panel surfaces are generally parallel by both display panel surfaces of the first casing **2** and second casing **3** fully facing each other.” *Id.*, Fig. 3, [0099], [0102]. This is the same as the ’589 “closed” device state, because two of the screens (specifically, MD and SD1) are back-to-back in different planes. Ex. 1003, ¶ 112.

3. Aono also teaches the “easel” state disclosed in the ’589 patent. Aono teaches a “first partially opened state” is “the state in which the first casing **2** and the second casing **3** are overlaid, and on the other hand, only the third casing **4** is opened.” *Id.*, [0234]. A “second partially opened state” is “the state in which the second casing **3** and the third casing **4** are overlaid, and on the other hand, only the

first casing **2** is opened.” *Id.* Both of these states teach an “easel” configuration: the two screens are separated from one another such that, for example, the personal digital assistant **1** can sit in an easel-like configuration on a surface. Ex. 1003, ¶ 113. Figure 43 of Aono is another example of how Aono’s device can be configured as the “easel” physical device state from the ’589 patent. *Compare* Ex. 1001, Fig. 3A *with* Ex. 1004, Fig. 43.

4. If the term “modified easel” is interpreted to mean that one of the screens can be used as a stand and is faced down on the surface of an object (such as a table) (*see* Ex. 1001, Fig. 1J, 9:54-57), the foregoing disclosures of Aono disclose such a position. Ex. 1003, ¶ 114. In particular, in the “second partially opened state,” “the second casing **3** and the third casing **4** are overlaid, and on the other hand, only the first casing **2** is opened.” Ex. 1004, [0234]. “[T]he second casing **3** and the third casing **4** are overlaid by the first texture panel **TP1** and the second texture panel **TP2** generally fully facing to each other, the main display panel **MD** is also available as a shooting angle variable monitor.” *Id.* So, in this configuration, the screen **MD** would be facing outward and, when the device is placed on an object, the screen **MD** would be used as a stand, faced down. Ex. 1003, ¶ 114.

The physical device states are illustrated in annotated Figure 3A from ’589 patent and Figures 3, 5, and 43 from Aono, below.



To the extent Multifold contends, incorrectly, that Aono does not disclose any one or more of the listed “physical device states,” at minimum Aono suggests and would have rendered obvious to a POSITA a device that can be configured in these states. Ex. 1003, ¶¶ 115-117. Aono makes clear that the disclosed personal digital

assistant **1** embodiment is just exemplary; to the contrary, the physical configuration of the device could be different: “It goes without saying that the content described in the present embodiment is consistently an example, the number of display panels is not restricted to three surfaces, *how to fold and unfold a casing and a display panel is not restricted to folding and unfolding of a later-described folding screen type*, and *further the shapes and number of components making up the personal digital assistant are also not restricted.*” Ex. 1004, [0080]. Accordingly, a POSITA would have been motivated by Aono’s express teachings to construct a device that would fold/unfold and be configured physically in different ways, including in “open,” “closed,” “easel,” and “modified easel” type configurations, and a POSITA would have reasonably expected success in making such modifications (if necessary) to the personal digital assistant **1** embodiment. Ex. 1003, ¶ 117.

Display mode. Aono discloses, or at least suggests and would have rendered obvious to a POSITA, each of the six “display modes” recited in this limitation of claim 1.

1. The ’589 patent teaches that in the “portrait max” display mode, illustrated in Figure 6I, “the device **100** may be configured to present a single continuous image across both touch sensitive displays **110**, **114** in a portrait configuration.” Ex. 1001, Fig. 6I, 24:60-65. Aono teaches a “portrait max” display mode in Figure 27 because each screen is in a portrait orientation and the image

displayed is presented as a continuous image across all screens. *Compare* Ex. 1001, Fig. 6I with Ex. 1004, Fig. 27:

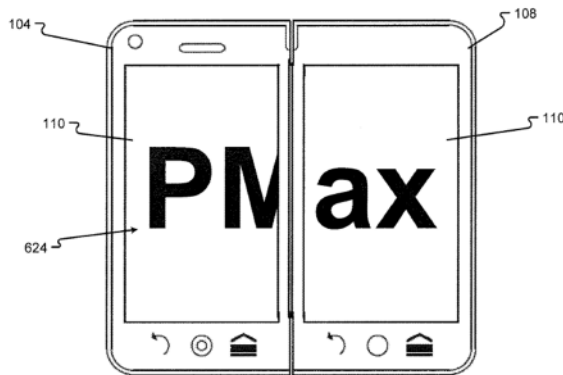
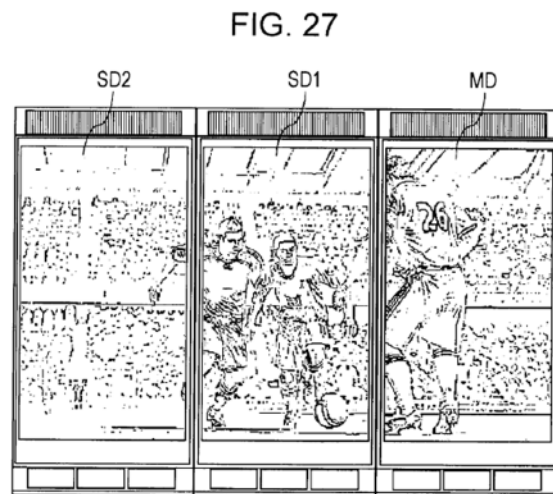


FIG. 6I



2. The '589 patent also teaches that in the “landscape max” display mode, illustrated in Figure 6J, “the device **100** may be configured to present a single continuous image across both touch sensitive displays **110**, **114** in a landscape configuration referred.” Ex. 1001, Fig. 6J, 25:9-14. Aono teaches a “landscape max” display mode in Figure 37 because each screen is in a portrait orientation and the image displayed is presented as a continuous image across all screens. *Compare* Ex. 1001, Fig. 6J with Ex. 1004, Fig. 37⁹:

⁹ To the extent that “portrait max” is interpreted such that it refers to the overall image in portrait configuration stretched across three screens, then Aono discloses

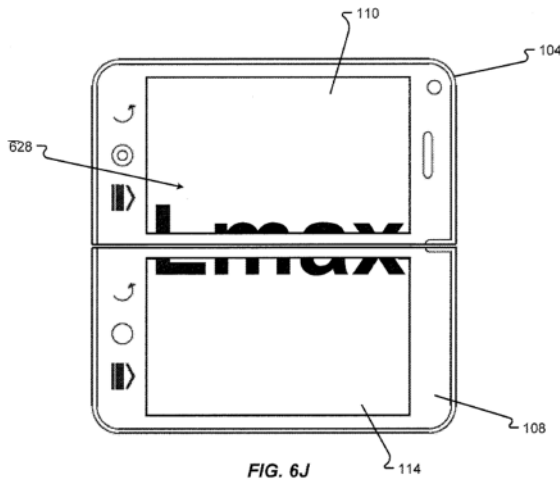
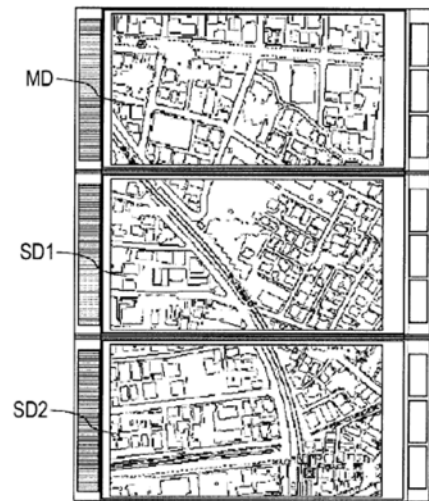


FIG. 37



3. Aono also discloses both “portrait single” and “landscape single” display modes. Aono discloses displaying an image on just a single screen. For example, as described with respect to Figures 60 and 61, a preview image is shown on just the “main display panel” in the “terminal closed” and “first partially opened” states. Ex. 1004, Figs. 60 and 61, [0389], [0405]. As another example, an image is shown on just a single screen in Figures 26, 35, and 39 of Aono. Ex. 1004. And, as described above with respect to limitation [1C], the Aono device can be oriented in

“portrait max” (e.g., Figure 37). Likewise, to the extent “landscape max” is interpreted such that it refers to the overall image in landscape configuration stretched across three screens, then Aono discloses “landscape max” (e.g., Figure 27).

both portrait and landscape modes such that it is capable of both “portrait single” and “landscape single” display modes. Ex. 1003, ¶ 118(c). Aono’s disclosures are consistent with the ’589 patent’s disclosures of “portrait single” and “landscape single” displays. *Id.*

4. The ’589 patent teaches “dual” display modes, *e.g.*, “Dual-Portrait” (PD) and “Dual-Landscape” (LD). Ex. 1001, Figs. 6C, 6F, 23:32-37, 24:20-24. Aono likewise discloses “dual” display modes where images are displayed on two (or more) of the display units, but in contrast to the “max” display modes, one image is not stretched across two or more screens. Examples in Aono include Figures 28-33 and 41-42. Ex. 1004; Ex. 1003, ¶ 118(d). A POSITA further would have understood and found obvious from Aono’s disclosure that the “camera shooting mode” as described in the “ninth operation control” would, in the case of at least the “second partially opened” state, display a preview image on one or more of the display panels in a “dual” configuration as desired by the user. *Id.* And, as described above with respect to limitation [1C], the Aono device can be oriented in both portrait and landscape modes, and accordingly, the Aono device is capable of both “portrait dual” and “landscape dual” display modes. *Id.*

[1E] receiving a device orientation change, wherein the device orientation change is a rotation of the device; and

Aono discloses this limitation. Ex. 1003, ¶¶ 118-121.

Aono teaches that the personal digital assistant **1** can be configured to have, and detect changes in, device orientation. Ex. 1003, ¶ 120. The personal digital assistant **1** includes sensors such as “a horizontal/vertical detection sensor, a direction detection sensor, a position detection sensor, an acceleration detection sensor . . . and further other various sensors.” Ex. 1004, [0143]. Aono further teaches the change in device orientation being the result of “rotation of the device,” *i.e.* transition of the terminal horizontal/vertical state. *See id.*, [0153]-[0154]; *see also* [0278] (discussing a 90 degree rotation of the device).

[1F] based on the device orientation change, the device state and the display mode, presenting a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.

Aono discloses this limitation. Ex. 1003, ¶¶ 122-125. As discussed above with respect to limitations [1C] and [1F], the personal digital assistant **1** includes sensors such as “a horizontal/vertical detection sensor, a direction detection sensor, a position detection sensor, an acceleration detection sensor . . . and further other various sensors.” Ex. 1004, [0143]. In addition, “the personal digital assistant **1** according to the present embodiment may perform operation control such as switching to enlarged display of the three screens from the one screen ***only at the time of transition of the horizontal/vertical state*** of this terminal based on detection output of, for example, a horizontal/vertical detection sensor, direction detection

sensor, acceleration sensor, or the like.” *Id.*, [0154]. As discussed above with respect to limitation [1C], paragraphs [0278] and [0281] of Aono describes another example of how the display of preview video in the image capture mode changes on the first and second screens based on the device being “***rotated generally 90 degrees.***”

In addition to the device orientation change, the personal digital assistant **1** otherwise determines the images to display according to the flowcharts in Figures 60 and 61, which consider the physical device state, display mode, and device orientation:

FIG. 60

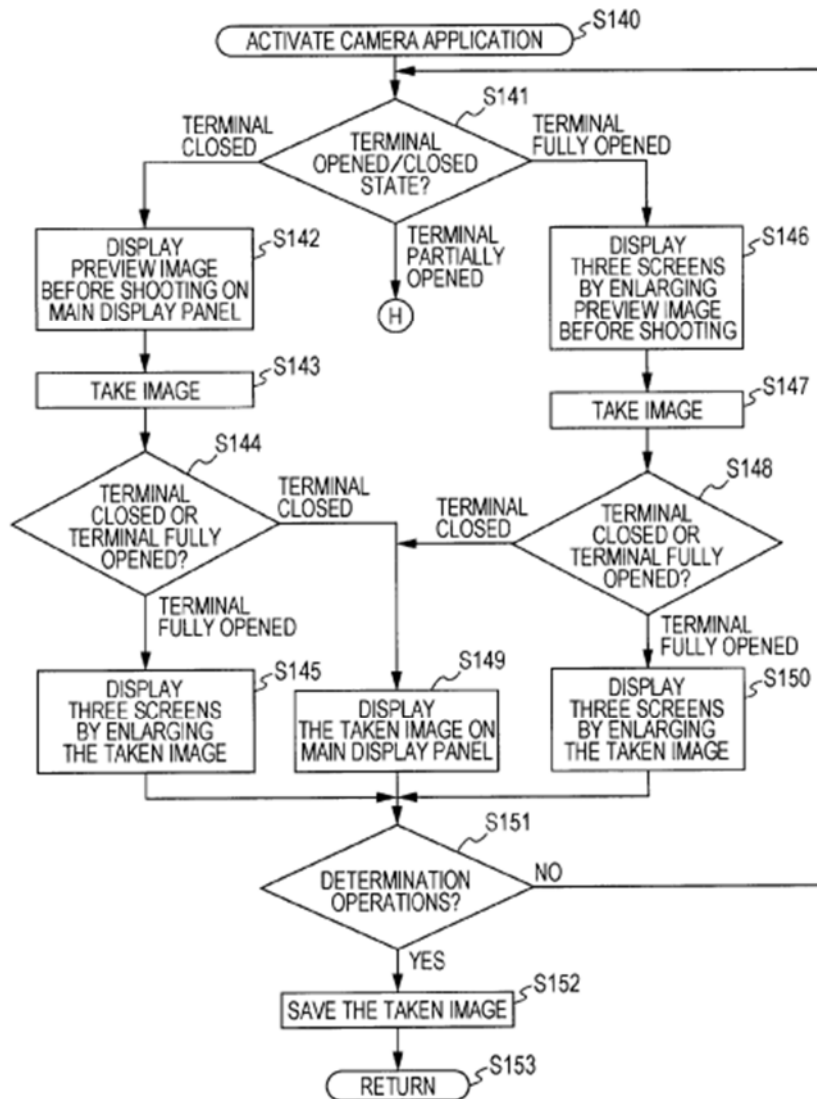
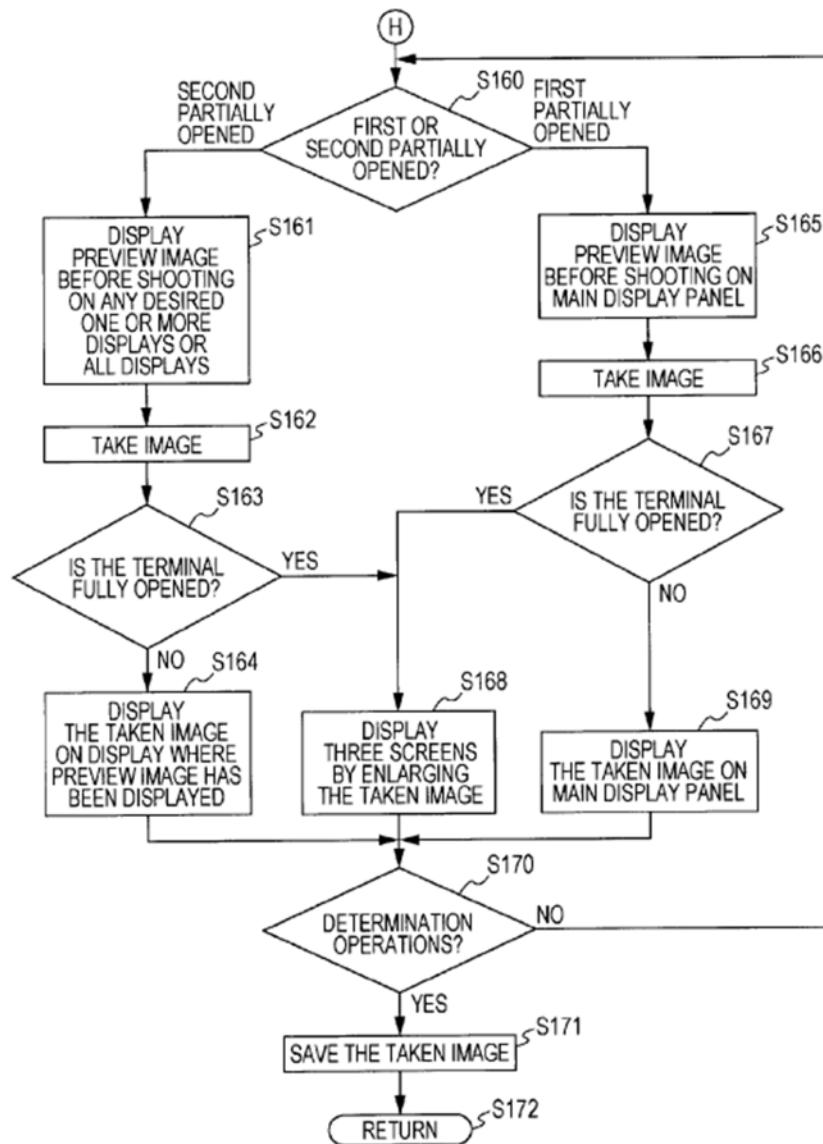


FIG. 61



Id., Figs. 60 and 61; *see also* Claim [1C] *supra*. Aono also teaches a portion of the first and second screen changing from the first display to the second display when, in response to an orientation change, the displayed images changes from appearing on one screen to being stretched across three screens, as illustrated in, *e.g.*, Figures 26 and 27:

FIG. 26

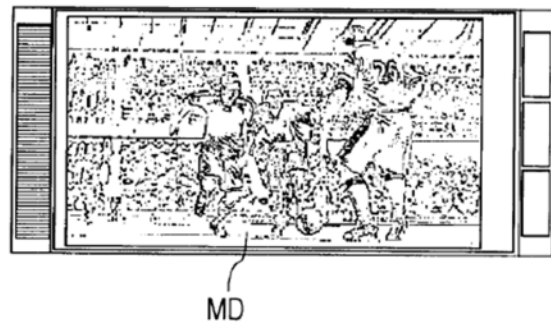
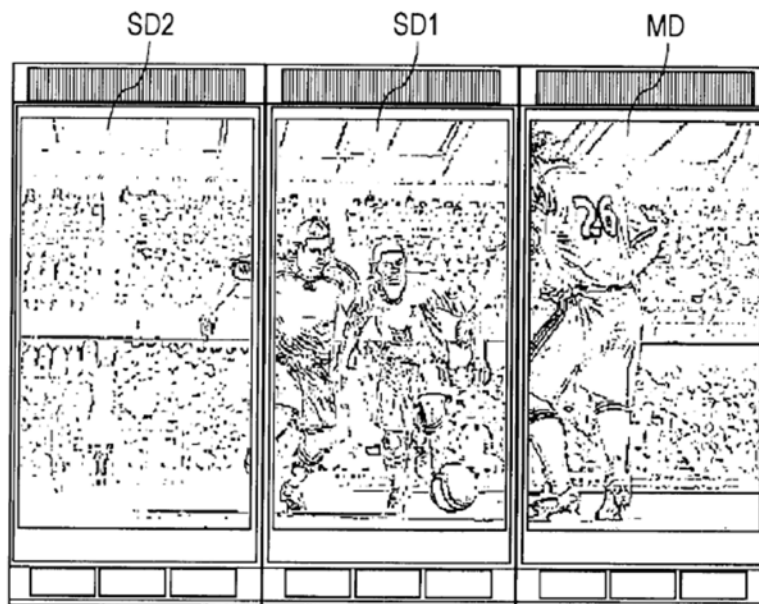


FIG. 27



Id., Figs. 26-27, [0152]-[0154]. As shown, and as a POSITA would have understood, the Aono personal digital assistant 1 has been rotated (a “device orientation change”) between Figures 26 and 27. Ex. 1003, ¶ 125.

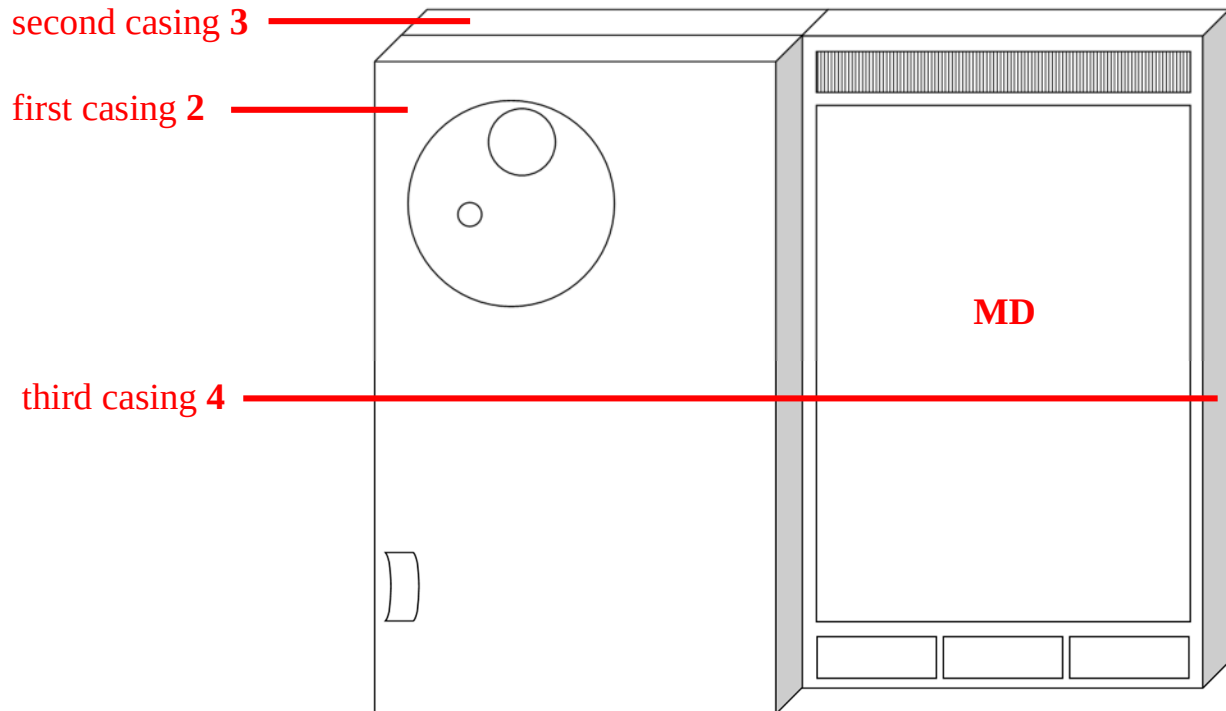
2. Claim 2

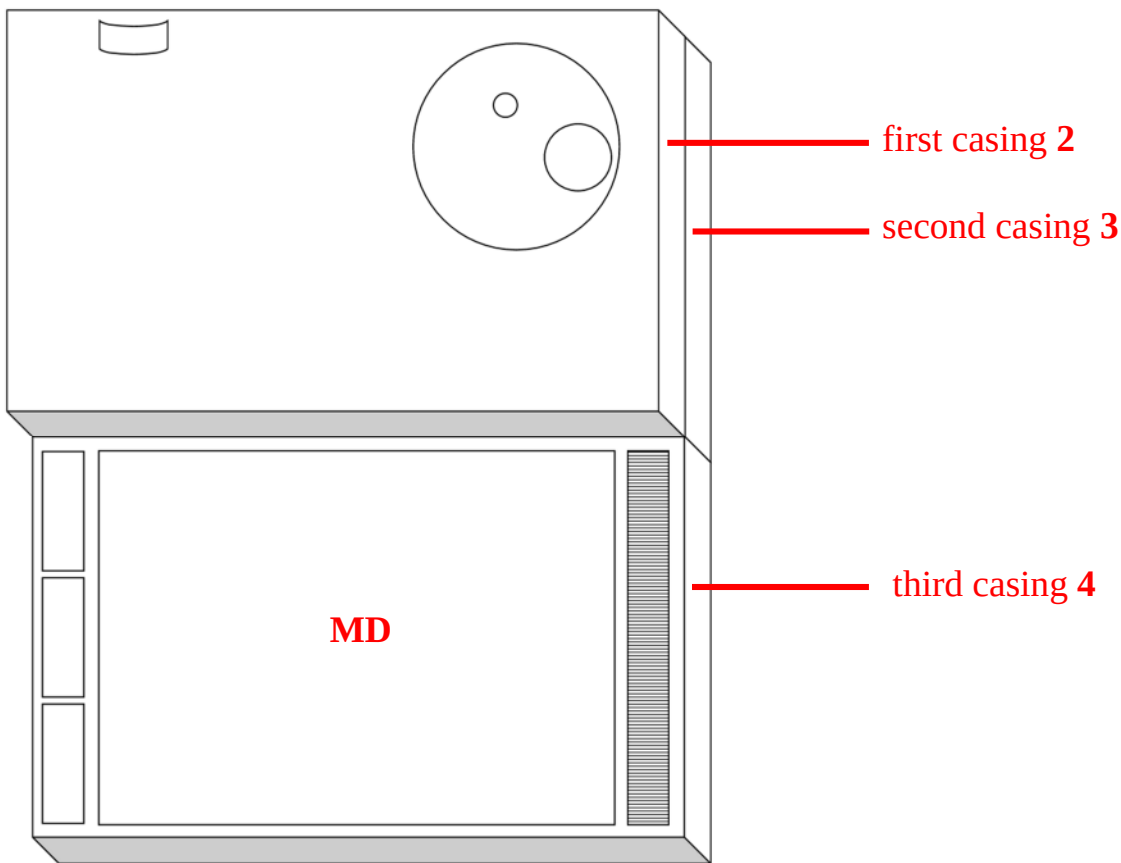
[2] The method of claim 1, wherein the image capture function is configured to capture an inward-facing image.

Aono discloses the additional limitations of claim 2 and thus at least would have rendered obvious to a POSITA claim 2. Ex. 1003, ¶¶ 126-131. Aono teaches configuring the personal digital assistant 1 to shoot self-portraits with the camera. Ex. 1004, [0233] (“Particularly, with the camera shooting mode such as this ninth operation control example, in the event that the shooting angle is set to the above generally 180 degrees, it is possible to take the user himself/herself of this terminal by the shooting lens 7, i.e., to ***shoot a self-portrait.***”) A POSITA would have understood that such a “self-portrait” shooting configuration is a configuration to capture an “inward-facing image.” Ex. 1003, ¶ 128. This is consistent with the ’589 patent’s disclosure: Ex. 1001, 36:6-8, Fig. 20 (“While in the dual screen orientation, the image capture function 1100 presents an inward facing image 2004 and may be in a self-portrait mode.”)

In this example of Aono, the device is configured to take a “self-portrait” (inward-facing image) in the “first partially opened state”: where display panels SD1 and SD2 are facing each other, and display panel MD is opened and available as a “shooting angle variable monitor.” Ex. 1004, [0233]-[0234], [405]. The following

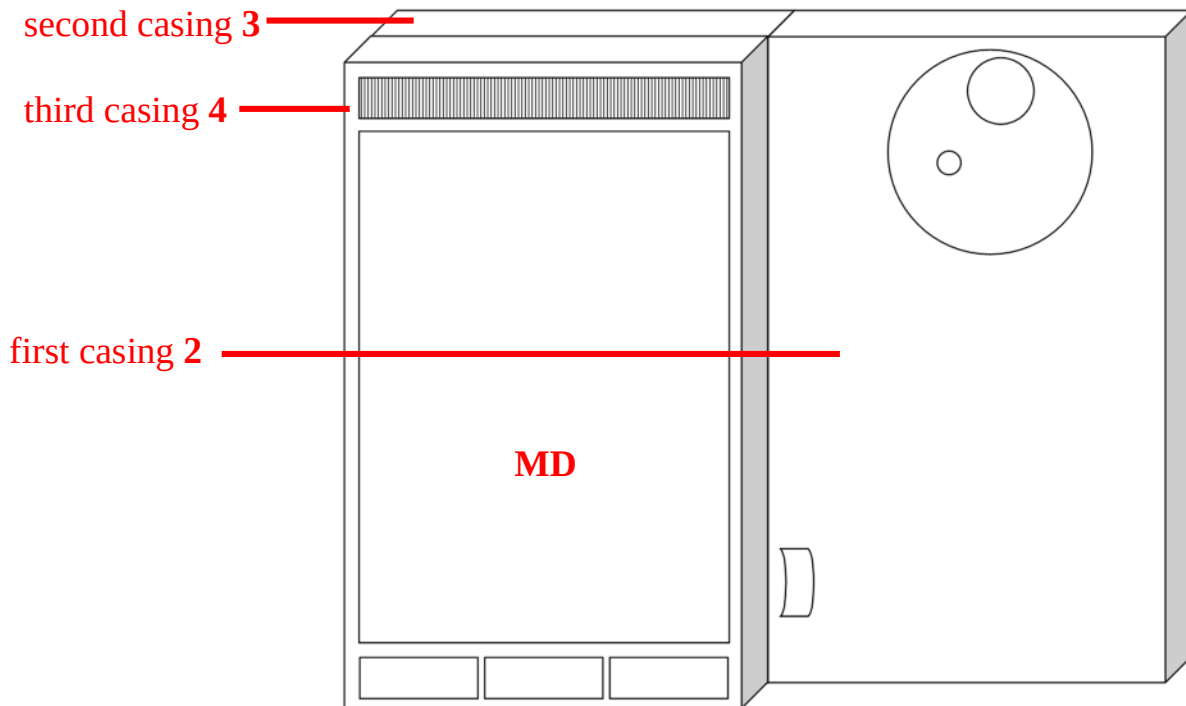
images illustrate a self-portrait shooting configuration in the “first partially opened state” as described in Aono:

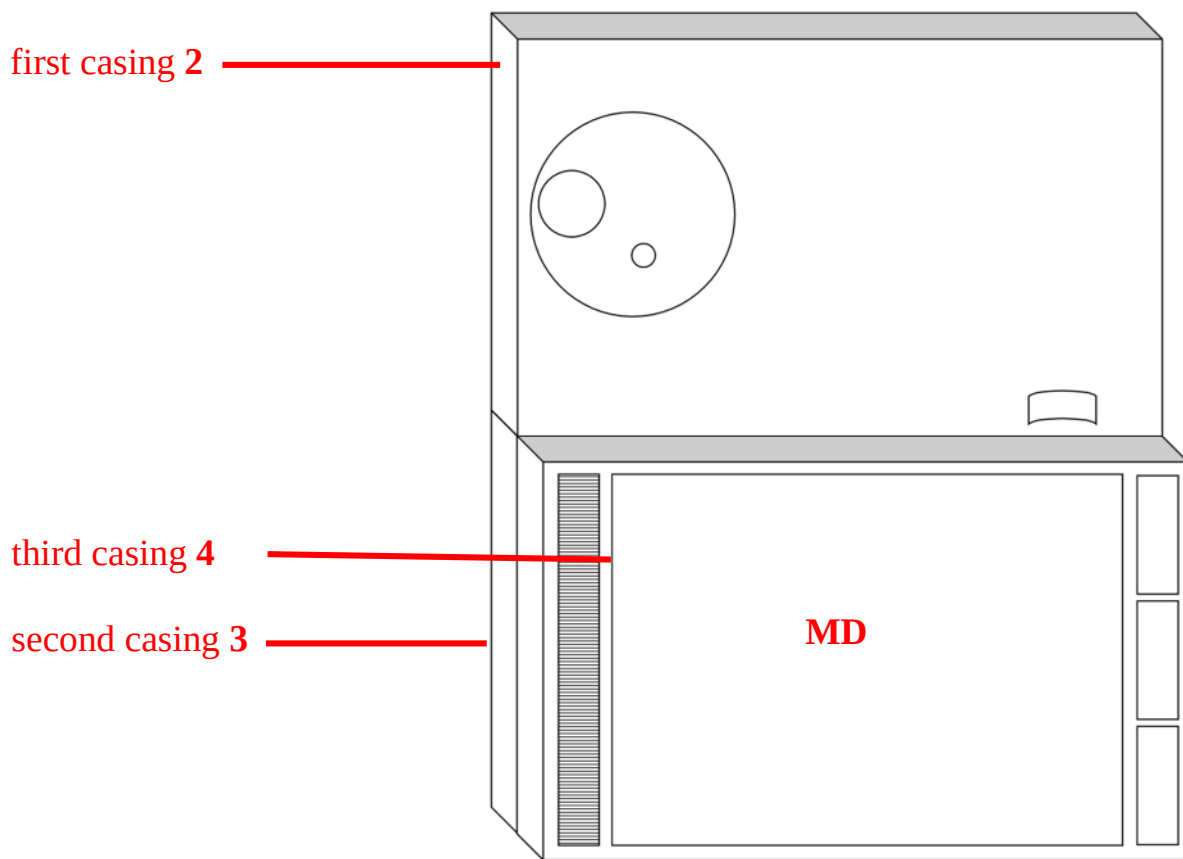




Aono's image capture function also would be configured to capture an inward-facing image in the "second partially opened state." In this state, "the second casing **3** and the third casing **4** are overlaid, and on the other hand, only the first casing **2** is opened." Ex. 1004, [0234]. "At the time of the second partially opened state, a preview image may be displayed ... on the main display panel MD...." *Id.* An image can be captured in any of these configurations. *Id.*, [0235], [0410]. The connecting portions 5U and 5D connecting the casings **2** and **3** have an angular range from 0 to 180 degrees, such that at 180 degrees, "both display panel surfaces of the first casing **2** and second casing **3** are generally lined up sideways." *Id.*, [0099].

Accordingly, in the “second partially opened state” with the angle between casings 2 and 3 set to 180 degrees, the camera shooting lens 7 and the main display **MD** are facing the same direction, such that the user can shoot a self-portrait. Ex. 1003, ¶ 130. The following images illustrate a self-portrait shooting configuration in the “second partially opened state” as described in Aono. Note that in this configuration, the displays SD1 and SD2 are facing outward:



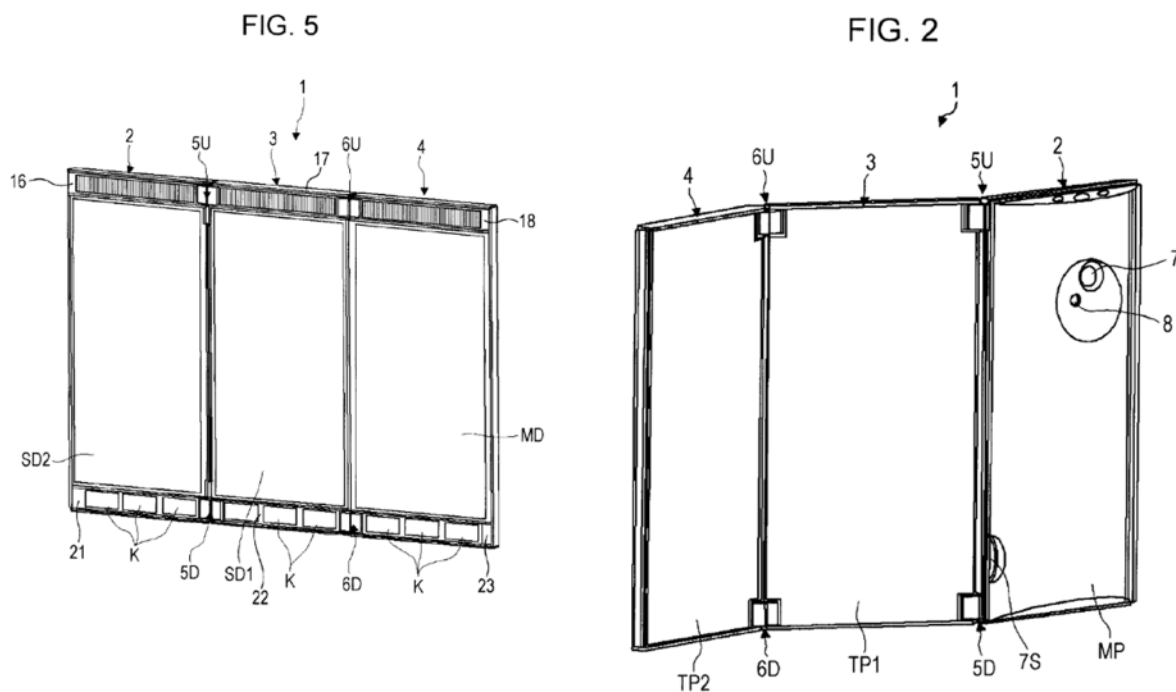


3. Claim 3

[3] The method of claim 2, wherein the device is in an open state.

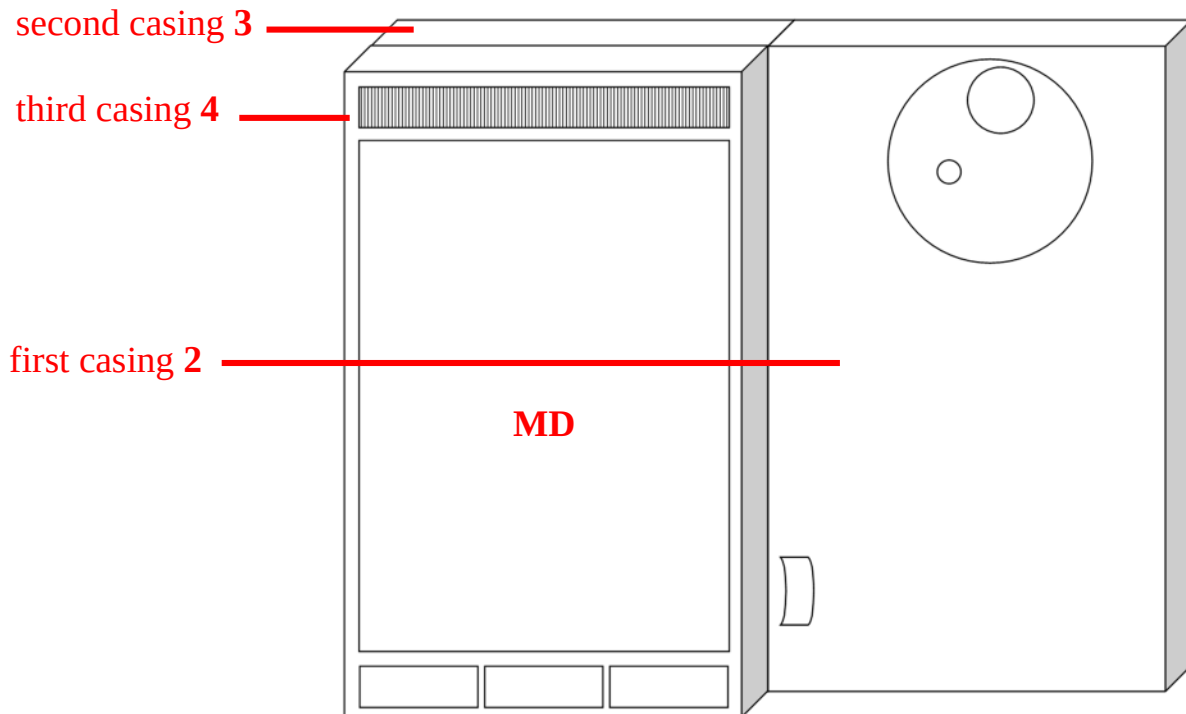
Aono discloses, or at least suggests and otherwise would have rendered obvious to a POSITA, the additional limitations of claim 3. Ex. 1003, ¶¶ 132-135. As discussed above in relation to limitation [1D], the personal digital assistant **1** disclosed by Aono can be configured to be in an “open” physical device state. *Supra* Section VIII.A.1. Aono illustrates the personal digital assistant **1** in an “open state”

in Figures 2 and 5, which also show the camera that could capture the inward-facing image required by Claim 2:



Ex. 1004, Figs. 2, 5. Aono further teaches the device can be configured in a “second partially opened state” as described in connection with Claim 2, which is also an “open state.” *Supra* Section VIII.A.2.

The following images illustrate a self-portrait shooting configuration in the “second partially opened state” as described in Aono:



The “second partially opened state” as described in Aono and illustrated above is in an “open” state because the second casing 3 (containing **SD1**) and the first casing 2 (containing **SD2**) are in the same plane (and visible to the user), consistent with the ’589 patent’s description of “open state.” 13:60-61 (“State 320 is the *open state* where the primary screen 104 and the secondary screen 108 are generally on the same plane.”).

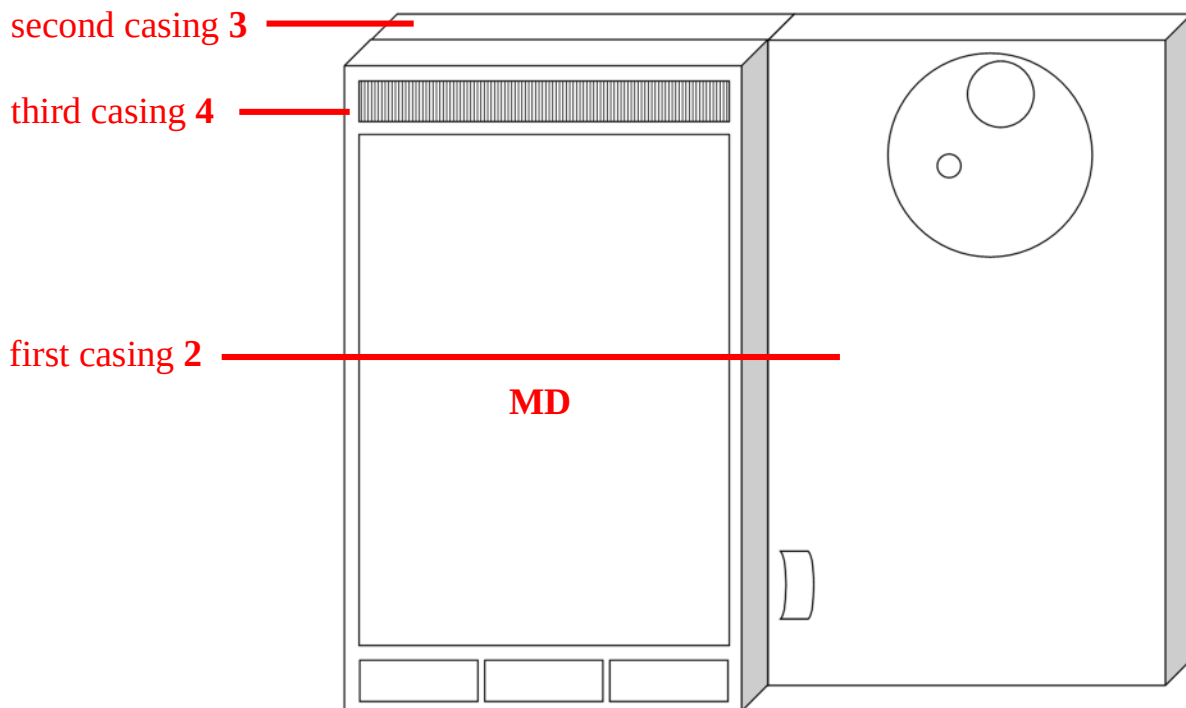
4. Claim 4

[4] The method of claim 3, wherein the first display is a portrait display.

Aono discloses, or at least suggests, the additional limitations of claim 4 and thus at least would have rendered obvious to a POSITA claim 4. Ex. 1003, ¶¶ 136-

139. As discussed above with respect to limitation [1C] (*supra* Section VIII.A.1), the Aono device can transition between “horizontal/vertical state[s],” (Ex. 1004, [0154]), has various “sensors” (*Id.*, [0143]) configured to determine the orientation of the device, and changes the display of images depending upon, among other things, the orientation of the device (and, in turn, its display panels) horizontally or vertically (i.e., in landscape or portrait mode) (*See, e.g., Id.*, [0153-0154], *see also* [0184] and [0222]). Aono also shows various examples of the device in different physical configurations displaying images in both portrait and landscape displays. *Id.*, Figures 26-43; Ex. 1003, ¶ 138.

A POSITA would understand from Aono’s disclosures, or at least it would have been obvious to a POSITA, that the Aono device can display an image in a portrait display (or a landscape display) in any of the Aono device configurations, including the “second partially opened state.” Ex. 1003, ¶ 139. For example, in the “second partially opened state” as described in connection with Claim 2, *supra* Section VIII.A.2, and illustrated below, the first display (which could be the image displayed on any of **MD**, **SD1**, or **SD2**) can be in a portrait orientation:



second partially opened state

The a “second partially opened state” as described and illustrated disclose a first display as a portrait display because the screens are oriented such that the height of the display is greater than its width. See Ex. 1001, 3:52-57 (describing “portrait” orientation).

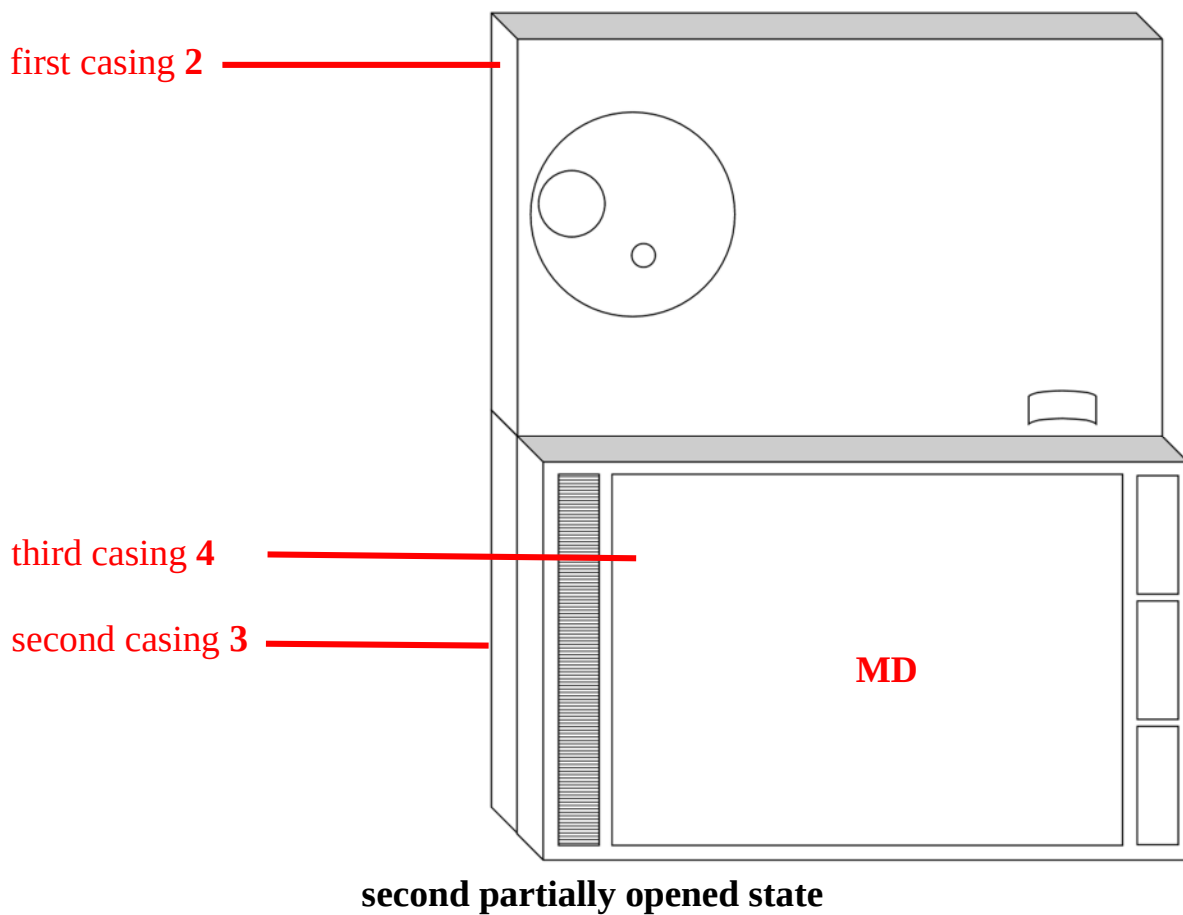
5. Claim 5

[5] The method of claim 4, wherein the second display is a landscape display.

Aono discloses the additional limitations of claim 5 and thus at least would have rendered claim 5 obvious to a POSITA. Ex. 1003, ¶¶ 140-143. As discussed above with respect to limitation [1C] (*supra* Section VIII.A.1), the Aono device can

transition between “horizontal/vertical state[s],” (Ex. 1004, [0154]), has various “sensors” (*Id.*, [0143]) configured to determine the orientation of the device, and changes the display of images depending upon, among other things, the orientation of the device (and, in turn, its display panels) horizontally or vertically (i.e., in landscape or portrait mode) (*See, e.g., Id.*, [0153-0154], *see also* [0184] and [0222]). Aono also shows various examples of the device in different physical configurations displaying images in both portrait and landscape displays. *Id.*, Figures 26-43; Ex. 1003, ¶ 141.

A POSITA would understand from Aono’s disclosures, or at least it would have been obvious to a POSITA, that the Aono device can display an image in a portrait display (or a landscape display) in any of the Aono device configurations, including the “second partially opened state.” Ex. 1003, ¶ 142. For example, in the “second partially opened state” as described in connection with Claim 2, *supra* Section VIII.A.2, and illustrated below, the first display (which could be the image displayed on any of MD, SD1, or SD2) can be in a landscape orientation after the device is rotated 90 degrees from the orientation shown with respect to claim 4:



The a “second partially opened state” as described and illustrated discloses a second display as a landscape display because the screens are oriented such that the width of the display is greater than its height. *See* Ex. 1001, 3:45-52 (describing “landscape” orientation).

6. Claim 6

[6] The method of claim 5, wherein the portion that changes includes an image preview changing from a portrait orientation to a landscape orientation.

Aono discloses the additional limitations of claim 5 and thus anticipates claim 5. Ex. 1003, ¶¶ 144-147. As discussed in relation to Claim 1, limitations [1C], [1E], and [1F], Aono teaches transitioning from displaying an image in a portrait orientation across one screen in a closed device state to displaying an image in a landscape orientation across three screens in an open device state. Section VIII.A.1 *supra*; see also Ex. 1004, [0153]-[0154] (“It goes without saying that an example is also the same as with the above wherein in the terminal closed state, a portrait video corresponding to an aspect ratio of 9:16 is displayed with the long direction of the main display panel MD as perpendicular, and in the terminal opened state, a portrait enlarged video corresponding to an aspect ratio of generally 9:16 is displayed by arraying the three screens in the vertically longitudinal direction as viewed from the user.”).

Moreover, Aono discloses that in the “camera shooting mode,” as described with respect to the “ninth operation control” and Figures 60 and 61, the device will display preview images (preview video data). *Id.*, [0281], [0385]-[0415]. Accordingly, the portion of the display that changes will include an “image preview.” Ex. 1003, ¶ 146.

7. Claim 11

[11P] A device, comprising:

If the preamble is limiting, Aono discloses this limitation. Aono discloses a “device,” specifically “a personal digital assistant having multiple screens, and a display control method and display control program of the personal digital assistant.” Ex. 1004, [0003].

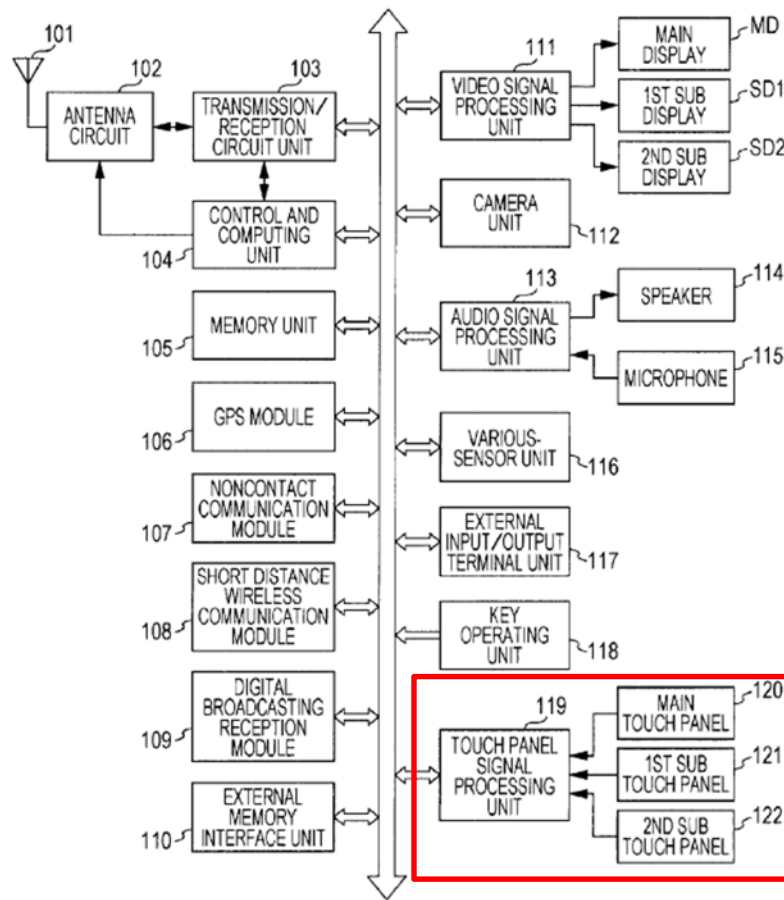
[11A] a first screen, the first screen including a first gesture capture region;

Aono discloses this limitation. Ex. 1003, ¶¶ 149-153; *see supra* Section VIII.A.1 (limitation [1A]).

For example, Aono discloses configuring a device with display panel **SD1** as the first screen. Ex. 1004, [0285]. A “transparent touch sensor panel” is disposed on the entire surface of **SD1**. *Id.* A “touch panel signal processing unit **119** measures the touch detection position, touch path, touch time interval, and so forth from the touch panels **121** and **122**, and transmits the measured data thereof to the control and computing unit 104 as touch detection data.” *Id.*

Aono further discloses configuring the device to make calculations and/or execute control programs or applications in response to data processed by the touch panel signal processing unit **119**. *Id.*, [0287]. Aono illustrates this in Figure 50:

FIG. 50



Ex. 1004, Fig. 50, [0285]-[0287].

Thus, the display panel **SD1** of Aono is a screen including at least a portion that is a “gesture capture region.” Ex. 1003, ¶¶ 152-153. Aono’s disclosure is consistent with the ’589 patent’s description. The ’589 patent explains that a “gesture” is “a user action that expresses an intended idea, action, meaning, result, and/or outcome.” Ex. 1001, 3:63-64. Further, the “touch sensitive screens” comprise “liquid crystal display devices ... capable of providing visual output to a user, and a

capacitive input matrix over those ***regions of the touch sensitive screens*** ... that are ***capable of receiving input from the user.***” *Id.*, 10:67-11:7; *see also* 3:7-10 (“the screen can enable the user to interact with the device by touching areas ... and provides information to a user through a display”). As an example, “the personal digital assistant **1** according to the present embodiment is capable of taking an image ... and shooting an image may be accomplished ... at the time of touching to the touch sensor panel....” *Id.*, [0235]. Thus, touch sensor panel devices comprise regions capable of receiving input from the user, that is, gesture capture regions. Ex. 1003, ¶¶ 152-153.

[11B] a second screen, wherein the second screen faces in a substantially same direction as the first screen when the device is open, and wherein a lens is associated with the second screen;

Aono discloses this limitation. Ex. 1003, ¶¶ 154-158.; *see supra* Section VIII.A.1 (limitation [1A]).

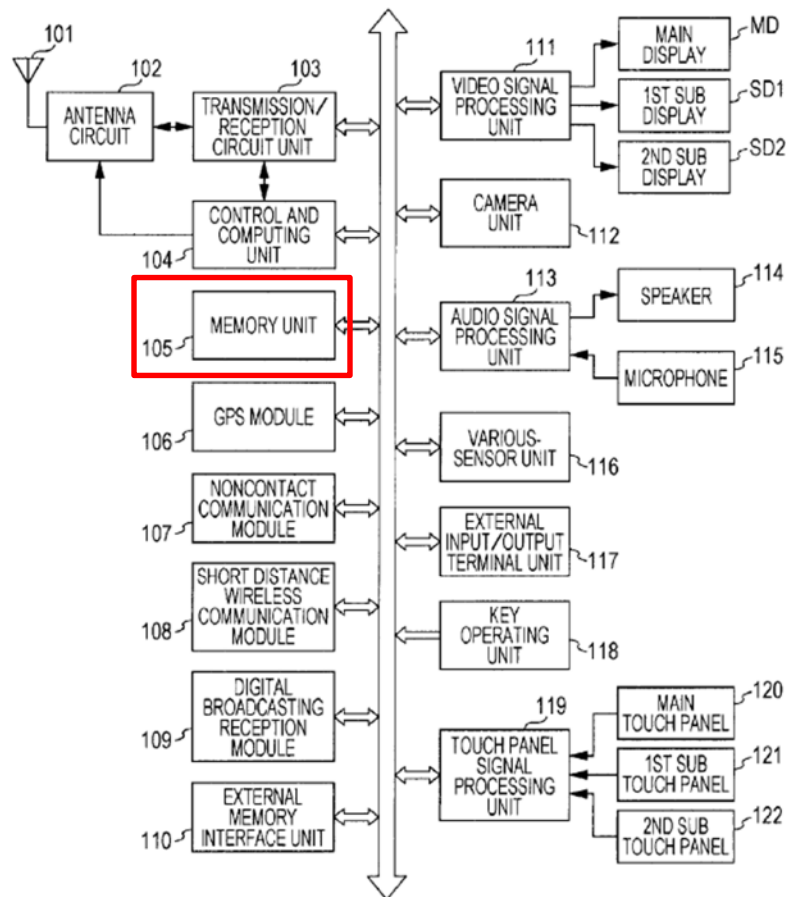
For example, Figure 5 (shown below) illustrates an example of the device in an “open” physical device state. Each of the screens are facing “in a substantially same direction.” Ex. 1003, ¶¶ 155-157.

As another example, two of the screens (SD1 and SD2) can face in the same direction in the “second partially ***opened*** state” of the Aono device. As discussed above with respect to claims 1 and 2, in these states the angle between two of the casings can be set to 180 degrees. *Supra* Sections VIII.A.1 and 2. Configured this

[11C] a memory;

Aono discloses this limitation. Ex. 1003, ¶ 159. Aono's device includes a "memory unit **105** [that] is configured of built-in memory provided to the inner portion of this terminal, and detachable card-shaped memory which stores so-called SIM (Subscriber Identity Module) information and so forth. The built-in memory 105 is made up of ROM (Read Only Memory) and RAM (Random Access Memory). The ROM stores an OS (Operating System), the control program for the control and computing unit **104** controlling each unit, various types of initialization values, dictionary data, various types of audio data, the various types of application programs including the display control program according to the present embodiment, and so forth. This ROM includes rewritable ROM such as NAND-type flash memory or EEPROM (Electrically Erasable Programmable Read-Only Memory), and can store e-mail data, the data of a phone book or mail address book, the data of a still image or moving image content, or otherwise, various types of user setting values, and so forth. The RAM stores successively stores data serving as a work area and a buffer area at the time of the control and computing unit **104** performing various types of data processing." Ex. 1004, [0286], Figure 50:

FIG. 50



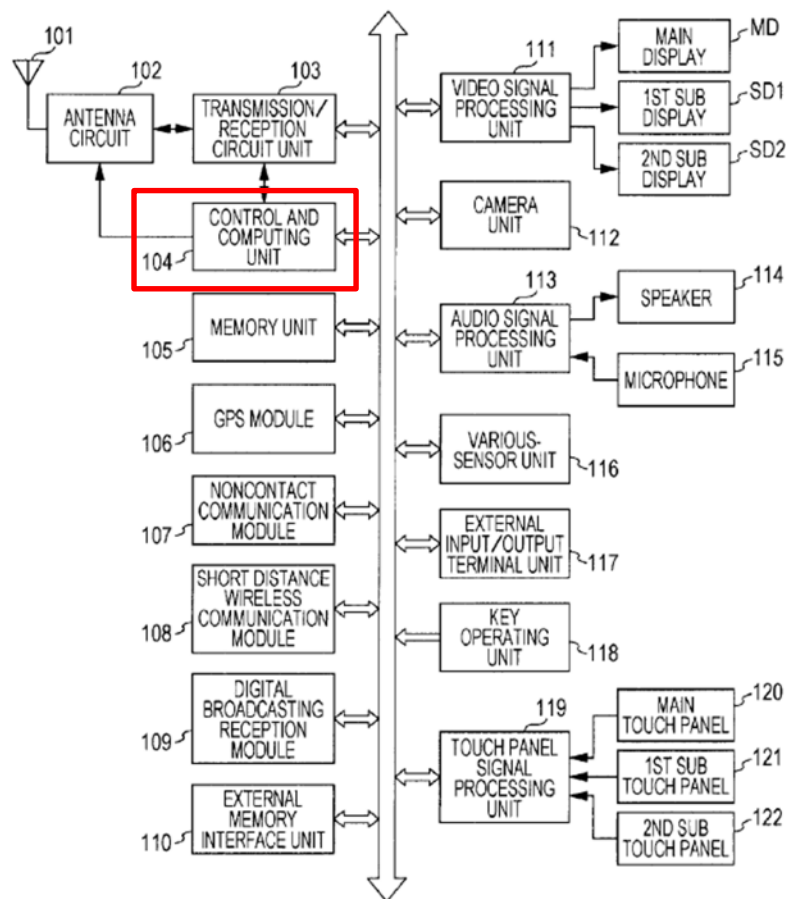
A POSITA would have understood a “memory unit” to be a “memory.” Ex. 1003, ¶ 159.

[11D] a processor in communication with the memory, the first screen, and the second screen, the processor operable to:

Aono discloses this limitation. Ex. 1003, ¶¶ 160-164. Aono’s device includes a “control and computing unit **104** [] made up of a CPU (Central Processing Unit), [which] controls each unit such as the transmission/reception circuit unit **103**, video signal processing unit **111**, audio signal processing unit **113**, GPS module **106**,

noncontact communication module **107**, short-distance wireless communication module **108**, digital broadcasting reception module **109**, external memory interface unit **110**, camera unit **112**, various-sensor unit **116**, external input/output terminal unit **117**, key operating unit **118**, touch panel signal processing unit **119**, and so forth, and also performs various types of computation as appropriate. Also, the control and computing unit **104** executes the control program or various types of application programs stored in the memory unit **105**.” Ex. 1004, [0287], Fig. 50

FIG. 50



A POSITA would have understood that the “CPU (Central Processing Unit)” in “control and computing unit **104**” is a “processor” because it executes programs. Ex. 1003, ¶ 162. Because the “control and computing unit **104**” “executes the control program or various types of application programs stored in the memory unit **105**,” it of course is in communication with the “memory.” *Id.* The “control and computing unit **104**” also is in communication with the first and second screens, as it “controls” both the “video signal processing unit **111**” and the “touch panel signal processing

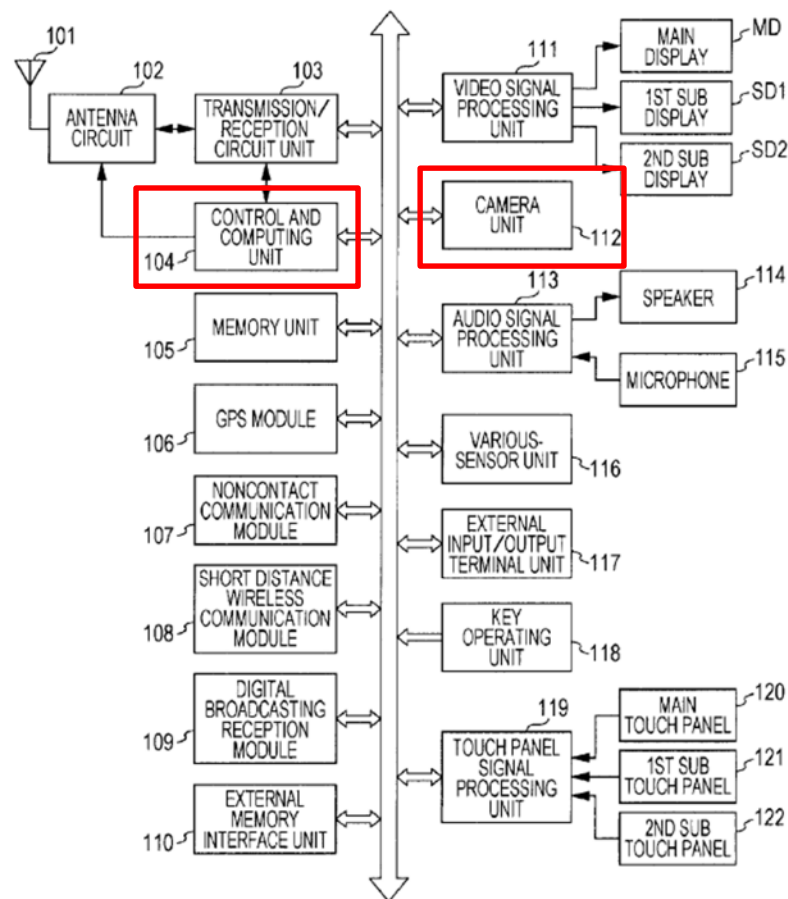
unit **119**,” both of which transmit and receive data from the three screens **MD**, **SD1**, and **SD2**. *Id.*; Ex. 1004, [0281], [0285]. For instance, “a video signal for displaying a video on the above three screens” “may be generated at the control and computing unit **104**.” *Id.*, [0275].

Additionally, Aono specifies that the control and computing unit **104** controls all the steps of “ninth operation control” for the camera shooting mode. Ex. 1004, [0385]-[0415]. As such, a POSITA would have understood that the processor is operable to execute the functions set forth in the following limitations. Ex. 1003, ¶ 163.

[11E] receive user interface input to execute a image capture function;

Aono discloses this limitation for the same reasons discussed above with respect to the limitation in Claim 1, limitation [1B]. *Supra* Section VIII.A.1; Ex. 1003, ¶¶ 165-166. Aono further discloses that the “processor” (part of “control and computing unit **104**”) is operable to control the camera unit **112** as illustrated in Figure 50:

FIG. 50



Ex. 1004, Fig. 50, [0287], [0385]-[0415]; Ex. 1003, ¶ 166.

[11F] determine an image capture function configuration, a device orientation, and a physical device state,

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to Claim 1, limitation [1C] (determining device orientation and physical device state) and Claim 2 (determining an image capture function configuration, *e.g.*, if the device is

configured to be used to capture self-portraits or not). *Supra* Sections VIII.A.1, 2; Ex. 1003, ¶¶ 167-174.

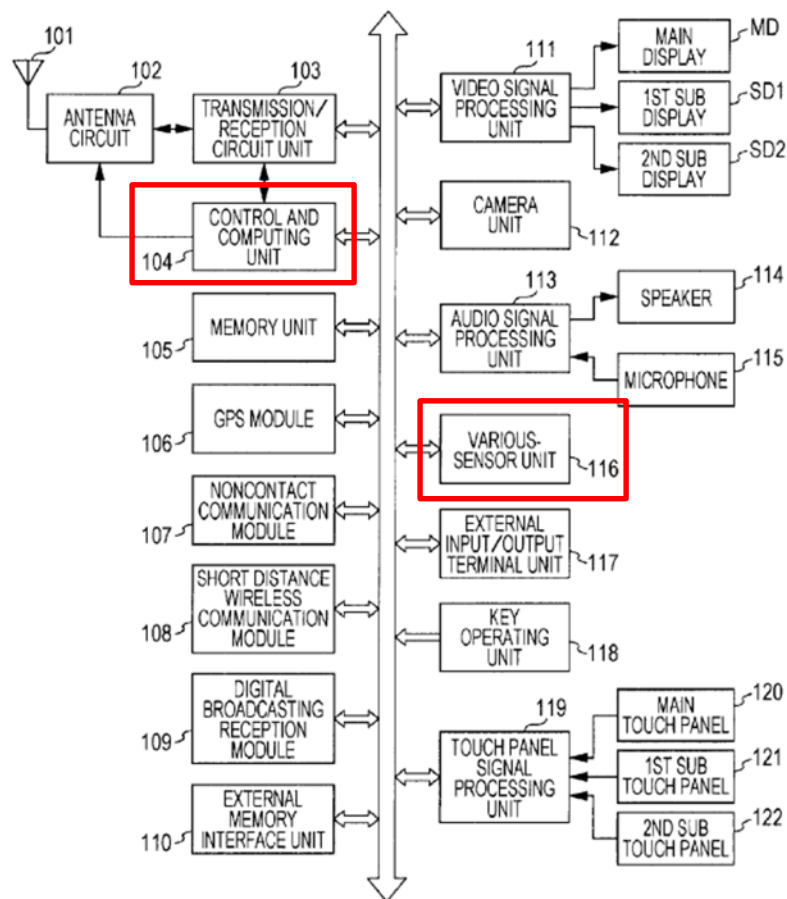
Regarding the “image capture function configuration,” Aono discloses that the image capture function configuration could be a self-portrait configuration or other configurations. Ex. 1003, ¶ 168. As noted with respect to claim 2, Aono discloses a self-portrait configuration. Ex. 1004, [0233]. The device also can enter an image capture function configuration to take an outward-facing image. The shooting angle in the “first partially opened configuration” can be set to not just 180 degrees (allowing the user to shoot a self-portrait) but also to different angles such as 0 degrees or 90 degrees. *Id.* These allow a user to take an outward-facing image. Ex. 1003, ¶ 169. Indeed, “the user can perform shooting by various shooting angles as [*sic*, at] ease.” Ex. 1004, [0233]. The device also could have a configuration to take an outward-facing image in other device states. In the “terminal closed” state, for example, as shown in Figure 3, the only visible display (**MD**) and the lens 7 face in opposite directions, so the device is configured to take an outward-facing image. *Id.*, Fig. 3, [0389]-[0390]; Ex. 1003, ¶ 170. In the “terminal fully opened” state, the three displays **MD**, **SD1**, and **SD2** likewise all face in an opposite direction from the lens 7, so the device is configured to take an outward-facing image. Ex. 1004, Fig. 5, [0395]-[0396]; Ex. 1003, ¶ 171. And in the “second partially opened”

configuration, the device can take an outward-facing image, with the user looking through **SD1** or **SD2**. Ex. 1003, ¶ 172.

To the extent that the determination of the image capture function configuration in Aono is deemed to be based on the physical device state, this is consistent with the teachings of the '589 patent itself: “The device 100 can determine an image capture function 1100 configuration based on the devices state and display mode, in step 1312.” Ex. 1001, 33:16-18; Ex. 1003, ¶ 173.

Aono further discloses that the “processor” (part of “control and computing unit **104**”) is operable to interact with the camera unit **112** (as discussed immediately above) and the various-sensor unit **116**. The various-sensor unit **116** “is configured of various detection sensors such as the above terminal state detection sensor and so forth for detecting the state of the personal digital assistant 1” and “[d]etection signals from the various-sensor unit 116 are sent to the control and computing unit 104.” Ex. 1004, [0284], [0287], Fig. 50:

FIG. 50



[11G] wherein the image capture function configuration is for a self-portrait, the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max¹⁰

Aono discloses, or at least suggests, this limitation for the same reasons discussed above with respect to the limitation in Claim 1, limitations [1C], [1D], and Claim 2. *Supra* Sections VIII.A.1, 2; Ex. 1003, ¶ 175.

Aono further discloses that the “processor” is the CPU (Central Processing Unit)” (part of “control and computing unit **104**”) as described in Claim [11D] *supra*; see Ex. 1004, [0287], Fig. 50; see also Ex. 1003, ¶ 176.

[11H] based on the image capture function configuration, the device orientation, and the device state, enter a dual screen mode for the image capture function;

Aono discloses, or at least suggests, this limitation for the same reasons discussed above with respect to the limitation in claim 1, limitation [1F]. *Supra* Section VIII.A.1; Ex. 1003, ¶ 177.

As explained above with respect to Claim 2, the Aono device is configured to take a “self-portrait” when in the “second partially opened state.” *Supra* Section VIII.A.2; Ex. 1004, [0234], [0235], [0410]; Ex. 1003, ¶ 178. And, as explained

¹⁰ The term “display mode” has no antecedents. For purposes of this Petition, Petitioners interpret “display mode” the same as the term is used in claim 1.

above with respect to Claim 1, limitation [1D], Aono's device is capable of a "dual screen mode" when in the "second partially opened state," as the device "displays a preview image on ***one or more display panel[s]*** ... which the user desires." *Supra* VIII.A.1; Ex. 1004, [0234], [0410]; Ex. 1003, ¶ 178.

Aono further discloses that the "processor" is the "CPU (Central Processing Unit)" (part of "control and computing unit **104**") as described in Claim [11D] *supra*; see Ex. 1004, [0287], Fig. 50; see also Ex. 1003, ¶ 179.

[11I] present a first display for the image capture function;

Aono this limitation for the same reasons discussed above with respect to the limitation in Claim 1, limitation [1C]. *Supra* Section VIII.A.1; Ex. 1003, ¶ 180.

Aono further discloses that the "processor" is the "CPU (Central Processing Unit)" (part of "control and computing unit **104**") as described in Claim [11D] *supra*; see Ex. 1004, [0287], Fig. 50; see also Ex. 1003, ¶ 181.

[11J] receive a device orientation change, wherein the device orientation change is a rotation of the device; and

Aono discloses this limitation for the same reasons discussed above with respect to the limitation in Claim 1, limitation [1E]. *Supra* Section VIII.A.1; Ex. 1003, ¶ 182.

Aono further discloses that the “processor” is the “CPU (Central Processing Unit)” (part of “control and computing unit **104**”) as described in Claim [11D] *supra*; *see* Ex. 1004, [0287], Fig. 50; *see also* Ex. 1003, ¶ 183.

[11K]based on the device orientation change, the image capture function configuration and the device state, present a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.

Aono discloses this limitation for the same reasons discussed above with respect to the limitation in Claim 1, limitation [1F]. *Supra* Section VIII.A.1; Ex. 1003, ¶ 184.

Aono further discloses that the “processor” is the “CPU (Central Processing Unit)” (part of “control and computing unit **104**”) as described in Claim [11D] *supra*; *see* Ex. 1004, [0287], Fig. 50; *see also* Ex. 1003, ¶ 185.

8. Claim 12

Aono discloses, or at least suggests, the additional limitations of claim 12 and thus at least would have rendered obvious to a POSITA Claim 12. Ex. 1003, ¶¶ 186-194.

[12A] The device of claim 11, wherein the device is in an open state,

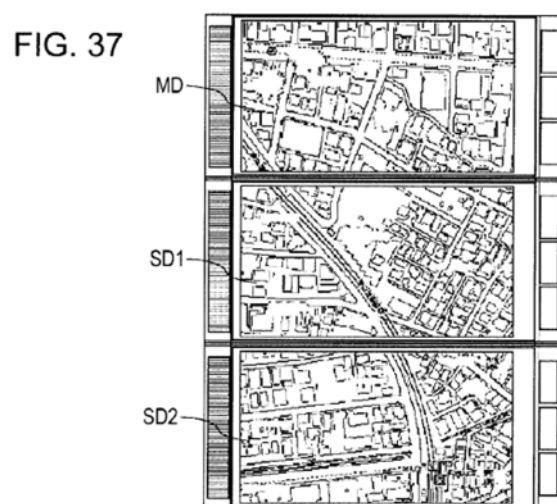
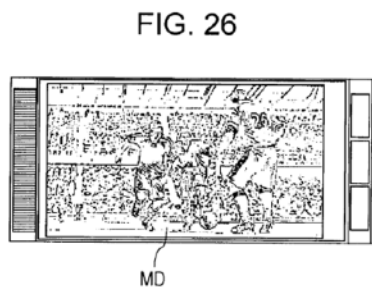
Aono discloses, or at least suggests, this limitation. Ex. 1003, ¶¶ 187-189. The elements of limitation [12A] include those of Claim 3 (*i.e.*, device is in an open state). Aono discloses, or at least suggests and would have rendered obvious the

limitations of Claim 3 and thus also discloses, or at least suggest and would have rendered obvious limitation [12A] . *Supra* Sections VIII.A.3; Ex. 1003, ¶ 188.

Furthermore, as discussed above with respect to claims 2 and 11, the Aono device can be configured to take a self-portrait in a “second partially ***opened***” state with two of the screens in the same plane. For example, in the “second partially opened” state, with the angle between casings 2 and 3 set to 180 degrees, screens SD1 and SD2 are in the same plane and thus the device is “open” in the same way as described in the ’589 patent. *Supra* Sections VIII.A.2, VIII.A.7; Ex. 1003, ¶ 189.

[12B] wherein the first display is in a landscape orientation, and

Aono discloses this limitation. Ex. 1003, ¶¶ 190-192. Aono discloses the first display of the device in a landscape orientation, which Aono illustrates in, e.g., Figures 26 and 37:



Ex. 1004, Figs. 26, 37; Ex. 1003, ¶ 191. A POSITA would have understood that the device and displays of Aono can be in landscape or portrait orientation in any of the device states and configurations, including the “first partially opened state” and “second partially opened state.” Ex. 1003, ¶ 192; *see supra* Section VIII.A.1, limitation [1C].

[12C] wherein the image capture mode is a self-portrait mode.

Aono discloses, or at least suggests, this limitation. Ex. 1003, ¶¶ 193-194. The elements of limitation [12C] include those of Claim 2 (*i.e.*, device is in a self-portrait mode). Aono discloses the limitations of Claim 2 because Aono teaches configuring a device to capture inward-facing images, and thus also discloses limitation [12A]. *Supra* Sections VIII.A.2; Ex. 1003, ¶ 194.

9. Claim 13

[13] The device of claim 11, wherein the second display is in a portrait orientation.

Aono discloses, or at least suggests, the additional limitations of Claim 13 and thus at least would have rendered obvious to a POSITA Claim 13. Ex. 1003, ¶¶ 195-196. A POSITA would have understood that the device and displays of Aono can be in landscape or portrait orientation in any of the device states and configurations, including the “second partially opened state.” Ex. 1003, ¶ 196; *see supra* Section VIII.A.1, limitation [1C], and Section VII.A.4, Claim 4.

10. Claim 14

[14] The device of claim 13, wherein the portion that changes includes an image preview changing from a landscape orientation to a portrait orientation.

Aono discloses, or at least suggests, the additional limitations of Claim 14 and thus would have rendered Claim 14 obvious to a POSITA. Ex. 1003, ¶¶ 197-200. Aono teaches transitioning from displaying an image preview in a landscape to displaying an image preview in a portrait orientation on screens in an open device state, as discussed in detail above with respect to Claim 1, limitations [1C], [1E], and [1F]. *Supra* Sections VIII.A.1; *see also* Ex. 1004, [0153]-[0154] (describing an example where “a landscape video corresponding to an aspect ratio of 16:9 is displayed with the long direction of the main display panel MD as level, and in the terminal opened state, a landscape enlarged video corresponding to an aspect ratio of generally 16:9 is displayed by arraying the three screens in the horizontally lateral direction as viewed from the user.”); Figures 26 and 27:

FIG. 26

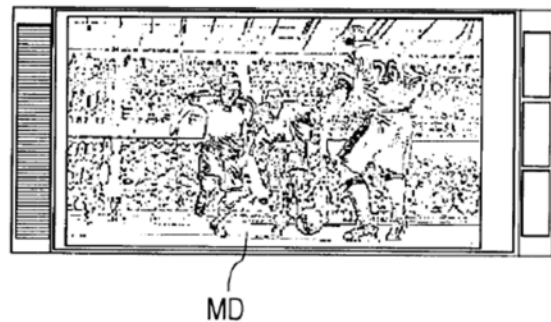
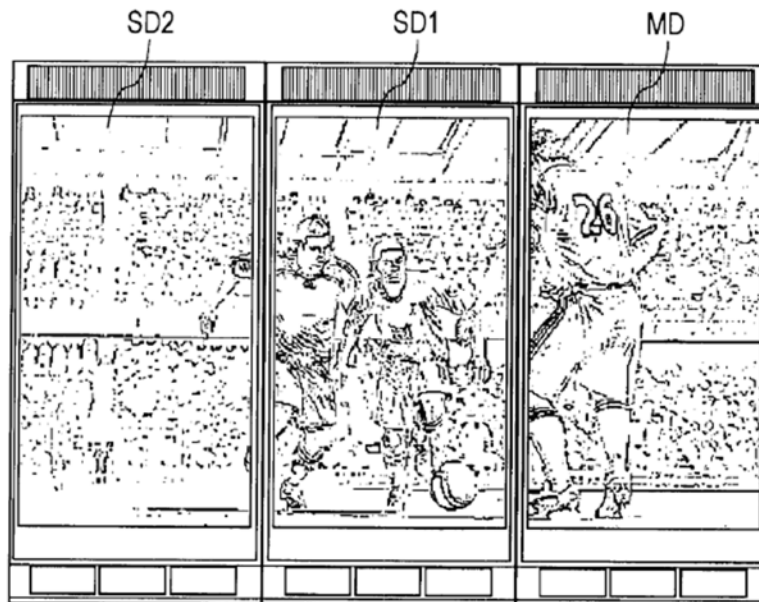


FIG. 27



Id., Figs. 26-27, [0152]-[0154]. Although the Figures above show the device in a “terminal closed” and “terminal open” state, POSITA would have understood that the device and displays of Aono can be in landscape or portrait orientation in any of the device states and configurations, including the “second partially opened state,”

and that the image preview would change from a portrait to a landscape orientation in any of these states upon, e.g., a rotation of the device. Ex. 1003, ¶ 198; *see supra* Section VIII.A.1, limitations [1C], [1E], [1F]. And, as also previously discussed with respect to limitations [1C], [1E], [1F], the portion of the display that changes will include an image preview when in the “ninth operation control” mode for the camera operation. *See also* Ex. 1004, [0281], [0385]-[0415].

11. Claim 16

[16P] A non-transitory computer readable medium having stored thereon computer-executable instructions, the computer executable instructions causing a processor of a device to execute a method for providing a user interface, the computer-executable instructions comprising:

If the preamble is limiting, Aono discloses this limitation.

As explained above with respect to claim 11, limitation [11C], Aono discloses a “memory unit **105**.” *Supra* Section VIII.A.7. This “memory unit” is a computer readable medium. Ex. 1003, ¶ 203. The “memory unit” stores “computer-executable instructions.” *Id.*, ¶¶ 204-205. “The ROM stores an OS (Operating System), the control program for the control and computing unit **104** controlling each unit ... the various types of application programs including the display control program according to the present embodiment, and so forth.” Ex. 1004, [0286].

The computer-executable instructions cause a processor of the device to execute a method for providing a user interface. Ex. 1003, ¶ 205. As explained with

respect to claim 11, limitation [11D], the “CPU (Central Processing Unit)” (part of “control and computing unit **104**”) is the “processor.” *Supra* Section VIII.A.7. “[T]he control and computing unit **104** executes the control program or various types of application programs stored in the memory unit **105**.” Ex. 1004, [0287].

The “computer executable instructions” comprise the instructions listed in the steps that follow. Ex. 1003, ¶ 206. As noted above with respect to limitation [11D], the “control program” and “application programs” are executed by the control and computing unit to control the operations of Aono’s device. Aono also specifies that the control and computing unit **104** controls and executes the steps of all the steps of “ninth operation control” for the camera shooting mode. Ex. 1004, [0385]-[0415]. As such, a POSITA would have understood that the processor is operable to execute the functions set forth in the following limitations. Ex. 1003, ¶¶ 204-207.

[16A] instructions to receive user interface input to execute a image capture function;

Aono discloses this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1B] and Claim 11, limitation [11F]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 208.

[16B] instructions to determine an image capture function configuration, a device orientation, and a physical device state,

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to Claim

1, limitation [1C], Claim 2, and Claim 11, limitation [11F]. *Supra* Section VIII.A.1, VIII.A.2, VIII.A.7; Ex. 1003, ¶ 209.

[16C] wherein the device has at least first and second screens,

Aono discloses this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1A] and Claim 11, limitations [11B] and [11C]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 210.

[16D] wherein the device is in an open state,

Aono discloses this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1D], Claim 2, Claim 3, and Claim 11, limitation [11B]. *Supra* Section VIII.A.1, VIII.A.2, VIII.A.3, VIII.A.7; Ex. 1003, ¶ 211.

[16E] wherein, in the open state, the first and second screens face in substantially same directions,

Aono discloses this limitation for the same reasons discussed above with respect to the limitations in Claim 11, limitation [11B]. *Supra* Section VIII.A.7; Ex. 1003, ¶ 212.

[16F] wherein the image capture function is configured to capture an inward-facing image,

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to the limitations in Claim 2 and Claim 11, limitations [11F] and [11G], that is, the image

capture function is configured to capture a “self-portrait,” or inward-facing, image.

Supra Section VIII.A.2, VIII.A.7; Ex. 1003, ¶ 213.

[16G] and wherein a lens is associated with the second screen;

Aono discloses this limitation for the same reasons discussed above with respect to the limitation in Claim 11, limitation [11B]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 214.

[16H] based on the image capture function configuration, the device orientation, and the physical device state, instructions to enter a dual screen mode for the image capture function,

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitations [1C] and [1D] and claim 11, limitation [11H]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 215.

[16I] the physical device state at least including open, closed easel or modified easel, the display mode at least including portrait single, portrait dual, landscape single, landscape dual, portrait max or landscape max;

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1D] and claim 11, limitation [11F]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 216.

[16J] instructions to present a first display for the image capture function;

Aono discloses this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1C] and Claim 11, limitation [11I]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 217.

[16K] instructions to receive a device orientation change, wherein the device orientation change is a rotation of the device; and

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1E] and Claim 11, limitation [11J]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 218.

[16L] based on the device orientation change, the image capture function configuration and the device state, instructions to present a second display for the image capture function, wherein a portion on the first and second screen changes from the first display to the second display.

Aono discloses, or at least suggests and would have rendered obvious to a POSITA, this limitation for the same reasons discussed above with respect to the limitations in Claim 1, limitation [1F] and Claim 11, limitation [11K]. *Supra* Section VIII.A.1, VIII.A.7; Ex. 1003, ¶ 219.

B. Secondary Considerations of Non-Obviousness

Petitioner is unaware of any applicable secondary considerations of non-obviousness. None were identified or asserted during prosecution. *See generally* Ex. 1003. Regardless, even if such considerations existed, none would overcome the

strong *prima facie* showing of obviousness. Ex. 1002.

IX. Conclusion

As explained above, Petitioners are likely to prevail in showing that at least one of the Challenged Claims is unpatentable and requests that IPR be instituted and that the Challenged Claims be canceled.

Respectfully submitted,

Dated: October 17, 2024

By /T. Vann Pearce, Jr./

*Counsel for Petitioner Motorola
Designated Lead Counsel for Petitioners*

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW complies with the type volume limitation in 37 C.F.R. § 42.24(a)(1)(i). According to the utilized word-processing system's word count, the petition—excluding the caption, table of contents, table of exhibits, mandatory notices, certificate of word count, and certificate of service—contains 13,839 words.

Dated: October 17, 2024

By /T. Vann Pearce, Jr./

Counsel for Petitioner Motorola

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

CERTIFICATE OF SERVICE

The undersigned hereby confirms that the foregoing PETITION FOR IPR and associated documents and exhibits were caused to be served on October 17, 2024 via overnight courier upon the following counsel of record for Patent Owner:

MULTIFOLD INTERNATIONAL-Patents and Licensing LLC
No. 178, Sec. 3 Minquan East Road
8 Floor
Taipei, 105401 TAIWAN

A courtesy copy was also sent via express mail to the Patent Owner's Power of Attorney of record via overnight courier at the following address as listed on Patent Center:

SHERIDAN ROSS P.C.
1560 Broadway, Suite 1200
Denver, CO 80202

A courtesy copy was also sent via electronic mail to the Patent Owner's litigation counsel at the following addresses:

Timothy K. Gilman
Chris Gerson
Daniel Apgar
Jonathan H. Koppell
SCHULTE ROTH & ZABEL LLP
919 Third Avenue
New York, NY 10022
Tim.Gilman@srz.com
Chris.Gerson@srz.com
Daniel.Apgar@srz.com
Jonathan.Koppell@srz.com

Petition for *Inter Partes* Review of
U.S. Patent No. 9,146,589

Daniel M. Silver
Alexandra M. Joyce
Maliheh Zare
McCARTER & ENGLISH LLP
Renaissance Centre
405 N. King Street, 8th Floor
Wilmington, DE 19801
dsilver@mccarter.com
ajoyce@mccarter.com
mzare@mccarter.com

/ Karen Johnson /

Karen Johnson