

Petition for *Inter Partes* Review of
U.S. Patent No. 8,115,731 B2

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NINTENDO CO., LTD., and
NINTENDO OF AMERICA INC.,
Petitioners

v.

MALIKIE INNOVATIONS LTD.,
Patent Owner

Case IPR2026-00004
U.S. Patent No. 8,115,731 B2
Issue Date: February 14, 2012

Title: METHOD OF OPERATING A HANDHELD DEVICE FOR
DIRECTIONAL INPUT

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OF U.S. PATENT NO. 8,115,731 B2**

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EXHIBIT LIST

Exhibit No.	Description of Document
1001	U.S. Patent No. 8,115,731 B2 to Marcelo Varanda (filed Oct. 3, 2005, issued Feb. 14, 2012) (“731” or “731 patent”)
1002	Declaration of Nathaniel Polish, Ph.D. (“Polish”)
1003	Prosecution history of U.S. Patent No. 8,115,731
1004	U.S. Patent No. 6,937,272 B1 to Christopher R. Dance (filed Nov. 8, 2000, issued Aug. 30, 2005) (“Dance”)
1005	U.S. Patent No. 6,400,471 B1 to David Kuo and Eric Anderson (filed Feb. 11, 1999, issued June 4, 2002) (“Kuo”)
1006	U.S. Patent No. 5,910,797 to Leonardus G. M. Beuk (filed Feb. 13, 1996, issued June 8, 1999) (“Beuk”)
1007	International Publication No. WO 00/17848 to Arthur L. Zwern et al. (filed Sep. 22, 1999, issued Mar. 30, 2000) (“Zwern”)
1008	U.S. Patent No. 5,232,223 to Larry Dornbusch (filed Mar. 24, 1992, issued Aug. 3, 1993) (“Dornbusch”)
1009	English translation of Japanese Patent Publication No. H11-188182 to Takatsugu Uragami (filed Dec. 25, 1997, published July 13, 1999) (“Uragami”)
1010	U.S. Patent No. 6,589,117 B1 to Yasuyuki Moritome et al. (filed Dec. 7, 1998, issued July 8, 2003) (“Moritome”)
1011	U.S. Patent No. 5,955,713 to John S. Titus et al. (filed Oct. 3, 1997, issued Sep. 21, 1999) (“Titus”)
1012	Claim Construction Report by Gavin T. Garner, PhD served in <i>Malikie Innovations Ltd. v. Nintendo Co.</i> , No. 2:24-cv-01490-JLR (W.D. Wash.), dated August 6, 2025 (“8/6/2025 Garner Decl.”)
1013	Declaration of Dr. Nathaniel Polish Regarding Claim Construction of U.S. Patent No. 8,115,731 served in <i>Malikie Innovations Ltd. v. Nintendo Co.</i> , No. 2:24-cv-01490-JLR (W.D. Wash.), dated August 6, 2025 (“8/6/25 Polish Decl.”)

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1014	Report by Gavin T. Garner, PhD in Response to the August 6, 2025 Declaration of Dr. Nathaniel Polish regarding Claim Construction of U.S. Patent No. 8,115,731 served in <i>Malikie Innovations Ltd. v. Nintendo Co.</i> , No. 2:24-cv-01490-JLR (W.D. Wash.), dated September 5, 2025 (“9/5/2025 Garner Decl.”)
1015	Japanese Patent Publication No. H11-188182 to Takatsugu Uragami (filed Dec. 25, 1997, published July 13, 1999)
1016	U.S. Patent No. 6,200,219 B1 to Elliot Rudell et al. (filed Nov. 9, 1998, issued Mar. 13, 2001) (“Rudell”)
1017	Excerpts from <i>Microsoft Press Computer Dictionary</i> (2d ed. 1994) (“Microsoft Computer Dictionary”)
1018	The Black Bass Instruction Manual (1989)
1019	Excerpts from John Potter Shields, <i>Novel Experiments with Electricity</i> (1970)
1020	U.S. Patent No. 5,209,343 to Robert P. Romano and James L. Weaver (filed Jan. 21, 1992, issued May 11, 1993) (“Romano”)
1021	Excerpts from Steven W. Smith, <i>The Scientist and Engineer’s Guide to Digital Signal Processing</i> (1997) (“Smith”)
1022	Excerpts from John Hedgecoe, <i>The Art of Digital Photography</i> (2006)
1023	Excerpts from Mark Edward Soper, <i>Unleashing Microsoft Windows Vista Media Center</i> (2009)
1024	Excerpts from John R. Newport, <i>Avionic Systems Design</i> (1994)
1025	<i>Malikie, et al. v. Nintendo, et al.</i> , No. 2:24-cv-01490-JLR, D.I. 50, LPR 132 Joint Claim Construction and Prehearing Statement (Amended), (W.D. Wash.) (Filed 09/24/2025)

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Exhibit No.	Description of Document
1026	English translation of Japanese Laid-Open Patent Application No. 2000-148694A to Takeshi Nakano (filed November 6, 1998, published May 30, 2000) (“Nakano”)
1027	Japanese Laid-Open Patent Application No. 2000-148694A to Takeshi Nakano (filed November 6, 1998, published May 30, 2000)
1028	<i>Malikie, et al. v. Nintendo, et al.</i> , No. 2:24-cv-01490-JLR, D.I. 15, Stipulated Motion Extending Time for Defendants to Respond to Complaint (W.D. Wash.) (Filed Oct. 21, 2024)
1029	Sport Bass Fishin’ Instruction Manual, Radica (2000)

I. MANDATORY NOTICES UNDER § 42.8(A)(1)

A. Real Parties-In-Interest under § 42.8(b)(1)

Nintendo Co., Ltd. and Nintendo of America Inc. (collectively, “Petitioner”) are the real parties-in-interest to this petition.

B. Related Matters under § 42.8(b)(2)

U.S. Patent No. 8,115,731 is asserted in pending litigation involving Petitioner: *Malikie Innovations Ltd. v. Nintendo Co.*, No. 2:24-cv-01490-JLR (W.D. Wash.). The complaint was served on October 21, 2024. (EX1028.)

C. Lead and Back-Up Counsel under § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

This Petition is being served by Federal Express to the attorneys of record for the '731 patent: Botos Churchill IP Law LLP – Malik, 430 Mountain Avenue, Suite 401, New Providence, NJ 07974. Petitioner consents to electronic service at the addresses above for lead and back-up counsel.

II. FEE PAYMENT UNDER §42.103

Petitioner requests review of 6 claims, with a \$51,875 payment.

III. REQUIREMENTS UNDER §§42.104 AND 42.108

A. Grounds for Standing

Petitioner certifies that the '731 patent is available for IPR and that
Petitioner is not barred or estopped.

B. Identification of Challenge and Statement of Precise Relief Requested

Petitioner requests IPR institution based on:

Ground	Claims	Basis Under §103
Dance-Based		
1	1	Dance
2	1	Ground 1 + Kuo and Beuk
3	11, 13, 14	Ground 1 + Zwern
4	11, 13, 14	Ground 2 + Zwern
5	2-3	Ground 1 + Titus
6	2-3	Ground 2 + Titus
Dornbusch-Based		
7	1-3, 11, 13-14	Dornbusch in view of Uragami
8	1-3, 11, 13-14	Ground 7 + Moritome and Nakano
9	2-3	Ground 7 + Titus
10	2-3	Ground 8 + Titus

This Petition is supported by the Declaration of Nathaniel Polish (EX1002; “Polish”), a qualified expert. (Polish, ¶¶3-11, Appendix A.)

C. Considerations Under §§314(a) and 325(d)

Discretionary denial is not warranted. This is the first and only IPR petition filed by anyone against the ’731 patent, and the validity or patentability of the ’731 patent has not been adjudicated previously. None of the references relied on in Grounds 1-10 were identified during prosecution. The pending litigation against Petitioner is in a relatively early stage. Petitioner intends to promptly move to stay the litigation pending IPR. Additionally, in the event of IPR institution (and the institution is not subsequently vacated, or a Final Written Decision in the IPR is not subsequently vacated or terminated), Petitioner will not pursue in district court any grounds of invalidity against the challenged claims that were or reasonably could have been asserted in IPR under §§ 102 or 103 on the basis of prior art patent or printed publications. Petitioner will further address discretionary denial considerations if Patent Owner seeks discretionary denial of the Petition.

IV. ’731 PATENT

A. POSITA

A POSITA would have possessed a Bachelor’s degree in software engineering, electrical engineering, or a similar degree, with two to three years of practical experience designing systems that use spatial sensors, including to detect

position and orientation. (Polish, ¶¶14-16.) Additional education could have substituted for professional experience, and vice-versa. (*Id.*)

B. Specification

The '731 patent is titled “Method of Operating a Handheld Device for Directional Input.” (EX1001.) The patent purports to “provide[] a directional input device that provides a directional input signal when the orientation of the handheld device is manipulated. For example, if it desired to move the cursor to the right, the handheld would be tilted to the right.” ('731, 5:50-54.)

V. CLAIM CONSTRUCTION

Petitioner has applied the plain and ordinary meaning of the terms of the '731 patent. The parties have proposed constructions of certain terms in the pending litigation, but for purposes of IPR, the Board need not construe those terms as the prior art satisfies those constructions or any other reasonable construction.

Petitioner notes that claim 2[c] recites “circuit closing means,” which appears to be a means-plus-function limitation (§112, ¶6). As explained in Part VII(A)(1)(d), the function is to move in response to inclination of the handheld computing device between a neutral position in which the primary contact and a directional contact form an open circuit, and an active position in which the primary contact and a directional contact form a closed circuit. The corresponding structure is either a “ball bearing or a mercury contact.” ('731, 4:8-10, Fig. 1.) The prior art,

however, discloses this limitation regardless of whether it is considered to be a means-plus-function limitation.

VI. PRIOR ART

A. Status

Each of the relied-upon references is prior art. Dance (EX1004), Kuo (EX1005), and Moritome (EX1010) are prior art under at least §102(e). Beuk (EX1006), Dornbusch (EX1008), Uragami (EX1015/EX1009), Zwern (EX1007), Titus (EX1011), and Nakano (EX1026/EX1027) are prior art under at least §102(b). Because Uragami and Nakano were originally published in Japanese, Petitioner has provided certified English translations (EX1009, EX1026). All citations use the English translations.

B. Overview of Grounds

“Handheld computing and communication devices [were] well known” before the ’731 patent. (’731, 1:24-25.) “Typically, these handheld device [sic] have a processor connected to a memory, a screen and a user input device.” (’731, 1:25-27.) “These directional input devices allow a user to select options, launch applications, and move pointers or cursors.” (’731, 1:35-37.)

This IPR Petition presents two separate sets of grounds that all challenged claims were obvious over: (1) Dance-based grounds or (2) Dornbusch-based grounds. Either set of independent grounds alone would render the claims

unpatentable.

Dance-Based Grounds

U.S. Patent No. 6,937,272 to **Dance** (EX1004) discloses a camera that a user can tilt to select an image for review and to navigate through an image. (Dance, 4:52-5:19, Figs. 5A-5B.)

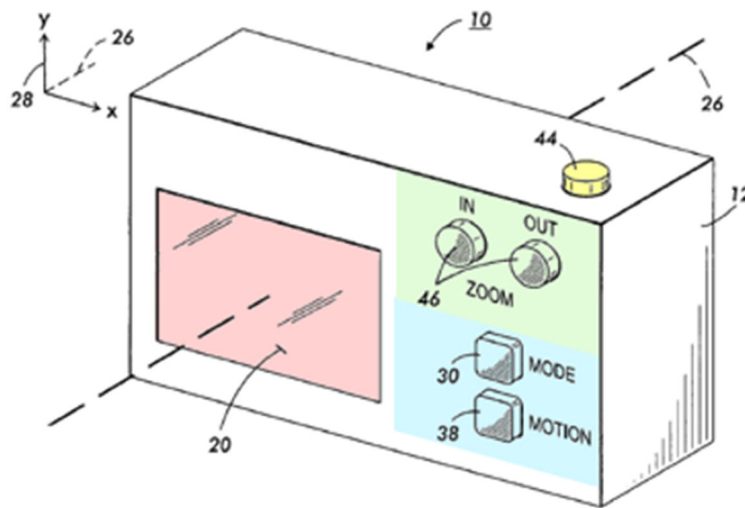


FIG. 1

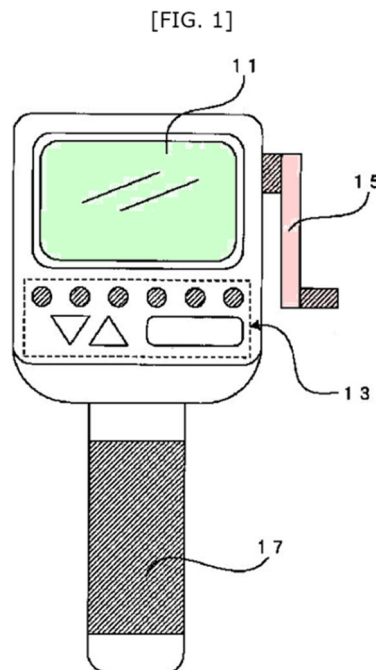
(*Id.*, Fig. 1 (highlighting added).) Dance’s “selection and/or display of a stored image is controlled” using a motion sensor and “physical movement of the camera.” (*Id.*, 2:45, Abstract.) Dance also teaches “manually operable controls” to “enable the user to select an image to view, and then to zoom and scroll the display over the retrieved image.” (*Id.*, 1:23-29.) For additional implementation details for Dance’s digital camera, U.S. Patent No. 6,400,471 to **Kuo** (EX1005) discloses an operating

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system with a processor and memory (2:26-31, 5:50-53, 7:53-65, 2:40-41, Figs. 2-4, 9:33-35), and U.S. Patent No. 5,910,797 to **Beuk** (EX1006) discloses details for tilt-based controls (Figs. 2, 4).

Dornbusch-Based Grounds

Another independent ground is based on **Dornbusch** (U.S. Patent No. 5,232,223, EX1008) and **Uragami** (Japanese Patent Publication No. H11-188182, EX1009/EX1015). Both teach fishing game controllers using motion sensing inputs and a crank. (Dornbusch, 1:11-13, 1:7-10; Uragami, Fig. 1.)



(Uragami, Fig. 1 (highlighting added), [0021], [0003], Fig. 2, [0008], [0016].)

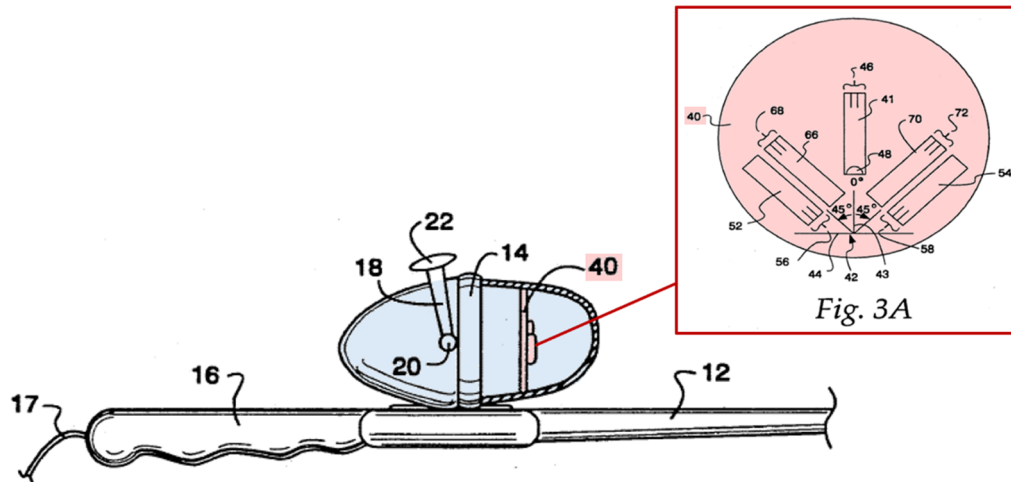


Fig. 3B

(Dornbusch, Figs. 3A, 3B (annotations added).) Dornbusch discloses that the orientation of the fishing rod to the right or the left can control corresponding motion of graphical elements including a boat or a lure in the game. (*Id.*, 9:40-68, 8:10-24, 10:28-40, Figs. 4-5, 5:21-6:24.) Dornbusch's controller also allows a user to control gameplay by turning the crank. (*Id.*, 8:10-24, 9:21-39, 10:28-40, 8:48-65.) For additional detail about the crank, U.S. Patent No. 6,589,117 to **Moritome** (EX1010) describes that the handle can rotate in two directions (7:46-50). For additional detail about the controller, **Nakano** (Japanese Patent Application Publication No. 200-148694, EX1026/EX1027) describes the operating system. (Nakano, [0141].)

Dependent Claims

The '731 patent describes a circuit closing means “as a ball bearing or a

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mercury contact[.]” (’731, 4:8-10, claims 2, 3.) Dornbusch teaches mercury switches. But for detail about tilt switches, U.S. Patent No. 5,955,713 to **Titus** (EX1011) teaches determining the orientation of a device based on a movable ball that closes and opens circuits depending on orientation. (Titus, Fig. 1B.)

Certain dependent claims require a “detected movement pattern” such as a “flick of the wrist.” (*E.g.*, ’731, claim 14.) For detail about movements, International Patent Application No. WO 00/17848 to **Zwern** (EX1007) teaches a flick of a wrist can correspond to a command. (Zwern, 29:25-26, Figs. 13-14.)

VII. CHALLENGED CLAIMS ARE UNPATENTABLE

A. Claim 1 is Obvious Over Dance (Ground 1), and Obvious Over Dance in View Kuo and Beuk (Ground 2)

1. Claim 1

(a) **“A handheld computing device, comprising:”**
(Claim 1[p])

Dance discloses a **“handheld computing device,”** such as a
“portable” camera:

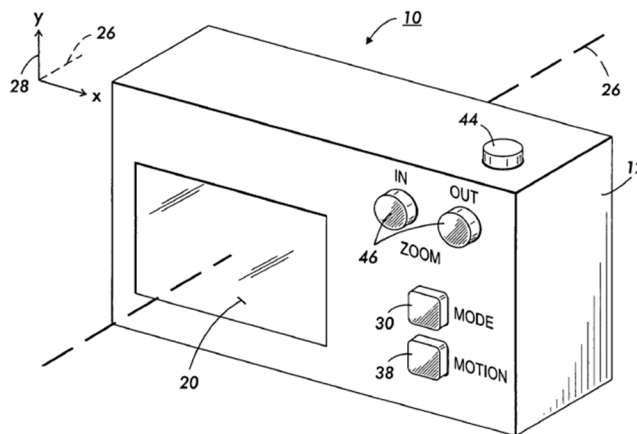


FIG. 1

(Dance, Fig. 1, 2:43-44 (“portable document imaging camera” (emphasis added)), 1:6-7, 1:14-17, 2:17-19, 2:43-44, 1:19-22 (“hand held digital cameras”); Polish, ¶¶87-90.) Dance discloses that its camera system can be implemented using a “processor.” (E.g., ’731, 1:24-29 (“handheld device [sic] have a processor connected to a memory, a screen”), 2:17-19.) A POSITA would have understood that a camera, including a processor and a memory, is a “**computing device**.” (Dance, 2:17-19; Polish, ¶90; Kuo, 1:26-27; EX1022, p.008 (“digital camera is a computer”); EX1023, p.029.)

(b) “a display” (Claim 1[a])

Dance discloses “**a display**”—display 20:

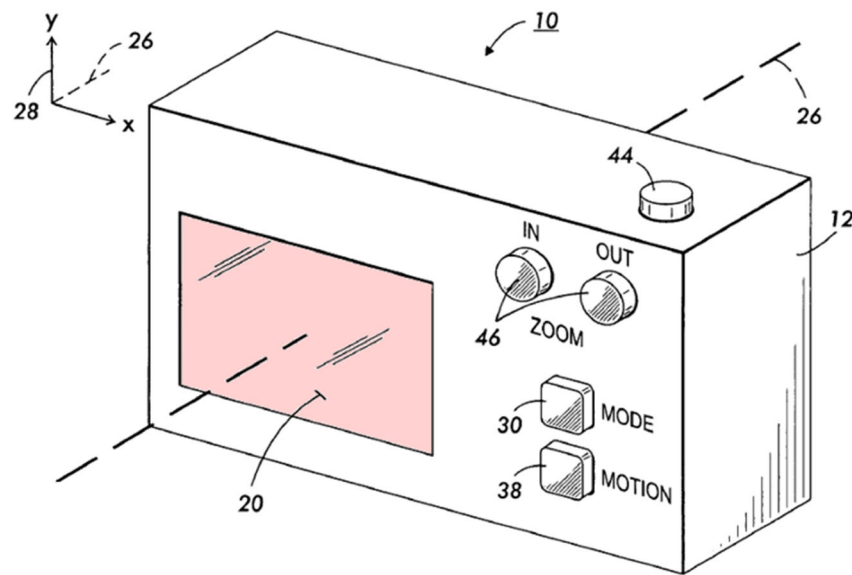


FIG. 1

(Dance, Fig. 1 (highlighting added), 2:66-3:4 (“display”); Polish, ¶¶91-92.)

- (c) **“an internally located directional input device providing a directional input signal, the directional input signal corresponding to an axis of inclination of the handheld computing device and indicating an orientation” (Claim 1[b])**

Dance discloses claim 1[b]. Dance’s motion sensing device 24 is
“an internally located directional input device” inside the camera:

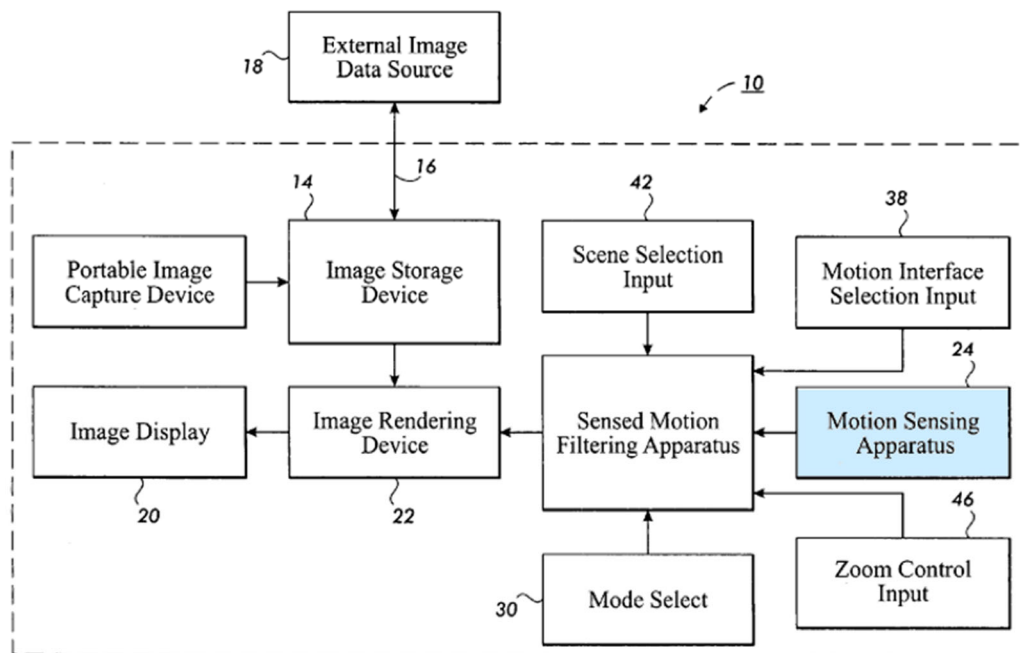


FIG. 2

(Dance, Fig. 2 (highlighting added), Fig. 1; Polish, ¶¶93-98.) Dance’s motion sensing device is a “**directional input device**” that can indicate the direction of tilt of the camera, and a scrolling direction. (Dance, Fig. 2, 3:32-39, 4:58-63, 5:9-11, 3:19-23 (“control the displayed image based on the user’s movement of the camera”), Figs. 2, 4, 5B, 6, 3:32-39, 4:58-63, 5:9-11; Polish, ¶94.) Dance discloses the motion sensing device 24 “provid[es] a **directional input signal**”:

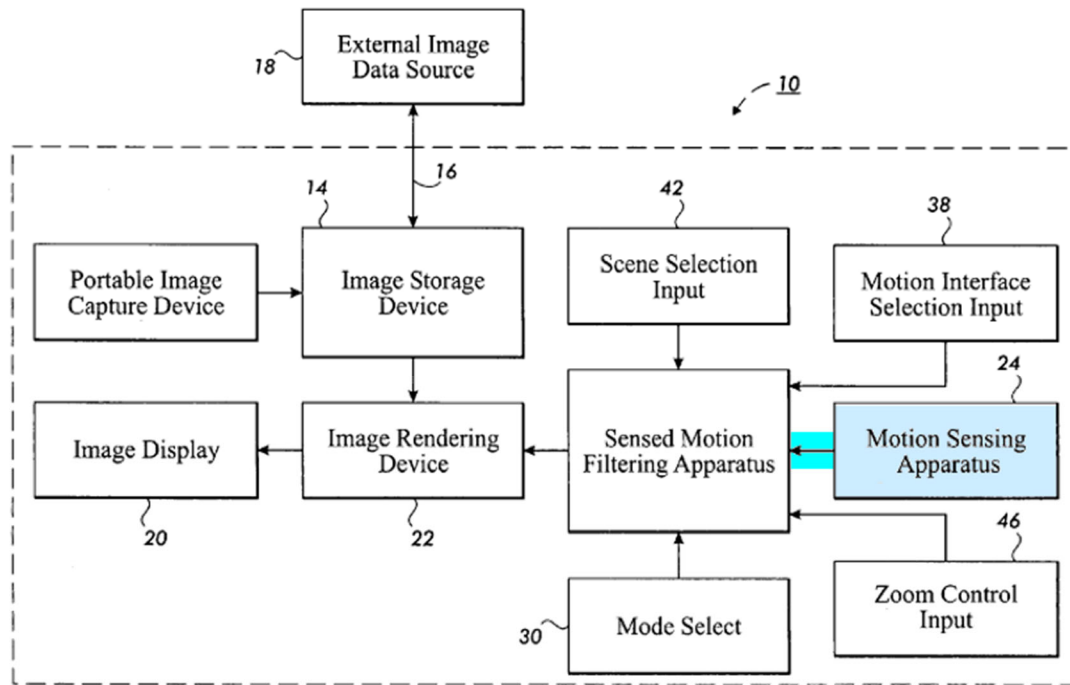
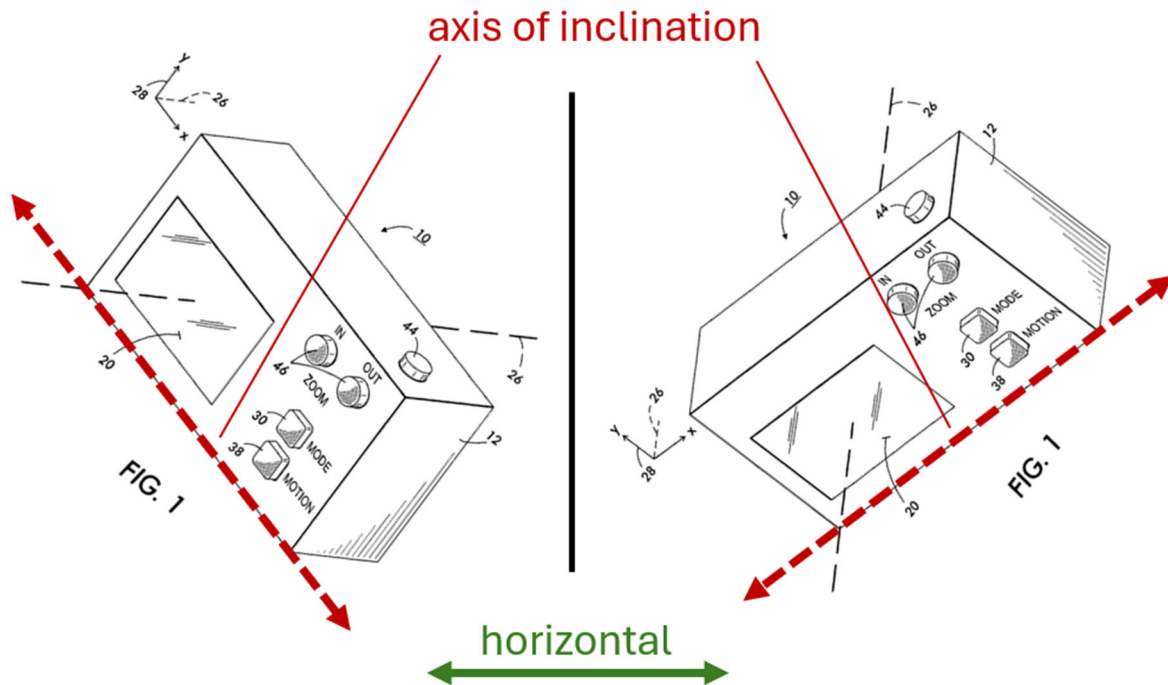


FIG. 2

(Dance, Fig. 2 (highlighting added), 3:19-23; Polish, ¶¶94-95.) This signal “correspond[s] to an axis of inclination of the handheld computing device.”

(Dance, 3:19-23, Fig. 2; Polish, ¶95.) Specifically, using motion sensing device 24, the camera measures whether it is tilted to the right or left—corresponding to “an axis of inclination”—i.e., the inclination of the handheld computing device with respect to horizontal:



(Dance, Fig. 1 (color annotations added), Fig. 2, 3:32-39, 4:58-63, 5:9-11; Polish, ¶95.) The output signal from Dance’s motion sensing device 24 “**indicat[es] an orientation**” of the camera with respect to its axis of inclination. (Polish, ¶96; Dance, 3:32-38 (“tilting the camera in a certain direction effects scrolling of the display in a corresponding direction”), 3:27-31, 3:39-41, Fig. 1, 4:60-65, 5:9-11.)

- (d) “a second directional input device providing a second directional input signal, the second directional input signal indicating an amount of displacement” (Claim 1[c])

Claim 1[c] is disclosed by or obvious over Dance. Dance discloses “a second directional input device”—the “**zoom control input device 46**”:

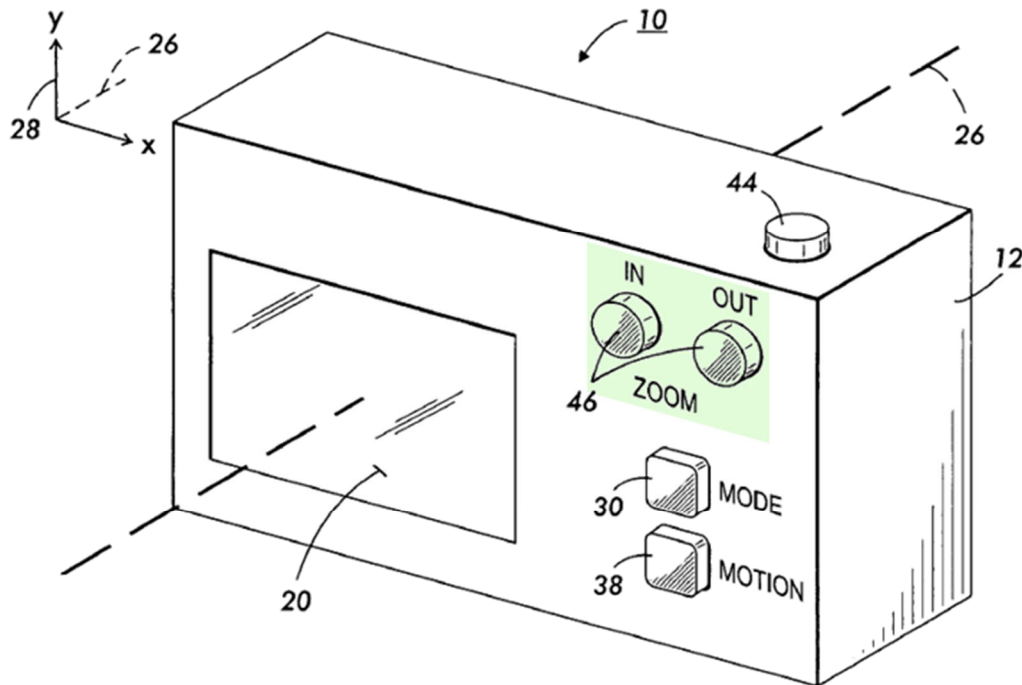


FIG. 1

(Dance, Fig. 1 (highlighting added), 4:43-51; Polish, ¶¶100-110.) Dance's buttons are an **"input device"** allowing the user to provide input for "zoom control." (Dance, 4:43-51, 5:4-9 ("input buttons 46"), Fig. 2, 5:65-67; Polish, ¶102.) The buttons are a **"directional input device,"** including because they allow the user to provide input in two directions (i.e., in or out) and cause directional change on the display (i.e., zooming in or out of the image). (Dance, Fig. 1, 5:4-9 ("user zooms in to enlarge a portion of the image, while panning the image left, i.e. to zoom towards the top left of the document image"), 4:43-51; Polish, ¶103.)

Dance's buttons are a **"second"** directional input device separate from the

motion sensors that constitute the “**first**” directional input device. (Polish, ¶¶104-105.) Figure 2 shows the **Motion Sensing Apparatus 24** block (first “**directional input device**” (*e.g.*, claim 1[b])) as separate from the **Zoom Control Input 46** block (“**second directional input device**”).

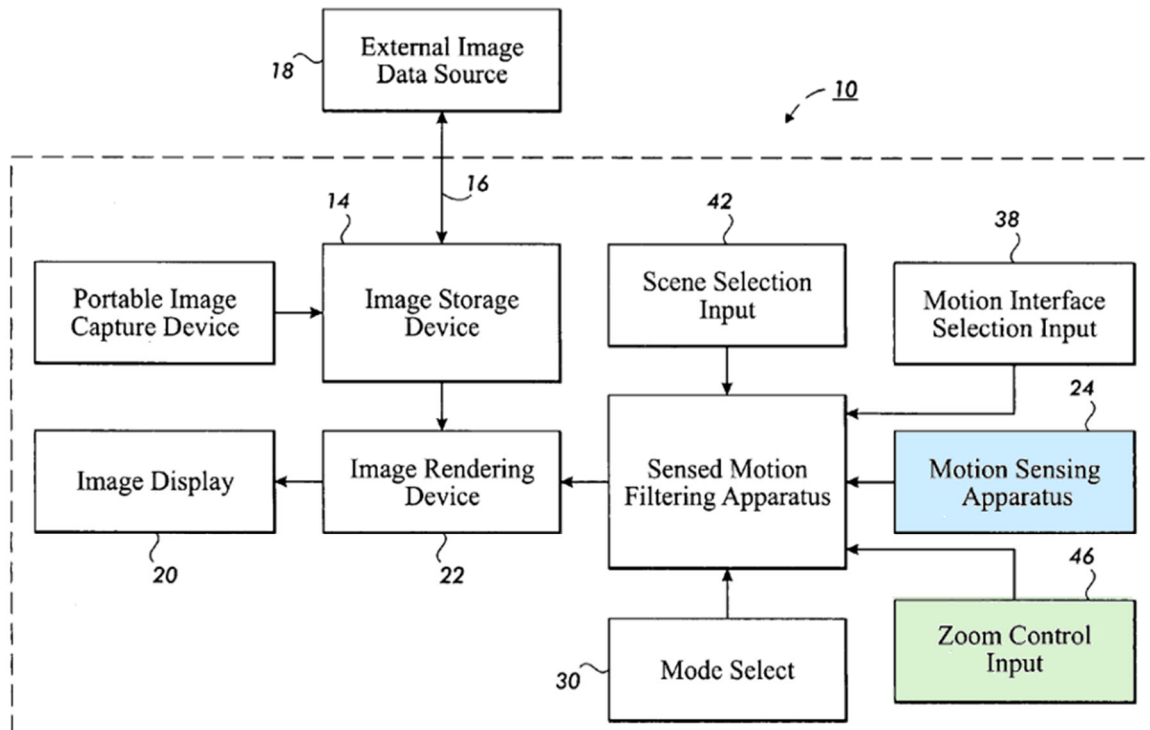


FIG. 2

(Dance, Fig. 2 (highlighting added), 4:43-51, 4:21-27, Fig. 1, 5:4-9, 4:43-51; Polish, ¶¶104; '731, 10:48-51, 2:56-60 (“buttons” and “arrow keys”), 8:40-43, 8:33-39, 1:41-43; Polish, ¶105.)

Dance also discloses that the zoom input 46 can be implemented as “an accelerometer 82 mounted for sensing acceleration in the ‘z’ direction, i.e. parallel to the axis 26.” (Dance, 6:19-29, 5:39-49, 4:43-51, 5:4-9, 6:7-15, Fig. 7.) Thus,

Dance's accelerometer for detecting “z”-axis motion of the camera is a further feature in Dance that satisfies the “**second directional input device.**” (Polish, ¶106.)

Dance's buttons provide a “**second directional input signal**” to the “Sensed Motion Filtering Apparatus”:

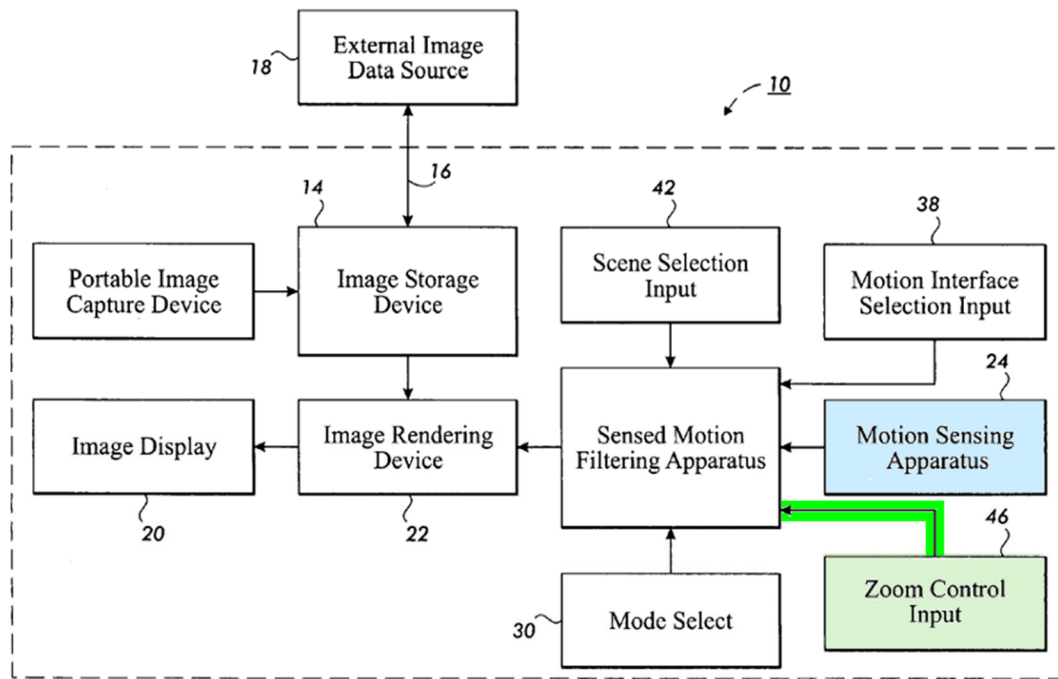


FIG. 2

(Dance, Fig. 2 (highlighting added), 4:43-51, 5:65-67; Polish, ¶¶107-110.)

Dance's “**second directional input signal**” “indicat[es] an amount of displacement”—i.e., the “panning speed depending on the current level of zoom” (i.e., velocity of motion for control of image navigation). (Dance, Fig. 6, Fig. 2, 5:56-67, 6:19-29; Polish, ¶¶108-109.) A POSITA would have also understood that

a similar structure would apply to the tilt control context, with a signal from the motion sensors (e.g., indicating tilt) being combined with zoom input information (e.g., coefficient “k”) to set scrolling rate. (Dance, 5:4-11, 3:32-38, 5:52-67, Fig. 6; Polish, ¶110.) Dance provides a motivation, and a reasonable expectation of success, to implement dynamic scrolling velocity based on zoom level in tilt controls. (Dance, 5:60-65, 3:32-38, 4:60-63, 5:9-11; Polish, ¶110.)

Alternatively, claim 1[c] is obvious over Dance in light of **Beuk** (EX1006). Beuk teaches scrolling at a constant velocity in the tilt direction regardless of how much the device is tilted. (Beuk, 2:9-19, 4:1-14, 1:7-14, 4:9-10, 4:12-14, Fig. 4, 5:7-9; Polish, ¶¶111-112, 56-59.) Figure 4 shows curves for how the velocity of an object shown on the display (e.g., text to be scrolled) varies based on the orientation of the device. (Beuk, 4:2-3, 4:12-14, Fig. 4; Polish, ¶¶112-114.) One of the curves (highlighted) indicates that once the orientation passes a certain threshold angle, the velocity of the object remains constant regardless of how much further the angle increases:

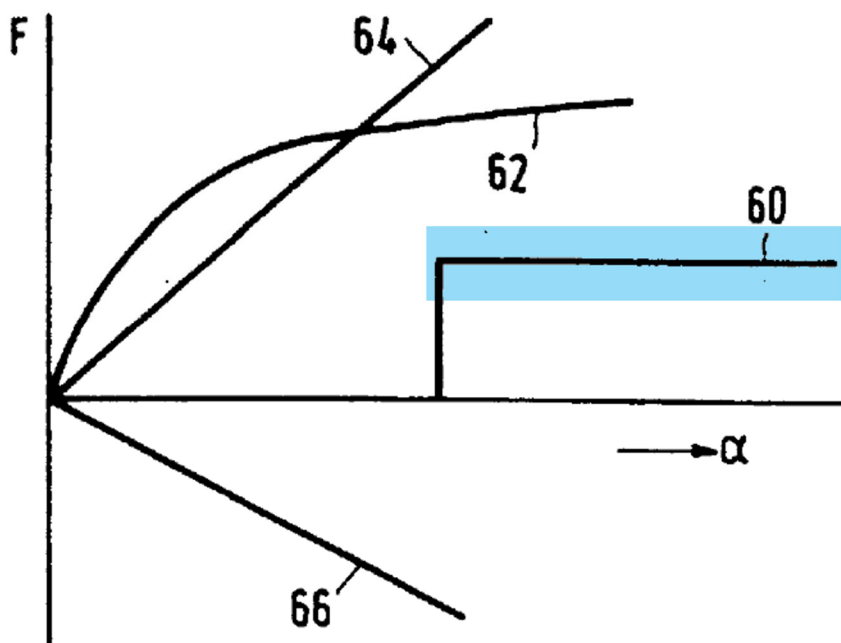
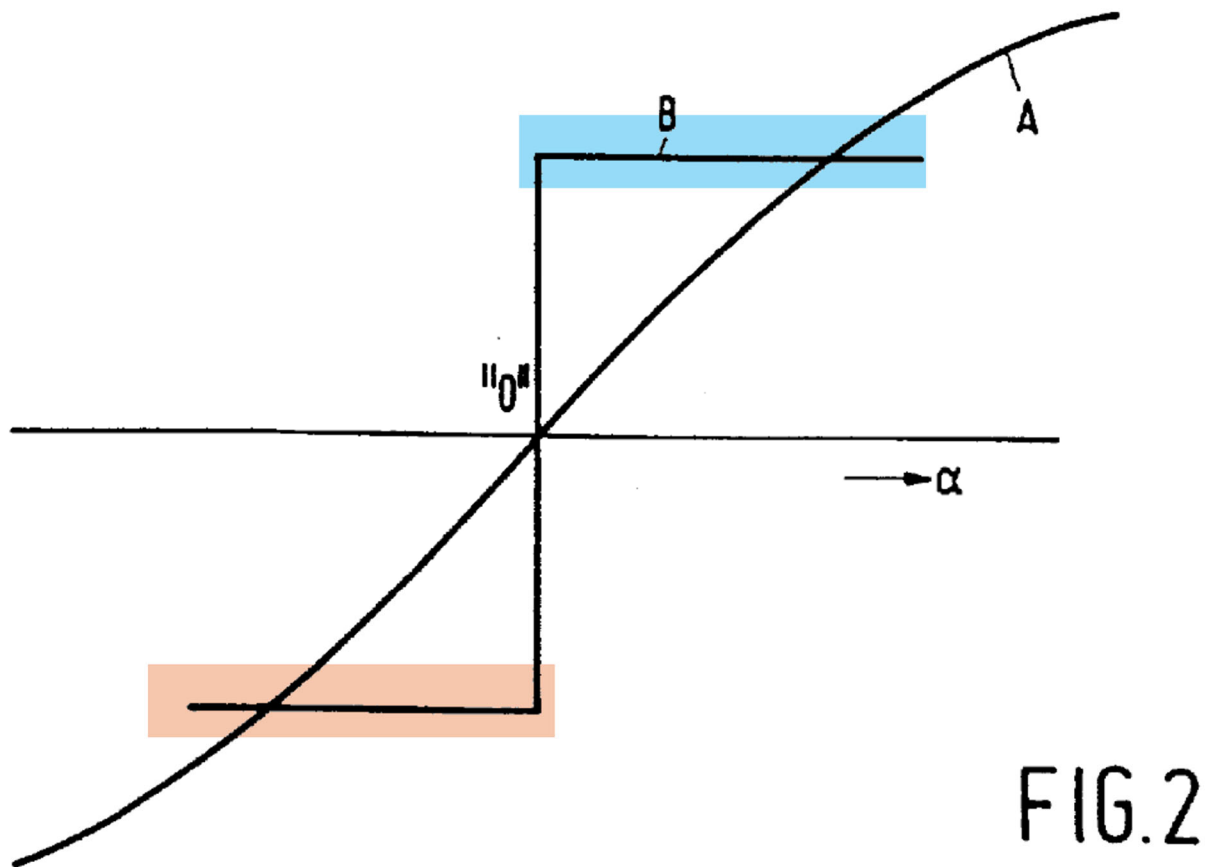


FIG. 4

(Beuk, Fig. 4 (highlighting added), 4:9-14; Polish, ¶113.)

Beuk also discloses tilt-based scrolling by outputting one signal value when the inclination is negative (e.g., device tilted left) and another signal value when the inclination is positive (e.g., device tilted right). (Beuk, 3:19-22, Fig. 2; Polish, ¶114.) Figure 2 shows the signal value output when the inclination is negative and the signal value output when the inclination is positive.



(Beuk, Fig. 2 (highlighting added), 3:19-22; Polish, ¶114.) In both figures, only the direction of tilt is used to determine the output signal. (Polish, ¶¶113-114.)

It would have been obvious to implement Dance's tilt scrolling such that scroll velocity is independent of tilt magnitude, like in Beuk. (Polish, ¶¶113-119.) For example, Dance's tilt scrolling could be implemented like curve 60 in Figure 4 of Beuk. (Polish, ¶114.) Once the tilt of the device exceeds a certain threshold in a direction, Dance's camera would cause scrolling on the display in that direction at a velocity that does not change if the tilt further increases. (Polish, ¶114.)

This constant velocity output by the motion sensing circuitry would then be multiplied by the coefficient “k” derived from the zoom setting 46. (*Id.*) Accordingly, the scroll velocity on Dance’s system would vary only with changes in “k.” (Dance, Fig. 6; Beuk, Figs. 2, 4; Polish, ¶114.) Changes in tilt magnitude (above the threshold) would not impact the scroll velocity. (*Id.*) A POSITA would have understood that the combined system could be implemented using signals similar to those shown in Beuk’s Figure 2. (*Id.*) Thus, in the combined system, there is “**a second directional input device [tilt sensor] providing a second directional input signal, the second directional input signal indicating an amount of displacement**” [coefficient “k,” which determines the scroll velocity]. (Polish, ¶¶111-120.)

Motivation to Combine: Both Dance and Beuk are analogous art to the ’731 patent because they are related to devices capable of sensing motion and orientation of the device. (Dance, 2:43-44, 3:32-39, 4:58-63, 5:9-11; Beuk, 1:7-14, 2:9-19; ’731, 1:16-17; Polish, ¶¶115-119.) Both attempt to provide a solution for a purported problem of the ’731 patent – providing a user-friendly device that is capable of motion and orientation sensing. (’731, 3:54-57; Dance, 2:6-9; Beuk, 1:17-21; Polish, ¶119.) Both pertain to using orientation or tilt of handheld devices for controlling a user interface. (Dance, 3:32-38, 4:58-65, 5:9-11, 1:13-17, 1:19-20;

Beuk, 1:25-29, 2:42-3:12, 4:1-14, Figs. 2, 4; Polish, ¶115.) A POSITA would have been motivated to combine Dance with Beuk for implementation details of tilt scrolling in Dance's system. (Polish, ¶116.) To implement Dance's Figure 6 for linear motion control, (Dance, 5:34-6:18, Fig. 6), a POSITA would have looked to Beuk for those implementation details, since Beuk discloses specifics for how tilt controls can work. (Beuk, 1:25-29, 2:42-3:12, 4:1-14, Figs. 2, 4; Polish, ¶116.) A POSITA would have been motivated to combine Dance with Beuk to provide users with simpler tilt control. (Polish, ¶117.) Dance indicates that the sensitivity of motion controls is a factor that should be considered. (Dance, 5:61-65, Fig. 6; Polish, ¶117.) A POSITA would have had more than a reasonable expectation of success and could have implemented the proposed combination using conventional techniques. (Polish, ¶¶115-119.) As Dance discloses scroll velocity that varies with *both* motion sensing and zoom input, it would have been straightforward to implement a simpler system of scroll velocity that *only* varies scroll velocity based on zoom input. (Polish, ¶118.)

- (e) **“a processor coupled to the internally located directional input device and the second directional input device and operable to receive and process the directional input signal in conjunction with the second directional input signal; and” (Claim 1[d])**

Claim 1[d] is disclosed or rendered obvious by Dance. Dance discloses a “**processor**”—i.e., the combined functionality of image rendering device **22** and the

sensed motion filtering apparatus. (Dance, 2:17-19 (“processor”), Fig. 2 (image rendering device and sensed motion filtering apparatus), 3:5-18, 3:52-64, 6:7-15, Fig. 6; Polish, ¶¶122-127.) Dance discloses that “control[]” of its digital camera is performed by a program “run on a processor,” which indicates that image rendering device **22** (performing control operations on the digital camera) constitutes a **“processor,”** which is **“operable to receive and process the directional input signal.”** (Dance, 2:17-19, 1:13-20, 3:5-23, 3:52-64, 4:15-42, 6:7-15, 6:19-29, Figs. 2, 6; Polish, ¶¶124-127.) Dance’s sensed motion filtering apparatus also satisfies the **“processor”** element. (Dance, Fig. 6, 5:39-6:15; Polish, ¶¶125-127.) The math performed by the virtual velocity gain circuit **78** or the multiplier **76** would be performed by a processor. (Dance, 2:17-19, 1:13-20; EX1021, pp.010, 017; EX1024, p.041; Polish, ¶125.) Dance thus renders obvious **“process[ing] the directional input signal in conjunction with the second directional input signal.”** (Polish, ¶¶121-125.) The signals from the directional input devices are processed **“in conjunction”** with each other—*e.g.*, they are processed together and are both used to determine how to change the camera display. (*Id.*, 5:56-6:18, Fig. 6; Polish, ¶126.)

Dance discloses that image rendering device **22** and sensed motion filtering apparatus (**“processor”**) is **“coupled to the internally located directional input**

device and the second directional input device.” (Polish, ¶126.) Dance discloses that image rendering device **22** receives inputs from the motion sensing device **24** (“**internally located directional input device**”) and the zoom control input **46** (“**second directional input device**”). (Dance, 3:19-23, 6:27-29, 6:10-15; Polish, ¶126.)

It would have also been obvious to implement Dance’s camera with a processor executing operating system instructions stored on a memory, including for receiving and processing images (including a graphical user interface) on the display. (EX1005, 1:26-27; Polish, ¶127.) A POSITA would have been motivated to implement Dance’s camera as a standalone device (including processor, memory, and an operating system for providing a graphical user interface). (Polish, ¶127; EX1005, 1:26-27.) Figure 1 shows a self-contained device with no external hardware or software required:

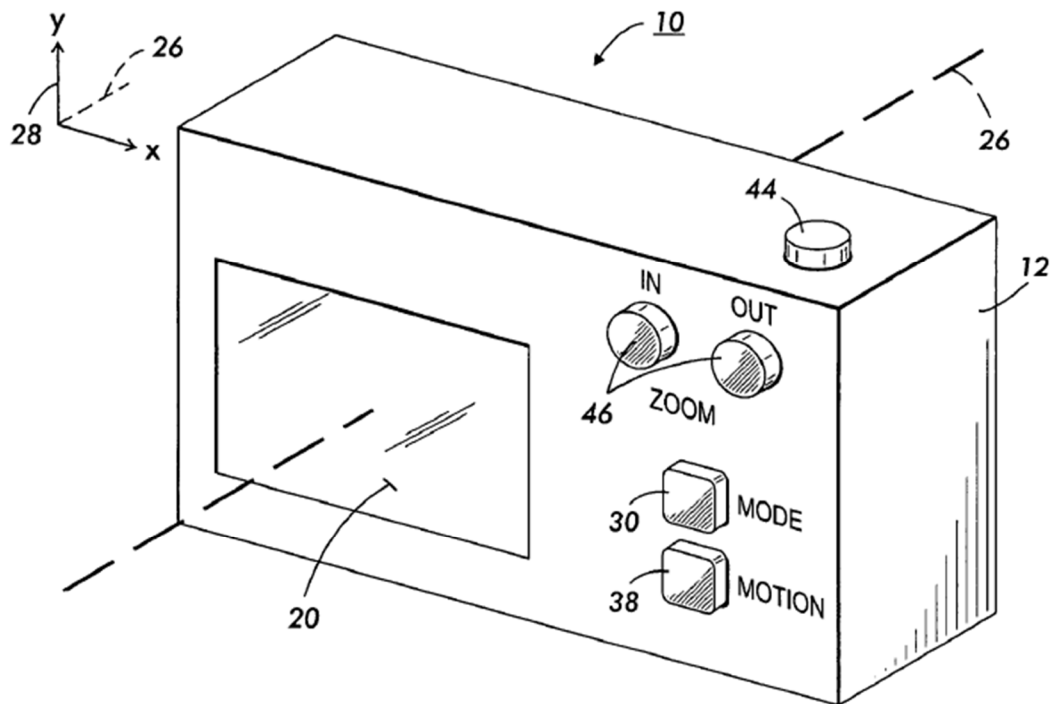


FIG. 1

(Dance, Fig. 1; Polish, ¶127.)

Alternatively, claim 1[d] is obvious over Dance in light of **Kuo** (EX1005). It would have been obvious to implement Dance's camera with Kuo's components. Kuo discloses a camera including a central processing unit (CPU) **344**, which may include "a conventional processor device for controlling the operation" of the camera. (Kuo, 3:35-54 (emphasis added), Fig. 2, 2:18-24, 2:32-47, Abstract, Figs. 3A-3B; Polish, ¶¶128-131, 53-55.) The CPU **344** is coupled to various input devices on the camera, including buttons **404** for the user to control a graphical user interface. (Kuo, 5:50-53, 5:42-47, 5:59-63; Polish, ¶129.) Kuo also discloses a

“memory unit coupled to the bus,” which has “an operating system for managing the image processing subsystem,” including “menu-driven graphical user interface (GUI) and software image processing.” (Kuo, 2:34-41 (emphasis added), 5:50-53, 7:53-65, Figs. 3A-3B, 4; Polish, ¶130.) The combination of Dance and Kuo would have predictably resulted in and rendered obvious a “**processor coupled to**” the “**directional input device[s]**” and operable to “**receive and process**” the “**directional input signal[s]**.” (Polish, ¶131; Kuo, Fig. 2, 5:35-54, 5:50-53, 5:42-47, 5:59-63.)

Motivation to Combine: Both Dance and Kuo are analogous references to the '731 patent. (Polish, ¶¶133-141.) Like the '731 patent, Kuo relates to user control of a handheld device with a display. (Kuo, 2:18-24, 2:32-47, Abstract, 5:35-54, Figs. 3A-3B; '731, 1:16-20, 1:65-2:10, 3:54-61; Polish, ¶141.) Kuo addresses a purported problem of the '731 patent – a need for user-friendly handheld devices with a display. (Kuo, 4:30-34; '731, 3:54-61; Polish, ¶141.) Dance and Kuo are analogous references in the same field – both relate to digital cameras. (Dance, 2:17-19, 1:11-17, 1:19-20; Kuo, 1:5-7; Polish, ¶¶133-136.) Both disclose graphical user interfaces to control their cameras and select items. (Dance, 2:1-5, 3:5-18, 3:52-4:14, 4:52-5:3; Kuo, 5:50-53, 7:53-65, 6:61-63; Polish, ¶134.) Both relate to reviewing photos. (Dance, 2:1-5, 3:5-18, 4:66-5:11; Kuo, 6:61-63, 6:38-42; Polish,

¶135.) Both designs have similar structures:

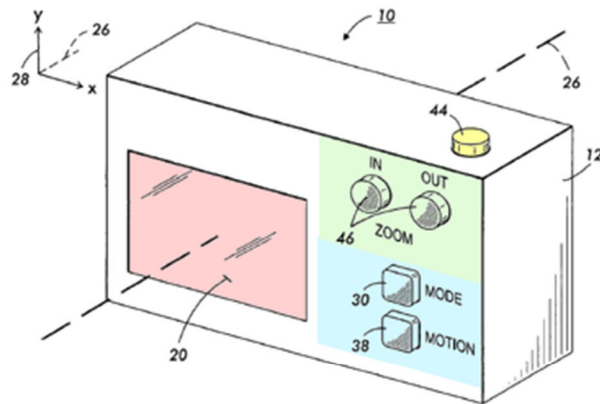


FIG. 1

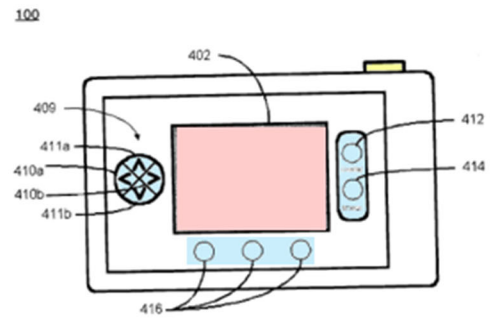


Figure 3A

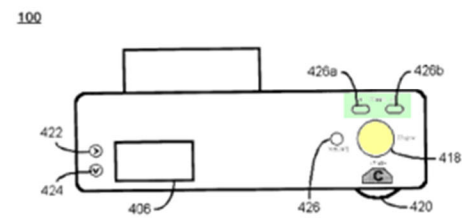


Figure 3B

(Dance (left), Fig. 1 (highlighting added), 3:24-31, 4:36-42; Kuo (right), Figs. 3A-3B (highlighting added), 6:43-7:11; Polish, ¶136.) A POSITA would have been motivated to combine Dance with Kuo for implementation details for Dance's design. (Dance, 2:17-19, 2:50-58, Fig. 2; Kuo, 1:26-27; Polish, ¶137.) Kuo discloses a flexible operating system "that can be utilized with the image processing mode used by any digital camera platform," and its teachings may lead to greater efficiency and lower costs. (Kuo, 2:18-20, 1:60-2:17, 1:40-51; Dance, 3:5-23, 3:52-64, 4:15-42, 6:7-15, 6:19-29, Figs. 2, 6, 2:17-19, 1:13-20; Polish, ¶¶138-139.) A POSITA would have been motivated to implement Dance's digital

camera system using a processor executing an operating system stored in memory.

(Polish, ¶139.) A POSITA would have had more than a reasonable expectation of success for the combination, and could have implemented the combination using conventional techniques. (Polish, ¶140; Kuo, 5:53-54; 2:18-20; 1:60-2:24.) Additionally, as addressed in more detail below, a POSITA would have been motivated to combine Dance with Beuk for implementation details of tilt scrolling in Dance’s system. (Polish, ¶¶159-165.) Both are analogous references, are similar to the ’731 patent, and a POSITA would have been motivated to combine Dance with Beuk to provide users with straightforward tilt controls. (*Id.*) A POSITA would have had more than a reasonable expectation of success and could have implemented the proposed combination using conventional techniques. (Polish, ¶164.)

- (f) **“a memory subsystem, the memory storing an operating system executed by the processor to display on the display a graphical user interface for controlling the operation of the handheld computing device, wherein the graphical user interface provides a graphical element” (Claim 1[e])**

Dance renders obvious claim 1[e]. Dance discloses that its camera has a “storage medium **14**,” and the camera can store and retrieve images from the storage medium to show on the camera’s display **20**. (Dance, 2:66-3:1, 2:50-55 (“memory”), 3:7-9 (“storage medium”), 5:1-3, 2:59-65; Polish, ¶¶143-145.)

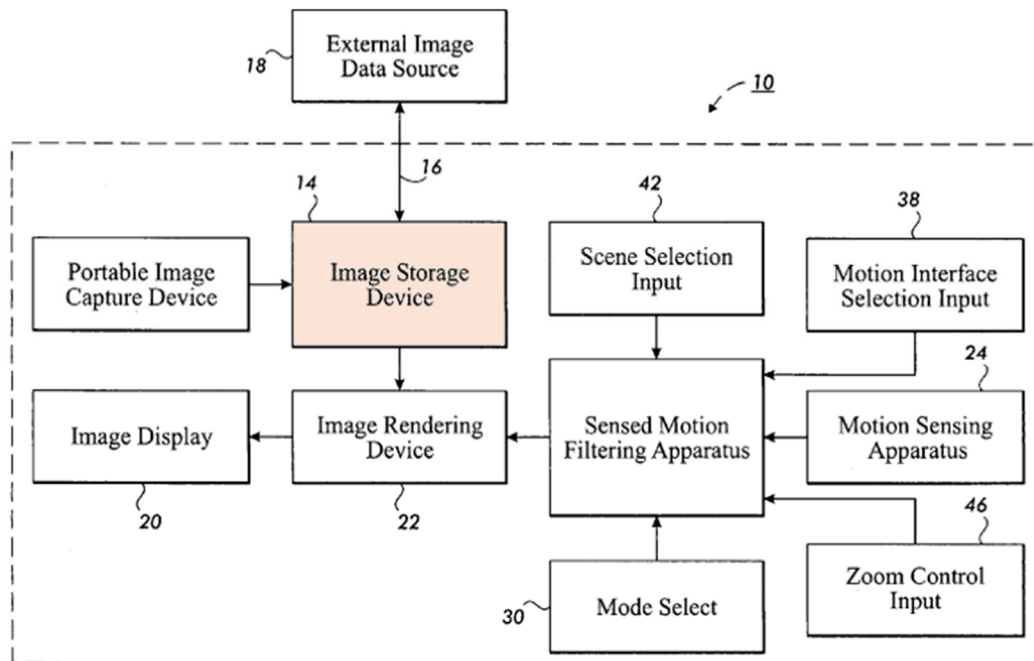
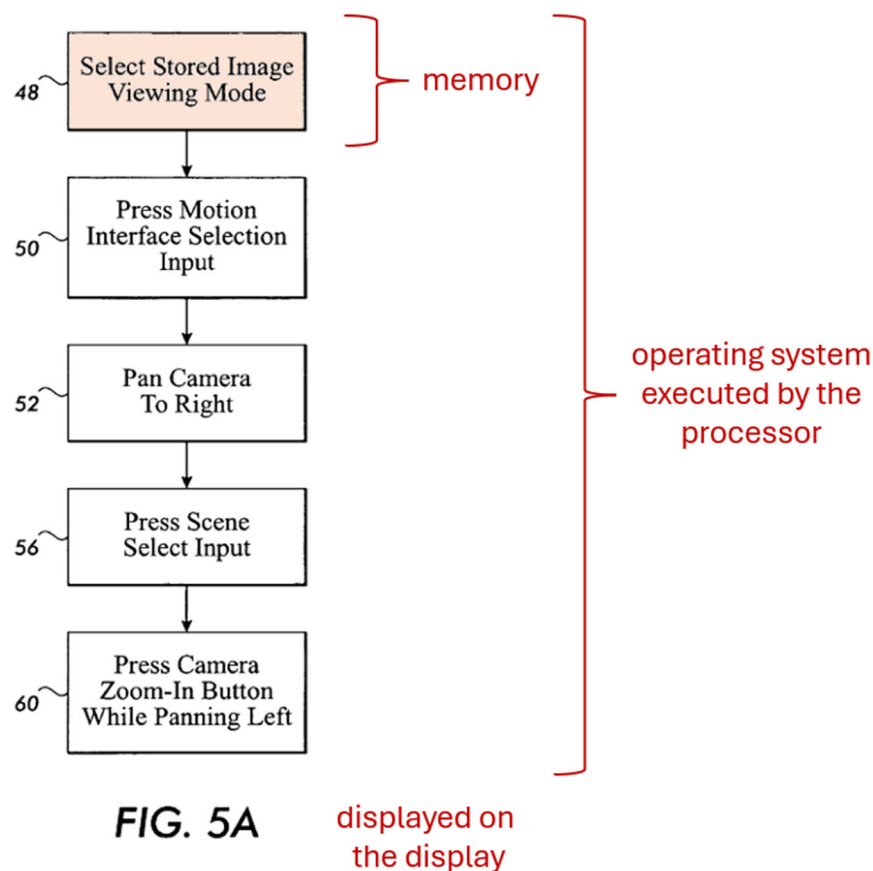


FIG. 2

(Dance, Fig. 2 (highlighting added); Polish, ¶¶144-145.) Dance discloses the claimed “**memory subsystem.**” (*Id.*) Dance further renders obvious a “**memory storing an operating system executed by the processor.**” (Dance, Figs. 5A-B, 4:52-5:34; Polish, ¶145.) For example:



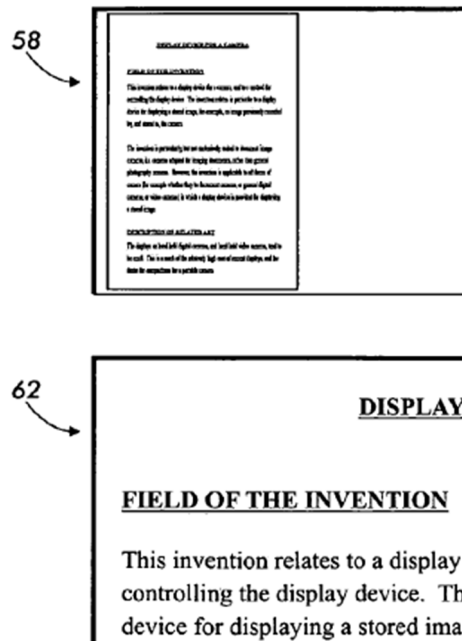
(Dance, Fig. 5A (annotations added); Polish, ¶145.) A POSITA would have understood that Dance would be implemented via a locally stored “**operating system executed by the processor**,” including to facilitate a self-contained handheld camera (e.g., “**to display on the display a graphical user interface**”) that can be operated without a connection to other devices. (Polish, ¶145; Dance, 1:19-20, Fig. 1; EX1005, 1:26-27.)

Dance discloses “**display[ing] on the display a graphical user interface for controlling the operation of the handheld computing device.**” As explained

above, Dance teaches a “display,” a “handheld computing device,” and “controlling the operation of the handheld computing device.” (Dance, 2:1-5; Figs. 1, 5A-B, Polish, ¶¶87-92, 122-127, 143-157.) As explained below, Dance discloses “**display[ing] on the display a graphical user interface**” as claimed.

“Single Image View”

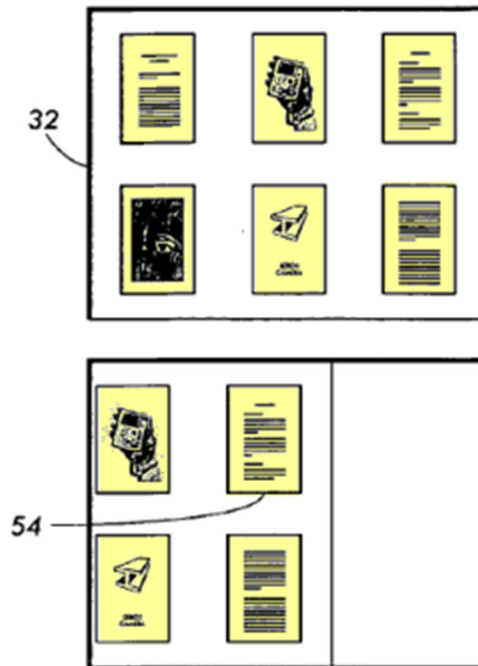
Dance teaches a single image view that is a “**graphical user interface**” that displays information graphically, is controlled by a user, and is an “interface” for controlling the view of an image (e.g., using motion inputs). (Dance, Figs. 1, 5A-B; Polish, ¶¶150-154.) That user interface for viewing an image is “**display[ed] on the display.**” (Dance, 5:1-3, Figs. 1, 5A-B, 2:1-5; Polish, ¶153.) Figure 5B shows a displayed image:



(Dance, Fig. 5B (excerpted), 5:1-11.) The camera display allows the user to zoom and scroll through the image. (Dance, 3:5-38, 4:66-5:11, 5:56-6:15, Figs. 5A-B; Polish, ¶153.) The single image view is “**for controlling the operation of the handheld computing device,**” since it enables the user to control what part of the displayed image is shown on the camera display. (Polish, ¶153.) Dance’s single image view provides the “**graphical element**” of the image currently being viewed. (Dance, 4:66-5:3, 3:16-17; Polish, ¶154.) Dance’s single image view constituting a graphical user interface is consistent with the ’731 patent. (’731, 1:29-31, 1:41-46, 4:1-5, 4:49-52, 5:5-13; Polish, ¶¶153-154.)

“Image Selection Scene”

Another example of a “**graphical user interface**” that Dance teaches is the display in “scene selection mode.” (Dance, 3:55-58, 4:54-57, Figs. 3, 4, 5B; Polish, ¶¶155-157.) Dance discloses a “selection scene **32**,” which is an array of “icons/thumbnailed views **34**” through which a user can navigate to determine the image to view on the display. (Dance, 3:65-4:14, 4:36-42, 4:52-5:25, 3:5-18; Polish, ¶155.) Dance’s image selection interface provides multiple graphical elements (**highlighted**), where each image constitutes a “**graphical element**”:



(Dance, Fig. 5B (excerpted; highlighting added), 1:29-31 (“graphical interface through which options or applications are selected”), 1:41-46 (“user interface” that “involv[es] the displacement of a cursor on a screen”), 4:1-5, 4:49-52, 5:5-13; Polish, ¶¶155-156.)

Dance’s image selection interface is “**for controlling the operation of the handheld computing device.**” (Polish, ¶155.) The image selection interface allows a user to change what is displayed, either by moving left or right along the images shown in the selection interface or selecting a specific image to show in more detail. (Dance, 4:58-5:11, 3:5-18 (“controlling the display of stored images”); Polish, ¶155.)

Alternatively, claim 1[e] is obvious over Dance in light of **Kuo** (EX1005). Kuo discloses that its digital camera includes a “memory unit coupled to the bus,” which “has stored therein an operating system for managing the image processing subsystem[.]” (Kuo, 2:40-41 (emphasis added); Polish, ¶¶146-149.) The operating system is capable of providing a “menu-driven graphical user interface (GUI) and software image processing.” (Kuo, 5:50-53, 7:53-65, Figs. 3A-3B, 4, 5, Abstract (“memory unit has stored therein an operating system for managing the image processing subsystem[.]”), 5:42-43; Polish, ¶147.) The Dance-Kuo combination is further discussed in claim 1[d] above. It would have been obvious for the memory in Dance’s camera to “**stor[e] an operating system executed by the processor to display on the display a graphical user interface for controlling the operation of the handheld computing device,**” as Kuo discloses, as explained above. (Kuo, 2:40-41, 5:50-53, 7:53-65, Figs. 3A-3B, 4; Polish, ¶149.)

Motivation to Combine: As explained above, it would have been obvious to implement Dance’s camera with a “memory subsystem” as Kuo discloses for Dance’s digital camera design. (Polish, ¶¶148-149, 133-141.) A POSITA would have been motivated to look to Kuo for implementation details. (Polish, ¶¶137-138.) Both references are analogous references (and similar to the ’731 patent) and disclose cameras with similar features, systems, and structures. (*E.g.*, Dance, 2:1-5,

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3:5-18, 3:52-4:14, 4:52-5:11, Fig. 1, 3:24-31, 4:36-42; Kuo, 5:50-53, 7:53-65, 6:38-42, Figs. 3A-3B, 6:43-7:11; Polish, ¶¶133-136, 148.) Both also allow reviewing photos. (Dance, 2:1-5 (describing “an interface for viewing stored images”), 3:5-18, 4:66-5:11; Kuo, 6:61-63 (“review mode”), 6:38-42.) And like the ’731 patent, both pertain to “controlling a handheld device.” (’731, 1:16-17; Polish, ¶141.)

Alternatively, claim 1[e] is obvious in light of **Beuk** (EX1006). Beuk teaches implementation details for device tilt for controlling “one or more graphical or other objects presented” on a display, including a dot, a “fixed-shape icon,” or a ball. (Beuk, 3:32-40, 3:45-48, 2:3-8, Abstract, 1:7-13; Polish, ¶159.) It would have been obvious to a POSITA to implement tilt controls for a graphical cursor object in Dance’s camera. (*Id.*)

Motivation to Combine: Dance and Beuk are both analogous references to the ’731 patent. (Polish, ¶¶165, 115, 119.) Like the ’731 patent, both disclose the use of orientation or tilt of an electronic device for controlling a user interface. (Dance, 3:32-38, 4:58-65, 5:9-11, 1:13-17, 1:19-20; Beuk, 1:25-29, 2:42-3:12, 4:1-14, Figs. 2, 4; Polish, ¶115.) A POSITA would have considered a movable graphical cursor element to be a useful feature for a camera that can be used to view images or documents, since a cursor would allow the user to select, highlight, or interact with certain parts of an image or document. (Dance, 1:11-17, 2:43-49, 5:4-19, 4:40-

42, 1:23-30, Fig. 5B; Polish, ¶¶160-162.) Incorporating a moving cursor like Beuk discloses would have made it easier for a user to navigate using Dance’s user interface. (Polish, ¶¶161-163.) The combination would also have enabled a user to zoom in on parts of an image more easily. (*Id.*) A POSITA could have implemented the proposed combination using conventional techniques with a reasonable expectation of success. (Polish, ¶164; ’731, 1:24-37, 2:32-42, 3:27-30.)

(g) **“wherein the operating system comprises processor-executable instructions that cause the graphical element to move by the amount of displacement in a direction substantially parallel or substantially perpendicular to the orientation.” (Claim 1[f])**

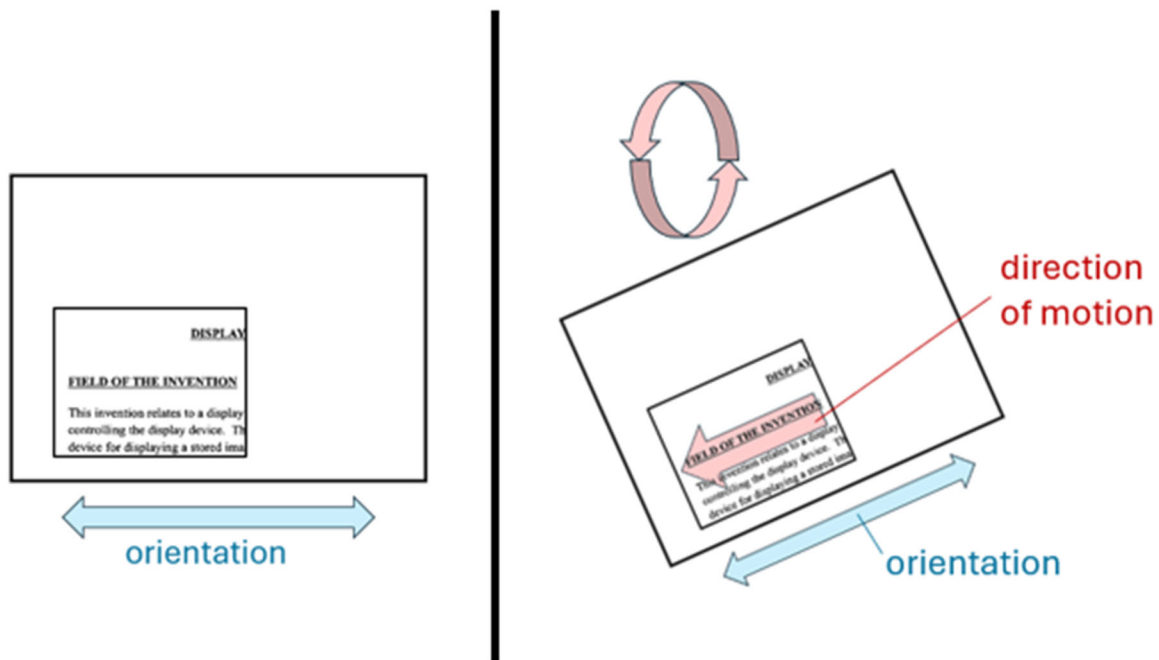
Dance renders obvious claim 1[f]. Dance renders obvious that its digital camera would have an **“operating system compris[ing] processor-executable instructions that cause the graphical element to move.”** (Dance, Figs. 1, 2, 5A-B, 4:52-5:33; Polish, ¶¶167-168.) As explained above, Dance discloses that once an image has been selected for viewing, the display shows that image and allows the user to zoom and scroll through the image. (Dance, 3:5-38, 4:66-5:11, 5:56-6:15, Figs. 5A-B, 5:1-11; ’731 1:29-31, 1:41-46, 4:1-5, 4:49-52, 5:5-13; Polish, ¶¶168, 150-157.) The image selection interface allows a user to change what is displayed on the camera’s display, either by moving left or right along the images shown in the selection interface or selecting a specific image to show in detail. (Dance, 4:58-5:11, 3:5-18 (“controlling the display of stored images”); Polish, ¶168.) As

explained below, Dance discloses “**caus[ing] the graphical element to move by the amount of displacement in a direction [] parallel or [] perpendicular to the orientation.**”¹

“Single Image View”

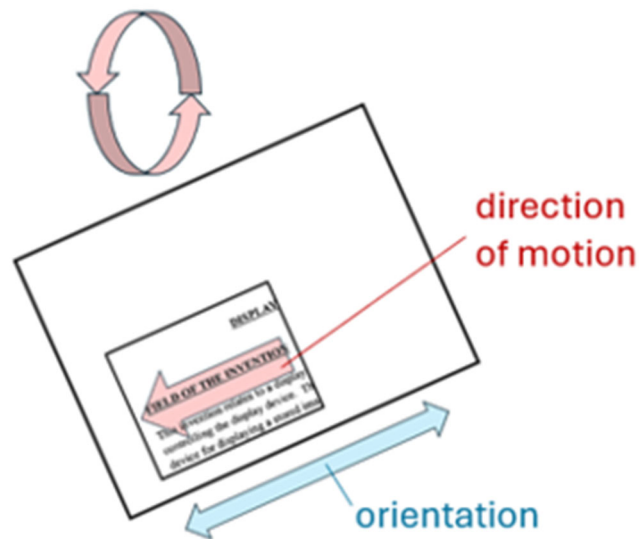
Dance teaches when the camera is tilted in a direction—right or left—then the image shown on the display is moved in that direction—right or left. (Dance, 5:9-11; Polish, ¶¶167-168, 170-173.) The velocity of this panning motion is “determined by a virtual velocity gain circuit **78**,” which depends on the zoom input **46** (i.e., the “**amount of displacement**” indicated by the “**second directional input signal**”). (Dance, 5:56-67; Polish, ¶¶171-173.) Leftward tilt yields leftward motion, which is parallel with the orientation of the device as the screen rotates with the device:

¹ There is a dispute in the pending litigation with respect to the full scope of the modifier “substantially,” but that dispute is not relevant to this IPR as the prior art discloses movement that is actually (and not merely “substantially”) parallel or perpendicular.



(Dance, Fig. 5B (excerpted; annotations added), 3:32-38, 4:60-63; Polish, ¶171.)

The panning motion left is “**in a direction**” that is “**parallel**” to the “**orientation**” of the camera. Tilting the display in other directions causes corresponding movement. Dance is “**caus[ing] the graphical element to move by the amount of displacement in a direction**” that is “**parallel**” to the “**orientation**”:

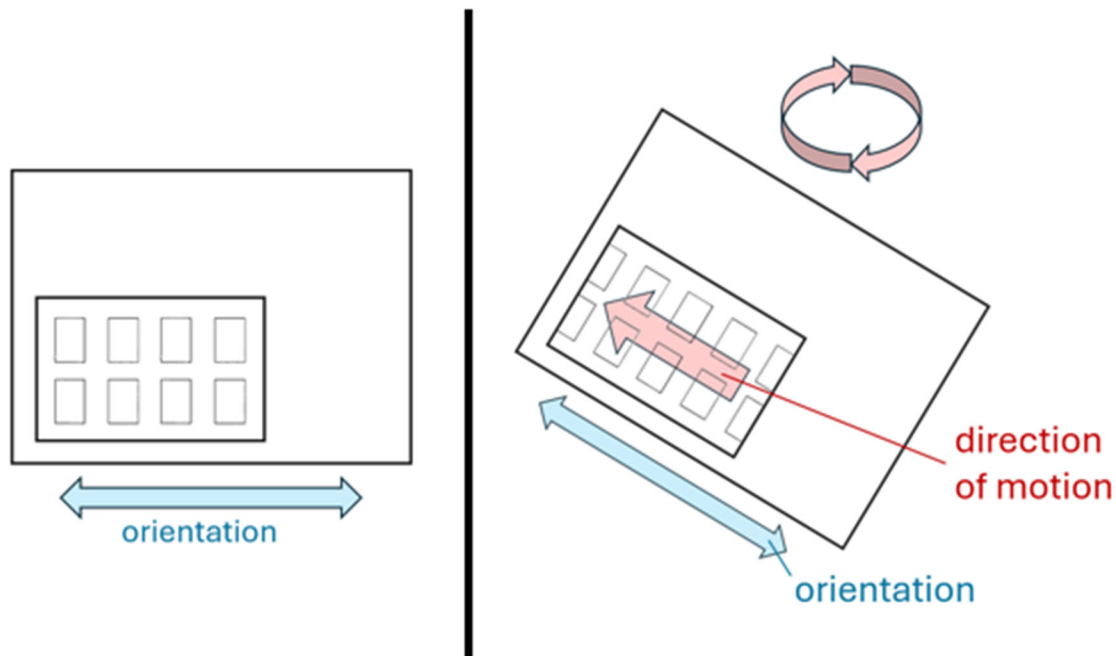


(Dance, Fig. 5B (excerpted; annotations added); Polish, ¶¶171-173.)

“Image Selection Scene” Mapping

In the image selection mode, Dance discloses that “tilting the camera to the right... causes the image to move leftwards in the display device **20**, bringing the rightmost thumbnail view **34** to the top center of the display (indicated at **54**).”

(Dance, 4:60-65; Polish, ¶¶174-179.) Dance’s image selection mode “**cause[s] the graphical element to move**” in a direction that is “**parallel**” or “**perpendicular to the orientation.**”



(Polish, ¶174.) It also would have been obvious to use Dance's zoom input **46** to adjust velocity of scrolling in the image selection mode based on the single image view mode teachings. (Dance, 5:56-67; Polish, ¶¶174-176.) Dance discloses with its single image view mode that the velocity of scrolling is determined by the zoom input **46**, where more zoom indicates a slower velocity to enable finer-grained scrolling when zoomed in. (Dance, 5:56-67.) It thus would have been obvious to use the zoom input **46** setting for the same purpose in image selection mode, such that user could zoom in to the image selection scene and finer-grained scrolling velocity would result. (Polish, ¶175.) A POSITA would have been motivated to implement zoom and zoom-based scrolling velocity in Dance's image selection mode to allow a user to vary the level of detail in which the images can be viewed

in image selection mode. (Polish, ¶176.)

Dance acknowledges that image selection mode can be provided at differing levels of detail (i.e., with larger thumbnails in a one-dimensional array or smaller thumbnails in a two-dimensional array). (Dance, 3:65-4:3; Polish, ¶176.) A POSITA would have been motivated to allow a user to vary the speed with which the images can be navigated. (Dance, 3:65-4:14; Polish, ¶177.) A POSITA would have had more than a reasonable expectation of success and could have implemented the proposed modification of Dance using conventional techniques. (Polish, ¶178.)

Alternatively, claim 1[f] is also obvious over Dance in light of **Kuo** (EX1005) and **Beuk** (EX1006). As explained above, Kuo teaches an operating system with a memory and processor, and that the **“operating system comprises processor-executable instructions.”** (Polish, ¶¶146-149, 169, 180.) Kuo explains that “CPU 344 runs an operating system capable of providing a menu-driven graphical user interface (GUI) and software image processing.” (Kuo, 5:50-53 (emphasis added), Abstract, 5:42-43.) It would have been obvious to incorporate a graphical cursor element into Dance’s graphical user interface in light of Beuk’s tilt controls. (Beuk, 3:32-48; Polish, ¶¶146-149, 169, 180.) Thus, in the combined system, **“the operating system comprises processor-executable instructions that cause the graphical element [e.g., graphical cursor element] to move by the amount of**

displacement in a direction [] parallel or [] perpendicular to the orientation.”

(Polish, ¶¶180, 159, 162.)

Motivation to Combine: As explained above, Dance, Kuo, and Beuk are all analogous references in the same field and similar to the '731 patent, and a POSITA would have had more than a reasonable expectation of success in implementing the combination using conventional techniques. (Polish, ¶¶180, 115-119, 160-165, 169-170, 133-141, 53-59.)

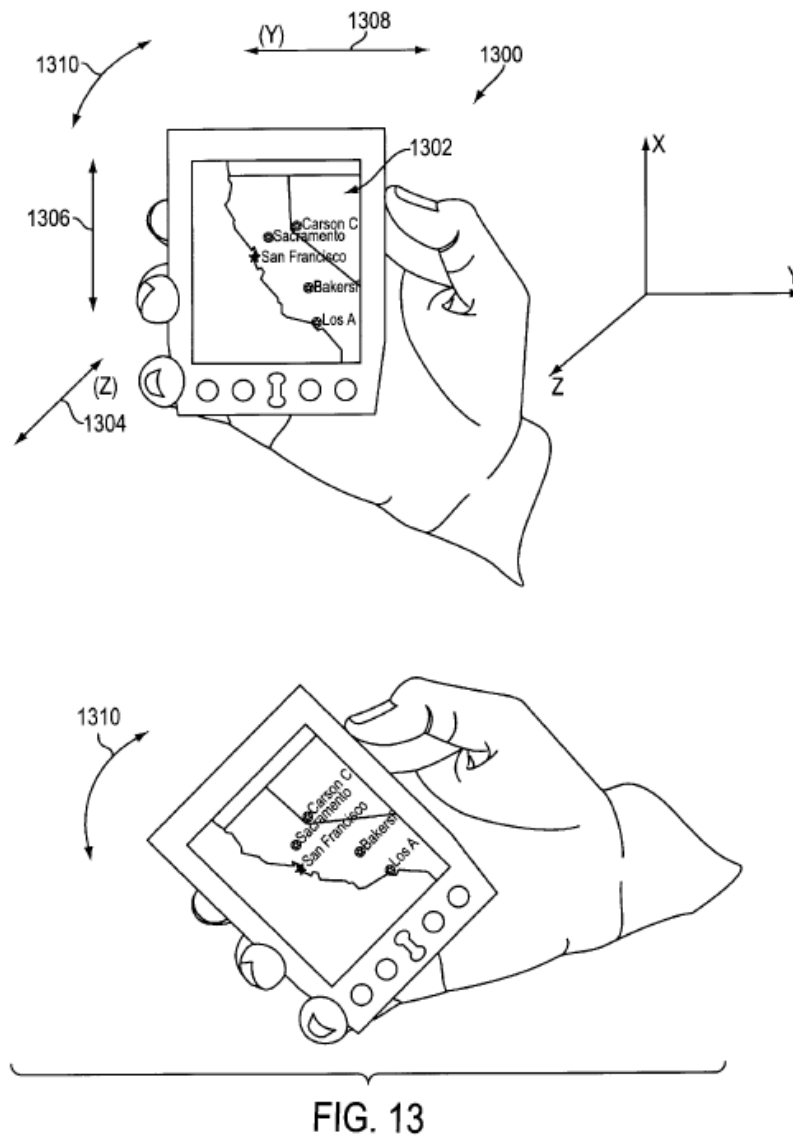
B. Claims 11, 13, and 14 Are Obvious Over Dance in View of Zwern (Ground 3), and Obvious Over Ground 2 Art in View of Zwern (Ground 4)

- 1. Claim 11: “The handheld computing device of claim 1, wherein the processor is configured to detect movement patterns from the directional input signal and wherein the graphical element is further responsive to the detected movement patterns.”**

Claim 11 is obvious based on Dance in view of Zwern. As discussed above for claim 1[d], Dance discloses a “**processor.**” (Polish, ¶¶121-127.) Zwern discloses “**detect[ing] movement patterns from the directional input signal and wherein the graphical element is further responsive to the detected movement patterns.**” Zwern teaches that basic tilting or rotation gestures can be used for magnification, scrolling, and panning actions. (Zwern, 29:17-26 (“hand gestures that correspond in an intuitive manner with ‘special discrete commands’”); Polish, ¶¶183-184, 60-62.) Zwern teaches that a brisk or abrupt motion pattern—such as

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the flick of a wrist (below), shaking, or an abrupt downward motion—can correspond to a discrete command. (Zwern, 29:25-26, Figs. 13-14, 33:1-3, 33:6-8; Polish, ¶183.)



(Zwern, Fig. 13, 29:25-26; Polish, ¶¶181-184.) It would have been obvious to use a specific movement pattern (such as a flick of the wrist) for a discrete command in

applying Zwern's teaching to Dance. (Polish, ¶¶183, 185-189; Dance, 4:36-42.)

Motivation to Combine: Dance and Zwern are both analogous references to the '731 patent. (Polish, ¶¶185, 188.) Like the '731 patent, Zwern relates to controlling handheld devices, including through motion sensing inputs, and addresses the purported need disclosed by the '731 patent to provide a user-friendly handheld device capable of motion sensing. (Zwern, 29:12-31:5; '731, 1:16-20, 3:54-61, 8:4-5, 8:12, 3:54-61; Polish, ¶188.) Dance and Zwern are also analogous references in a similar field. (Polish, ¶185.) Both disclose the use of intuitive actions such as changing the orientation or tilt of a device for controlling magnification or scrolling functions for a user interface. (Dance, 3:32-39, 4:58-65, 5:9-11, 1:13-17, 1:19-20; Zwern, 29:12-31:5; Polish, ¶185.) A POSITA would have been motivated to combine Dance with Zwern to add the discrete commands in Zwern to the system described in Dance to reduce dependency on buttons. (Dance, 2:6-8; Polish, ¶186.) Allowing a user to flick their wrist once a thumbnail is centered in the screen would be an intuitive option for selecting an image that avoids the user having to remember which button controls selection. (Polish, ¶186.) A POSITA would have had more than a reasonable expectation of success and could have implemented the proposed combination using conventional techniques. (Polish, ¶187.) Dance discloses a system with sensors capable of detecting a series of motions (flick of wrist, shaking,

or an abrupt downward motion), and Zwern teaches a method for detecting and assigning intuitive meanings to such motions. (Polish, ¶¶181-189.)

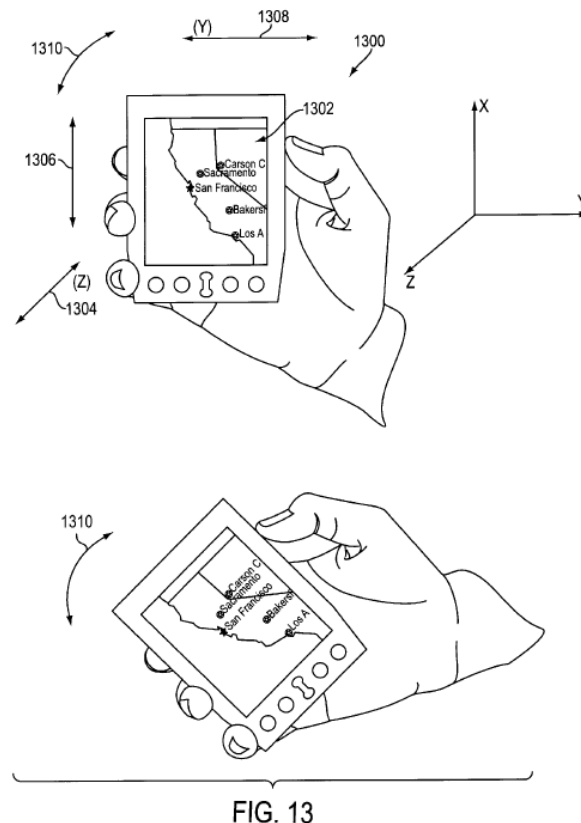
2. Claim 13: “The handheld computing device of claim 11, wherein the graphical element is configured to perform a selection function in response to the detected movement pattern.”

Claim 13 is obvious based on Dance in view of Zwern. It would be obvious for a “**graphical element**” (the thumbnail in Dance) to be configured to “**perform a selection function**” (selecting the image corresponding to the thumbnail for display) “**in response to the detected movement pattern**” (the flick of a wrist in Zwern). (Polish, ¶¶191, 150-157.) As discussed above, Dance teaches the claimed “**graphical element**,” which is “**configured to perform a selection function**,” such as select an image to navigate or zoom. (*Id.*) As discussed for claim 11, using Zwern’s hand gestures for commands in Dance’s image selection mode would have been obvious for the reasons explained above. (Polish, ¶¶183-189, 60-62.) Once a thumbnail in Dance’s camera is positioned in the center of the screen, the thumbnail can be used to select a corresponding image by performing a specific motion pattern (e.g., flick of the wrist). (Zwern, 29:25-26, Figs. 13-14, 33:1-3, 33:6-8, 29:17-26, 30:13-15; Polish, ¶¶191, 184.)

Motivation to Combine: There would have been ample motivations to combine for the same reasons described above. (Polish, ¶¶185-188.)

3. **Claim 14: “The handheld computing device of claim 13, wherein the detected movement pattern is a flick of the wrist.”**

Claim 14 is obvious based on Dance in view of Zwern. Zwern teaches that a brisk or abrupt motion pattern—such as the flick of a wrist (below), shaking, or an abrupt downward motion—can correspond to a command. (Zwern, 29:25-26, Figs. 13-14, 33:1-3, 33:6-8; Polish, ¶¶183-193; *see supra* Section VII.B.1.) In Dance, once a thumbnail is positioned in the center of the screen, the thumbnail can be used to select a corresponding image wherein the “**detected movement pattern is a flick of the wrist.**” (Zwern, 29:25-26, Figs. 13-14, 33:1-3, 33:6-8, 29:19-26; Polish, ¶¶193, 150-157, 60-62.)



(Zwern, Fig. 13; Polish, ¶183.)

Motivation to Combine: The motivations to combine are discussed above.

(Polish, ¶¶185-188.)

C. Claims 2 and 3 are Obvious Over Dance in View of Titus (Ground 5), and Obvious Over Ground 2 Art in View of Titus (Ground 6)

1. Claim 2

Claim 2 depends on claim 1, which is addressed above. (Polish, ¶¶87-180.)

(a) “The handheld computing device of claim 1, wherein the internally-located directional input device comprises” (Claim 2[p])

Dance discloses claim 2[p] for the same reasons as claims 1[p] and 1[b] above.

As explained above, Dance discloses an “**internally-located directional input device**”—i.e., motion sensing device **24**, which can detect orientation of the camera.

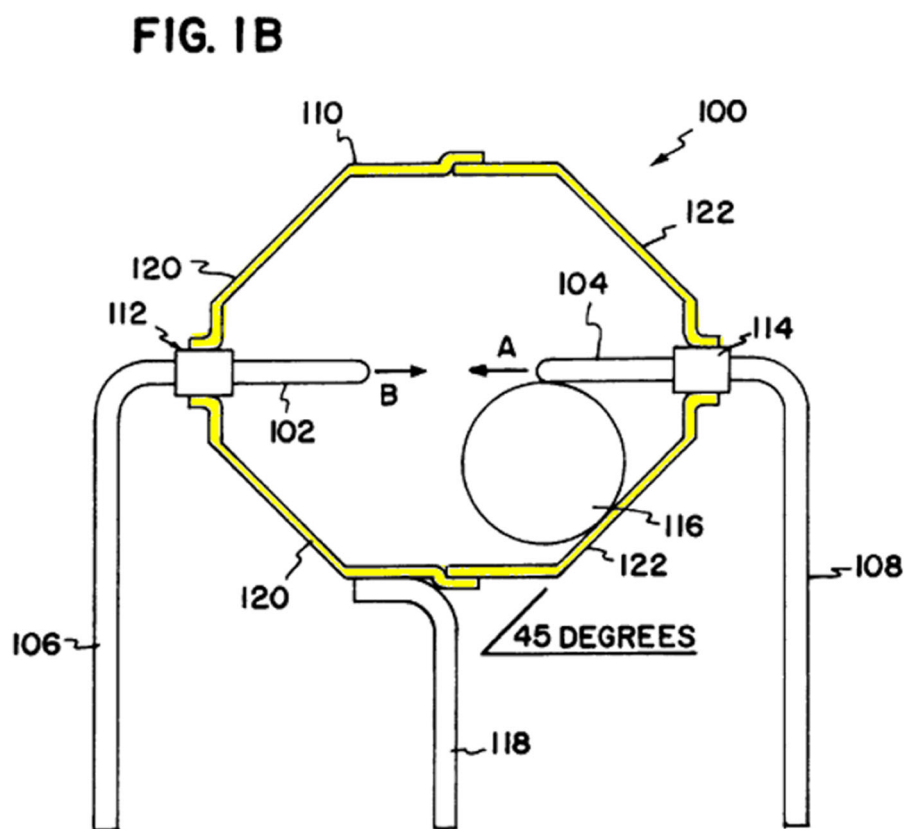
(Dance, Fig. 2; Polish, ¶¶87-90, 93-98, 195-196, 47-52.)

(b) “a primary contact positionally fixed in the handheld computing device” (Claim 2[a])

Claim 2[a] would have been obvious over Dance in light of **Titus** (EX1011).

It would have been obvious to implement Dance’s motion sensing apparatus **24** as a tilt switch array per the disclosures of Titus, because Dance does not disclose implementation details for an orientation sensor, and Titus teaches the details for an orientation sensor. (EX1011; Dance, 6:30-35 (“gyroscope, or use integrated

rotational accelerometers, to estimate the gravity direction” but no details); Polish, ¶¶198, 77-81.) Titus discloses a tilt switch array with a “**primary contact positionally fixed in [a] handheld computing device.**” Titus’s elements **120** and **122** constitute the “**primary contact.**” (Polish, ¶¶204-206.) **Tilt switch array 100** includes frustrated conical portion **120** and second frustrated conical section **122**:

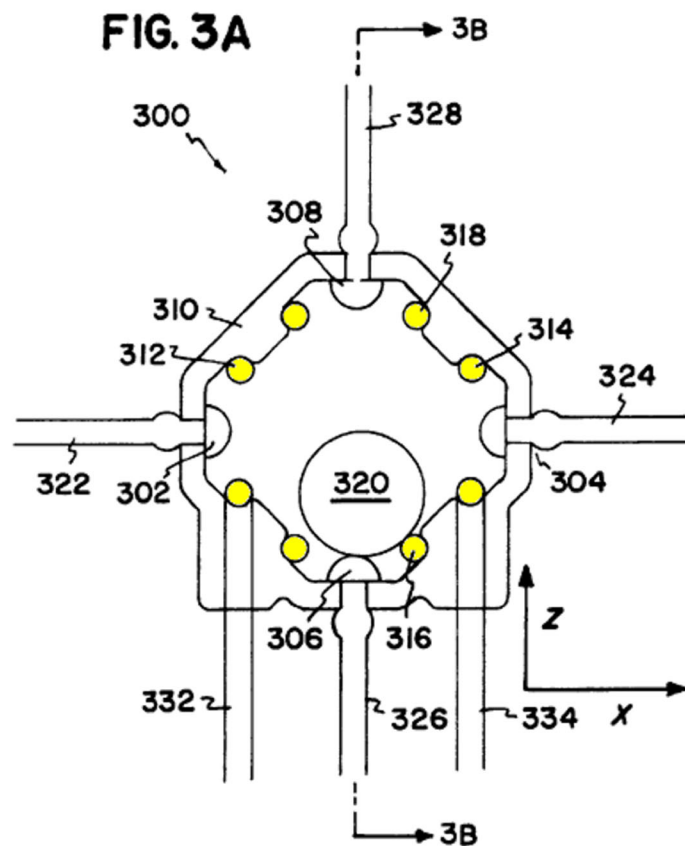


(Titus, Fig. 1B (highlighting added), 3:13-67; Polish, ¶204.) **Elements 120 and 122** are electrical “**contact[s]**”—i.e., they conduct electricity through the ball **116**. (Titus, 3:50-57, 3:12-38 (“housing **110** is electrically conducting”); Polish, ¶204.) Elements **120** and **122** are “**positionally fixed**” as part of the “housing **110**” of the

device. (Titus, 3:39-45, 3:65-67; Polish, ¶204.)

Titus further discloses that its tilt switch designs are situated “**in [a] handheld computing device.**” (Titus, 3:5-11; Polish, ¶205.) The combination would implement Titus’s tilt switch array “**in**” Dance’s camera—as part of its motion sensing device **24**. (Dance, Fig. 2, 3:32-39, 4:58-63, 5:9-11; Polish, ¶205.)

Titus also teaches multiple “**primary contact[s]**” in the device:



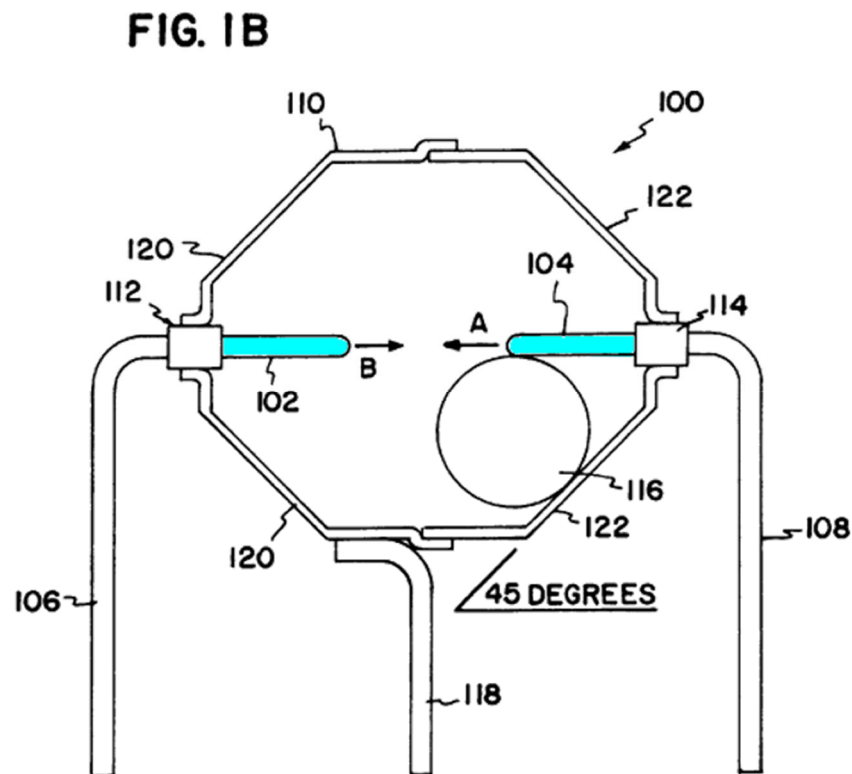
(Titus, Fig. 3A (highlighting added), 4:45-5:6; Polish, ¶206.)

Motivation to Combine: Titus, like Dance, is analogous art to the '731 patent, as it is related to control of a handheld device, including using

motion inputs. (Titus, 1:5-7, 1:13-17, 1:19-20, 1:37-42; '731, 1:16-17, 3:54-61; Polish, ¶203.) Titus is also directed to providing a user-friendly handheld device, capable of sensing motion and orientation. (Titus, 1:32-35; '731, 3:54-61; Polish, ¶203.) Both Titus and Dance relate to tracking orientation or tilt of a handheld device. (Dance, 3:32-39, 4:58-65, 5:9-11, 1:13-17, 1:19-20; Titus, 1:8-11, 1:5-7, 1:37-42; Polish, ¶199.) A POSITA would have been motivated to look to Titus for implementation details on Dance's tilt sensing functionality. (Dance, 6:30-40; Titus, 3:13-67, 4:51-60, Figs. 1B, 3A; Polish, ¶200.) For example, Dance discloses generally that the motion sensing device 24 "could include a gyroscope, or use integrated rotational accelerometers," but it does not provide details for the operation or structure of such devices. (Dance, 6:30-35; Polish, ¶198.) A POSITA would have been further motivated to combine Dance with Titus for a compact implementation of a tilt sensor. (Titus, 1:32-35, 1:45-52, 1:38-42; Polish, ¶201.) Dance discusses the "desire for compactness." (Dance, 1:19-22, 2:43-44, Figs. 1-2.) A POSITA would have had more than a reasonable expectation of success and could have implemented the proposed combination using conventional techniques. (Polish, ¶202.) A POSITA would have recognized Titus's tilt switch arrays as a unit that could be easily integrated into Dance. (Titus, 1:36-42, 1:45-52; Polish, ¶202.)

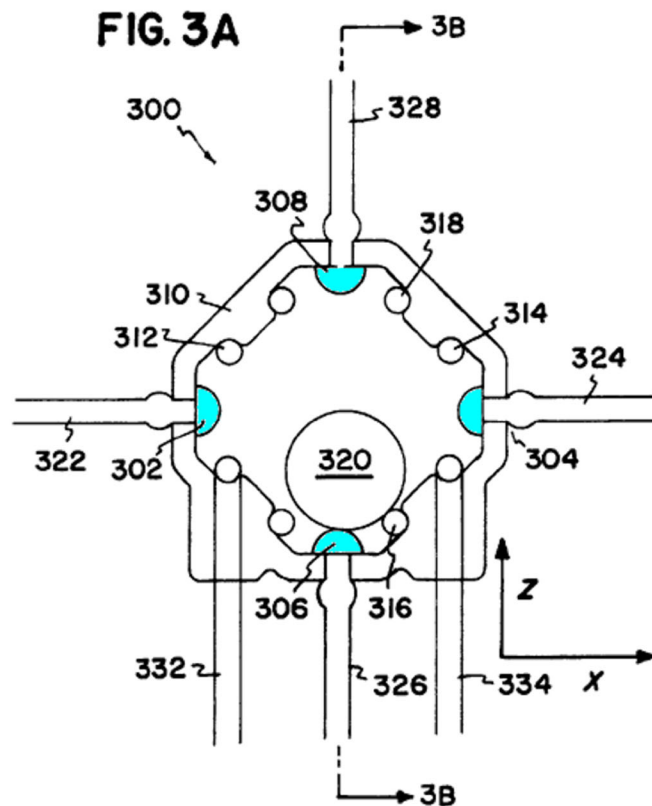
- (c) “at least one directional contact positionally fixed in the handheld computing device and operatively connected to the primary contact;” (Claim 2[b])

Claim 2[b] would have been obvious over Dance in light of Titus. Titus’s tilt switch array includes “**at least one directional contact.**” Specifically, Titus’s tilt switch array includes **electrodes 102 and 104**, each of which constitutes a “**directional contact.**” (Titus, 3:50-59, Fig. 1B; Polish, ¶¶207-212.)



(Titus, Fig. 1B (highlighting added); Polish, ¶207.) The electrode contacted by conductive ball 116 depends on the “**direction[]**” in which the device is oriented. (Titus, 3:50-61; Polish, ¶207.) Electrodes 102 and 104 are “**positionally fixed**” to the housing elements and other electrodes around them. (Titus, 3:32-42, 3:65-67;

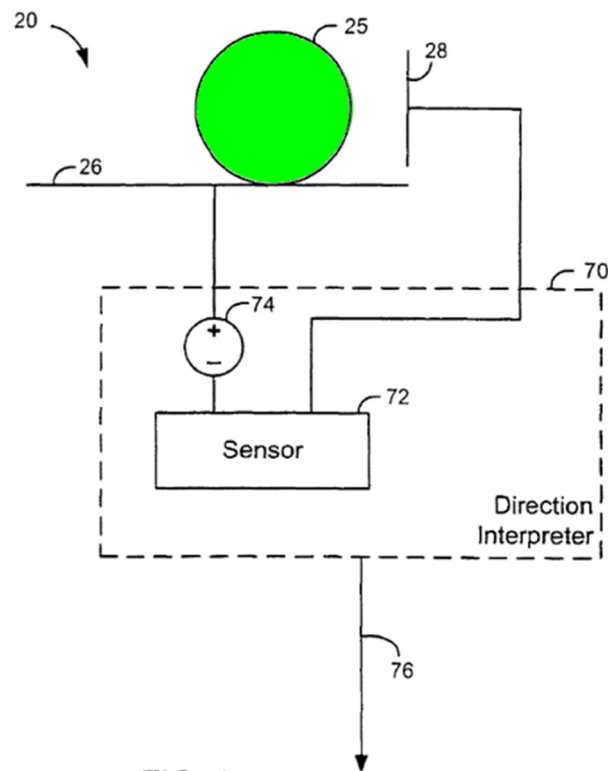
Polish, ¶208.) Electrodes **102** and **104** are “**in [a] handheld computing device.**” (Titus, 3:5-11; Polish, ¶209.) The combination would implement Titus’s tilt switch array “**in**” Dance’s camera. (Dance, Fig. 2 (“**24**”), 3:32-39, 4:58-63, 5:9-11; Polish, ¶209.) Electrodes **102** and **104** are “**operatively connected to the primary contact,**” for example, when the device is in certain orientations such that the ball **116** connects them. (Titus, 3:50-61; Polish, ¶210.) Titus also discloses multiple “**directional contact[s]**”:



(Titus, Fig. 3A (highlighting added), 4:45-5:6; Polish, ¶211.)

- (d) **“circuit closing means, movable on, and in electrical contact with, the primary contact, the circuit closing means moving in response to inclination of the handheld computing device in the direction of any one of the at least one directional contact, between a neutral position in which the primary contact and the any one of the at least one directional contact form an open circuit, and an active position in which the primary contact and the any one of the at least one directional contact form a closed circuit; and”**
(Claim 2[c])

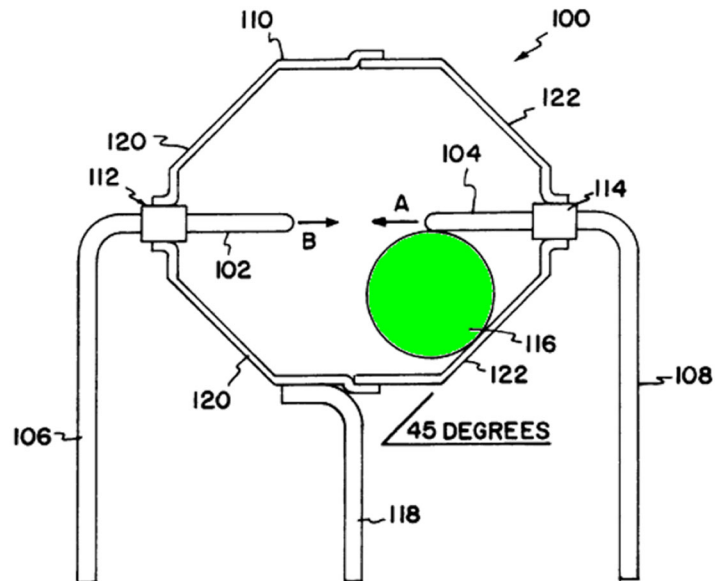
Claim 2[c] would have been obvious over Titus and Dance. As noted above, if **“circuit closing means”** is a means-plus-function limitation, the function is to move in response to inclination of the handheld computing device between a neutral position in which the primary contact and a directional contact form an open circuit, and an active position in which the primary contact and a directional contact form a closed circuit, and the corresponding structure is either a “ball bearing or a mercury contact.” (’731, 4:8-10, 6:12-14, Figs. 1-5; Polish, ¶¶213, 216.) The ’731 patent shows the following “circuit closing means”:



(’731, Fig. 1 (highlighting added); Polish, ¶216.)

As discussed above, it would have been obvious to implement Titus’s tilt switch array in Dance’s camera. (Polish, ¶¶198-205; Dance, Fig. 2; *see supra* claim 2[a].) Titus discloses a “**circuit closing means**”—e.g., **ball 116**:

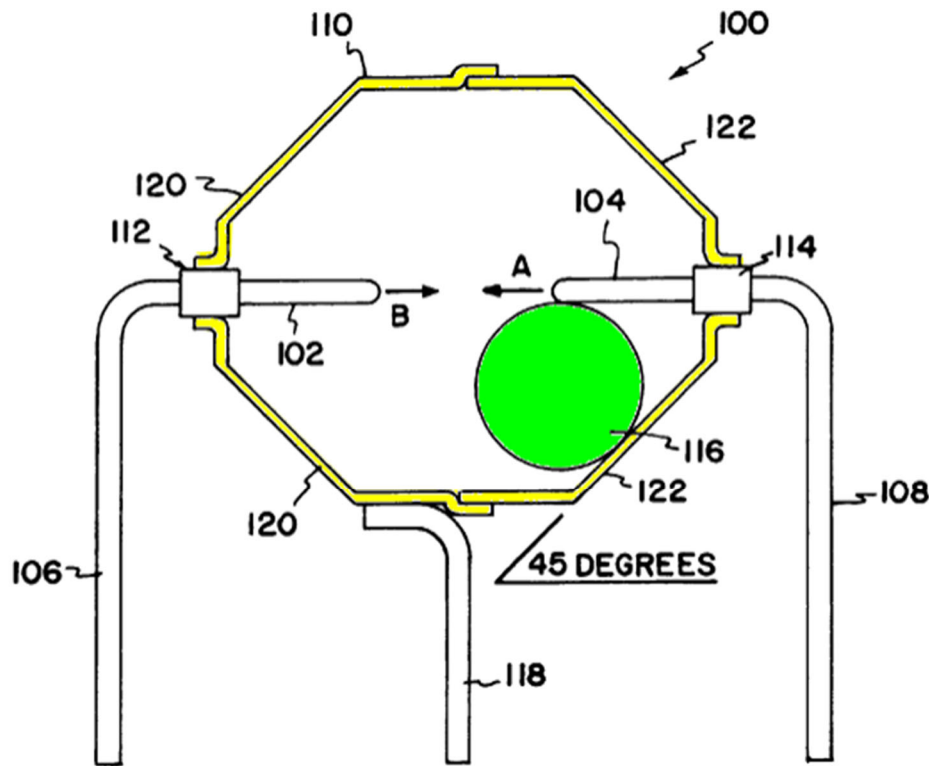
FIG. 1B



(Dance, Fig. 1B (highlighting added); Polish, ¶¶213-216.) **Ball 116** (i.e., the claimed “**circuit closing means**”) is shown in a position where it closes a circuit between electrode **104** and housing element **122**. Titus discloses that “there is an electrically conductive path from the housing electrode **118** to, for example, the second lead **108** through the housing **110**, the ball **116**, and the second electrode **104**, when the ball **116** simultaneously contacts the inner surface of the housing **110** and the electrode **104**, as illustrated.” (Titus, 3:32-38 (emphasis added), Fig. 1B, 3:54-57; Polish, ¶216.)

Titus’s ball **116** is “**movable on, and in electrical contact with, the primary contact.**” (Polish, ¶217.) Ball **116** rolls along the housing components **120** and **122** (the “**primary contact**”):

FIG. 1B



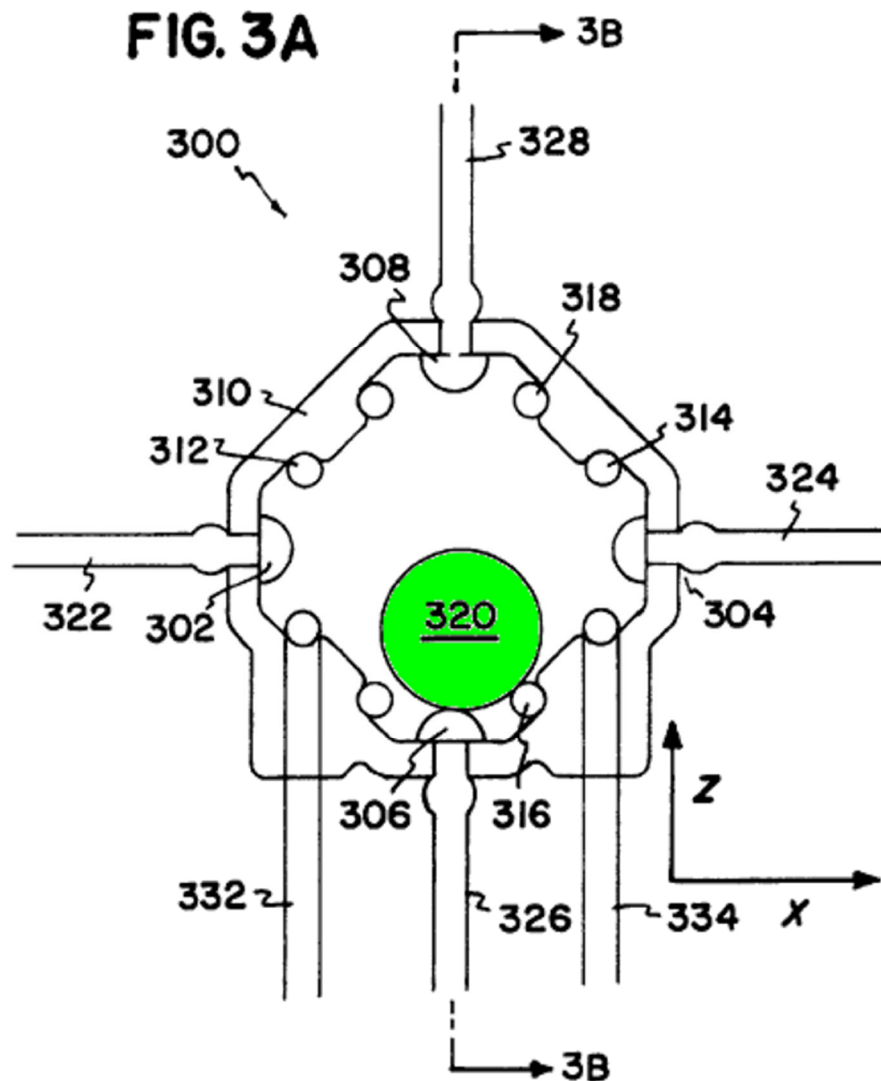
(Titus, Fig. 1B (highlighting added); Polish, ¶217.) Titus also discloses that when “neither the first electrode **102** nor the second electrode **104** is pointing within $\pm 45^\circ$ of an upward direction, there is no stable position for the ball **116** to contact either electrode **102** or **104**.” (Titus, 3:62-67; Polish, ¶217.) Accordingly, Titus’s ball **116** is “**movable on**” the housing. (Polish, ¶217.) Titus’s ball **116** is “**in electrical contact with**” the housing—i.e., ball **116** can create an “electrically conductive path” with the housing. (Titus, 3:32-37, 3:50-61; Polish, ¶¶217-218.)

Titus’s ball **116** “mov[es] in response to inclination of the handheld

computing device in the direction of any one of the at least one directional contact.” For example, Figure 1B shows ball **116** after it has “**mov[ed]**” **in response to inclination of the handheld computing device in the direction of** electrode **104**. (Titus, 3:32-38; Polish, ¶¶217-219.) Depending on the tilt of the device, ball **116** can move toward and complete a circuit with either electrode **102** or electrode **104**. (Titus, 3:50-59; Polish, ¶218.)

Titus further discloses that its ball **116** moves “**between a neutral position in which the primary contact and the any one of the at least one directional contact form an open circuit, and an active position in which the primary contact and the any one of the at least one directional contact form a closed circuit.**” Titus discloses that ball **116** can be in a “**neutral position,**” such that “there is no stable position for the ball **116** to contact either electrode **102** or **104**” and “neither the first or second tilt switches are closed[.]” (Titus, 3:62-67; Polish, ¶¶219, 217.) Titus discloses that ball **116** can be in an “**active position,**” such that it forms a closed circuit between the housing and either of electrodes **102** or **104**. (Titus, 3:50-59, 3:32-38; Polish, ¶219.)

Figure 3A teaches another “**circuit closing means**”—e.g., ball **320**:



(Titus, Fig. 3A (highlighting added), 4:45-5:6; Polish, ¶220.)

- (e) “a direction interpreter, operatively connected to the primary contact and the at least one directional contact, for generating the directional input signal.”
(Claim 2[d])

Claim 2[d] would have been obvious over Titus in view of Dance.

Titus discloses that its tilt switch array can include a “**direction interpreter.**”

(Polish, ¶¶221-222.) Titus discloses that its tilt switch array can be connected to an “external circuit,” which “permits the user to determine which particular tilt switch... is closed by the ball[.]” (Titus, 4:57-60; Polish, ¶222.) As explained above, Dance is interpreting the direction of the device. (Polish, ¶¶50, 94-96, 98, 103-104, 171-174.) Titus’s “external circuit” is **“operatively connected to the primary contact and the at least one directional contact.”** (Polish, ¶222.) In Figure 3A, “[e]ach ring **312, 314, 316, and 318** has an associated lead **332, 334, 336, and 338** extending through the housing **310** for connection to the external circuit.” (Titus, 4:55-57; Polish, ¶222.) It would have been obvious to use the **“direction interpreter”** disclosed by Titus in the context of Dance to **“generat[e] the directional input signal.”** (Polish, ¶222.) Titus discloses that the “external circuit” can be used to “determine which particular tilt switch... is closed by the ball[.]”—which indicates the tilt direction. (Titus, 4:57-60, 5:16-19 (“external circuit for determining the orientation of the tilt switch array **400**”); Polish, ¶222.) Titus’s embodiments also disclose using a “controller” for determining the orientation of a tilt switch array. (Titus, 6:2-5; Polish, ¶222.)

2. Claim 3: “The handheld computing device of claim 2, wherein the directional input signal is uniquely associated with the direction of the inclination.”

Claim 3 would have been obvious over Dance in light of Titus. Titus’s Figure 1B leads to one output signal when the device is tilted in one direction (e.g.,

a signal along lead **106** when it is tilted to the left and the ball completes a circuit between the housing **110** and the electrode **102**). (Titus, 3:54-61, Fig. 1B; Polish, ¶¶223-227.) Figure 1B circuit provides a different output signal when the device is tilted in the opposite direction (e.g., a signal along lead **108** when it is tilted to the right and the ball completes a circuit between the housing **110** and the electrode **104**). (Titus, 3:45-53, Fig. 1B; Polish, ¶225.) Titus discloses that an external circuit or controller can be used to determine the particular tilt based on the information from the tilt switch array. (Titus, 4:57-60, 6:2-5, 5:16-19; Polish, ¶225.) Accordingly, **“the directional input signal is uniquely associated with the direction of the inclination.”** (Polish, ¶225.)

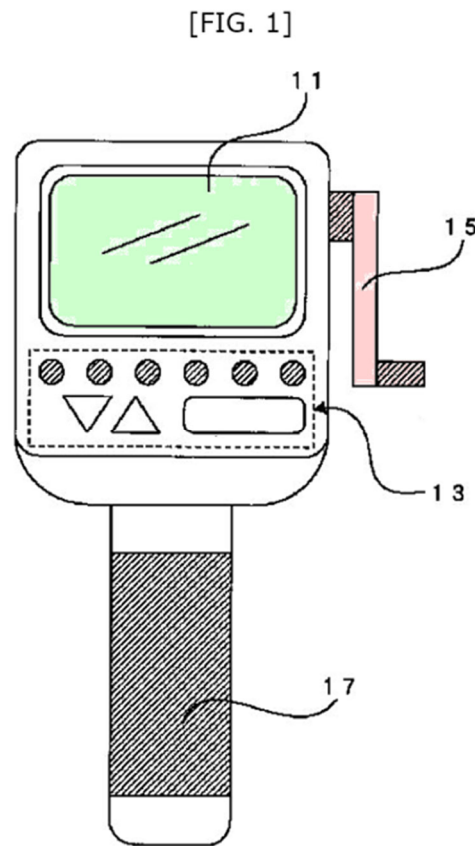
Similarly, Titus’s Figure 3A leads to different output signals depending on the contacts between which the circuit is completed based on the position of the ball. (Titus, 4:51-60, Fig. 3A; Polish, ¶226.) The external circuit then “permits the user to determine which particular tilt switch, i.e. electrode/ring combination in the tilt switch array, is closed by the ball **320**.” (Titus, 4:57-60; Polish, ¶226.) Thus, Titus indicates that the external circuit provides a **“directional input signal”** that is **“uniquely associated with the direction of the inclination.”** (Polish, ¶¶226-227.)

D. Claims 1-3, 11, and 13-14 are Obvious Over Dornbusch in view of Uragami (Ground 7), and Obvious Over Dornbusch in View of Uragami, Nakano, and Moritome (Ground 8)

1. Claim 1

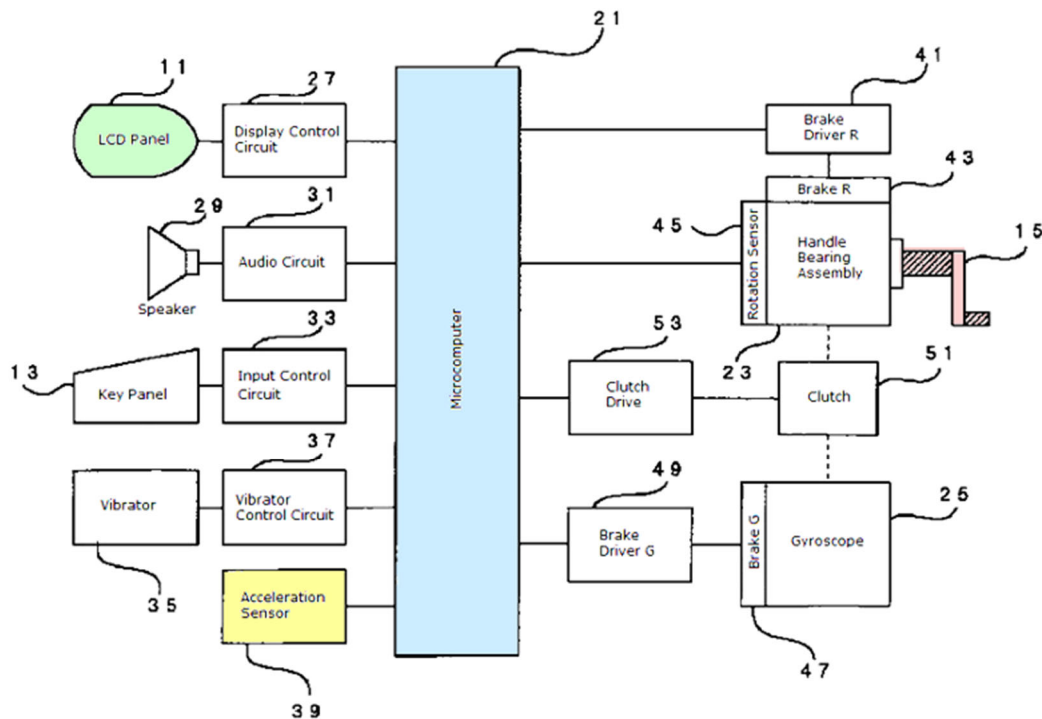
**(a) “A handheld computing device, comprising: a display”
(Claim 1[p] & 1[a])**

Claims 1[p]-1[a] are rendered obvious in view of Dornbusch (EX1008) and Uragami (EX1009/EX1015). Dornbusch discloses a handheld fishing controller used with a “**display**.” (Dornbusch, Fig. 1, 3:66-4:23 (“display”), 4:1-7, Abstract; Polish, ¶¶229-241, 63-72.) Dornbusch does not explicitly depict the “**display**” on the fishing controller, but such a display would have been obvious in view of Uragami, which is a handheld fishing controller with a display on the controller. (EX1009; Polish, ¶¶230-231.) It would have been obvious to combine the elements in Dornbusch’s Figure 1 (e.g., display screen **6**, game device **2**, and controller **3**) into a single device, based on Uragami. (Polish, ¶¶231-241.) Uragami discloses a “fishing simulation game device” with an LCD panel **11** display and reel handle **15**:



(Uragami, Fig. 1 (highlighting added), Abstract, [0002]; Polish, ¶231.) Uragami's fishing controller has a microcomputer 21, LCD panel 11, acceleration sensor 39, and reel handle 15:

[FIG. 2]



(Uragami, Fig. 2 (highlighting added), [0013]-[0014]; Polish, ¶231.) Dornbusch in view of Uragami renders obvious “[a] **handheld computing device, comprising: a display.**”

Motivation to Combine: Dornbusch and Uragami are analogous art to the ’731 patent as both relate to control of a handheld device, including using motion sensing inputs, and providing more realistic motion sensing and control. (Dornbusch, 1:13-16, 2:26-30, 2:53-65, 1:7-10; Uragami, Fig. 1, [0021], [0006]; ’731, 1:16-20, 3:54-61, 3:40-43; Polish, ¶¶241, 232.) Dornbusch and Uragami are analogous fishing controllers. (Polish, ¶232.) A POSITA would have been

motivated to implement Dornbusch's fishing controller as a self-contained system to increase realism. (Polish, ¶¶232-237; Uragami, [0006], Title, Abstract, [0007]-[0008], [0016], [0001], [0021], [0026]-[0028].) Dornbusch emphasizes the importance of realism and the experience of real-world fishing. (Dornbusch, 1:13-16, 1:7-10, 1:28-30, 1:40-42, 2:26-30, 1:64-2:25, 2:53-65, 4:25-32, 5:25-30, 11:24-30; Polish, ¶235.) A POSITA would have been motivated to implement Dornbusch's fishing controller as a self-contained handheld device to simplify Dornbusch's system. (Polish, ¶237.) A POSITA would have had a reasonable expectation of success and could have implemented the proposed combination using conventional techniques. (Polish, ¶¶238-240; '731, 1:24-31; EX1016, 1:45-50, Figs. 1-3, 1:56-62, 2:49-3:21, 2:32-37, 4:9-13.) For instance, the Radica BASS FISHIN' game had a self-contained display. (EX1029, p.001; EX1016, 1:45-50; Polish, ¶240.)

(b) “an internally located directional input device providing a directional input signal, the directional input signal corresponding to an axis of inclination of the handheld computing device and indicating an orientation” (Claim 1[b])

Dornbusch discloses claim 1[b]. Dornbusch discloses “**an internally located directional input device.**” Dornbusch teaches a fishing controller containing “position sensing switches, such as mercury switches” that are “inside the reel.” (Dornbusch, 3:10-13, 4:60-62, 4:62-65; Polish, ¶¶242-245.)

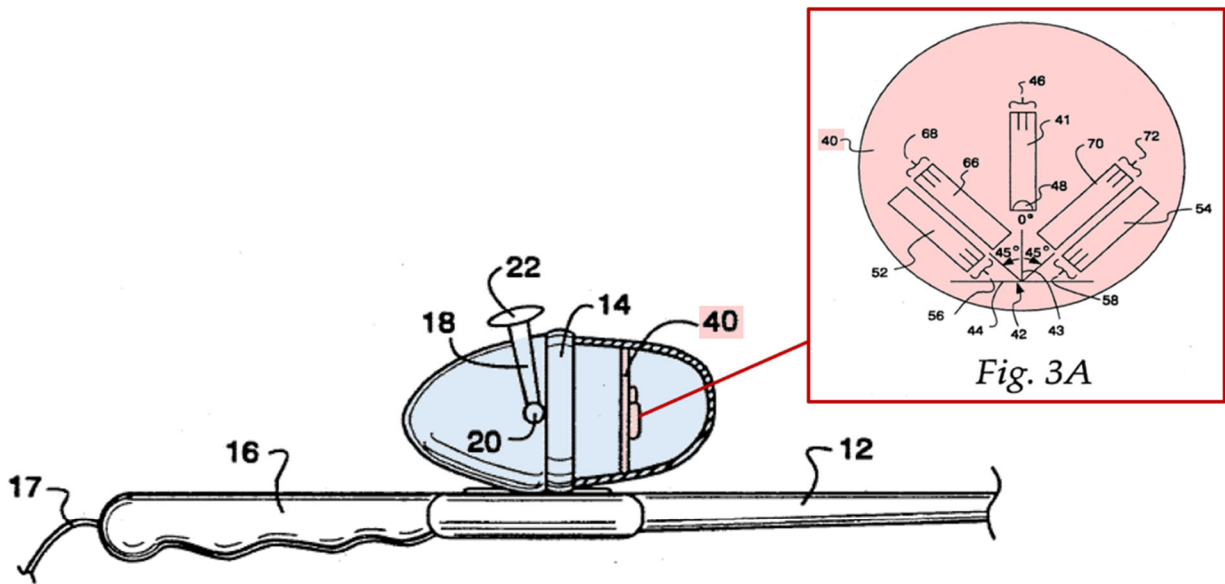
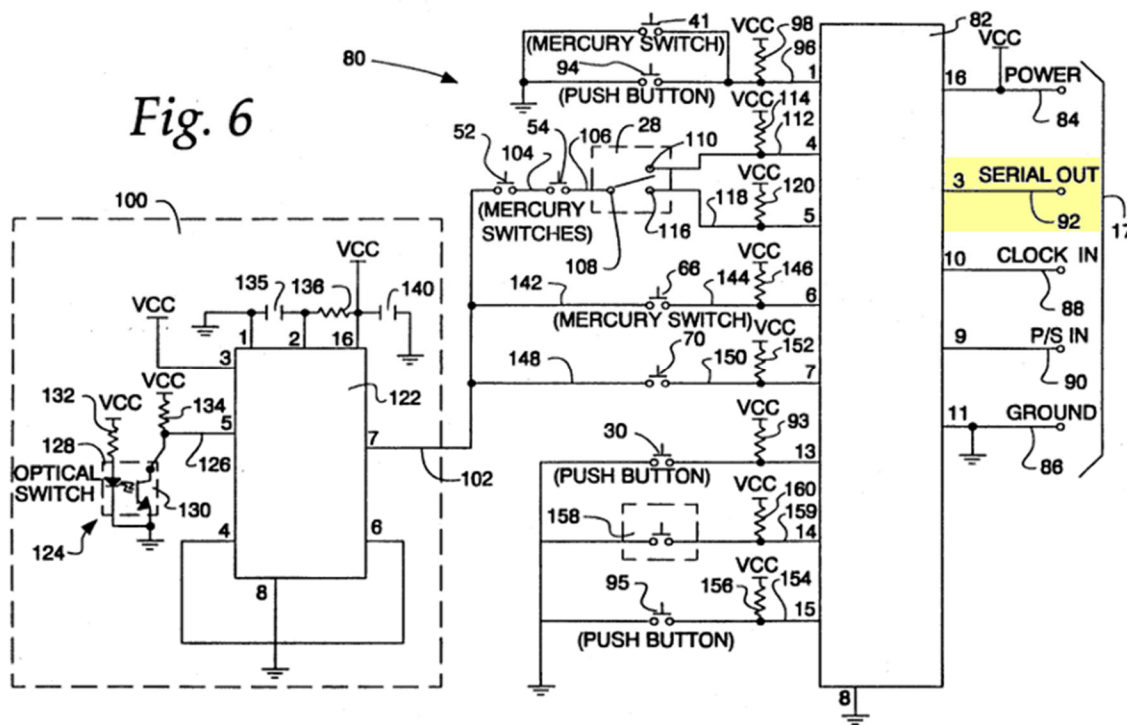


Fig. 3B

(Dornbusch, Figs. 3A, 3B (annotations added); Polish, ¶245.) The “**internally located**” switches “can sense the position of the fishing rod as the rod is moved in various directions by the game player.” (Dornbusch, 3:16-20 (emphasis added), Fig. 1; Polish, ¶245.) For example, the switches can determine whether “the rod is in the upright position.” (Dornbusch, 8:10-24, 9:22-24, 3:13-20, Abstract, Fig. 4; Polish, ¶¶243-244.) The switches (along with their circuitry) are a “**directional input device**,” since they allow a user to provide a direction indicated by the orientation of the device. (Polish, ¶246; ’731, 5:59-6:21 (“mercury switch that is used to provide a directional input”), 4:8-10, 10:32-33.) Dornbusch’s switches “**provid[e] a directional input signal**,” because the “switches are coupled to

electronic circuitry which recognizes the opening and closing of the mercury switches and generates signals for controlling the operation of the game being played.” (Dornbusch, 6:28-32 (emphasis added), 7:12-15, 6:42-48, 7:5-11, 9:36-39, 3:20-32; Polish, ¶¶243-247.) The signal output is a “**directional input signal,**” since it is a signal that carries directional information input through the system’s switches:



(Dornbusch, Fig. 6 (highlighting added); Polish, ¶247.) The signal output “correspond[s] to an axis of inclination of the handheld computing device.” Dornbusch discloses that the signals from its mercury switches, which are reflected in the interface circuitry output signal, correspond to the axis of inclination of the

FIG. 1 is a schematic diagram of a circular device 40. The device features a central vertical component 46 and two diagonal components 68 and 72. The central component 46 is labeled with 41 and 48, and has a 0° angle indicated. The diagonal components 68 and 72 are labeled with 66 and 70, and have 45° angles indicated. A horizontal line 52 is shown at the bottom, with a yellow highlight 54. Other labels include 42, 43, 44, 56, and 58.

(Dornbusch, Fig. 3A (highlighting added), 5:5-11; Polish, ¶¶248-249.) Line 44 is a “horizontal” reference line “corresponding to the position of rod 12 and reel 14 when held in a horizontal position.” (Dornbusch, 5:5-11; Polish, ¶249.) Dornbusch

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discloses different switches opening and closing depending on the orientation of the controller axis of inclination with respect to the horizontal plane (e.g., depending on gravity). (Dornbusch, 6:4-34, Figs. 4, 5, 5:21-33, 5:34-6:3, 6:25-34, 7:5-15, 6:42-48; Polish, ¶¶249-252.) The output signal “**indicat[es] an orientation.**” (Dornbusch, 7:5-15, 6:25-34, 6:42-48, 8:10-24; Polish, ¶¶251-252.) Dornbusch discloses that the signals from the mercury switches—and therefore the output signal from the interface circuitry—change based on the orientation of the fishing controller, as shown in Figures 4 and 5:

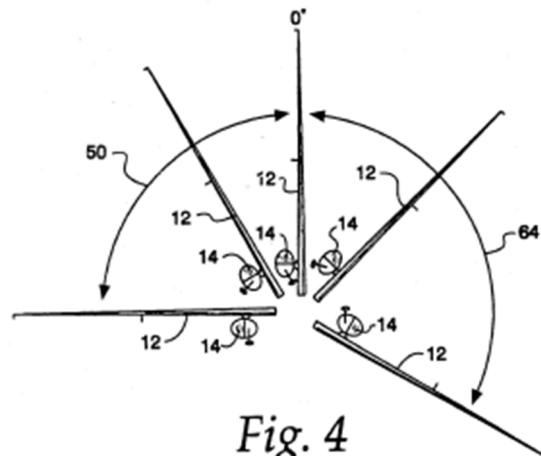


Fig. 4

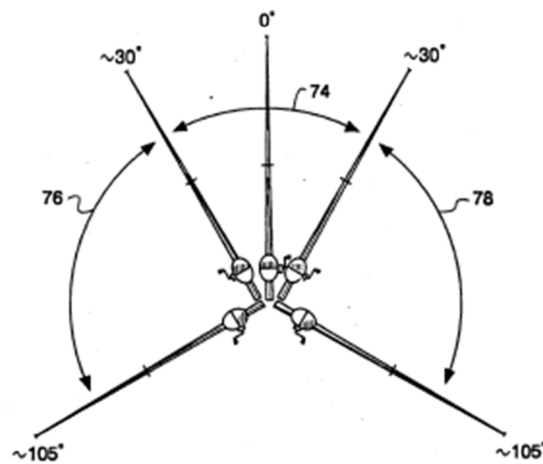


Fig. 5

(Dornbusch, Figs. 4, 5, 5:21-6:24; Polish, ¶251.) The output signal from Dornbusch's circuitry indicates the orientation of the fishing rod controller—i.e., the orientation of the fishing controller's axis with respect to the horizontal plane. (Polish, ¶252.)

- (c) **“a second directional input device providing a second directional input signal, the second directional input signal indicating an amount of displacement”**
(Claim 1[c])

Dornbusch discloses claim 1[c]. Dornbusch discloses that its fishing

controller includes a crank input that the user can rotate to control gameplay. (Dornbusch, 8:10-9:68, 10:27-40 (“To work the lure to the left, the rod and reel are tilted to the left to close the fourth mercury switch **66** and at the same time turning the crank **18**.”), 7:48-58, 4:4-47, 3:24-35, 2:47-52; Polish, ¶¶253-256.) The crank input is highlighted below:

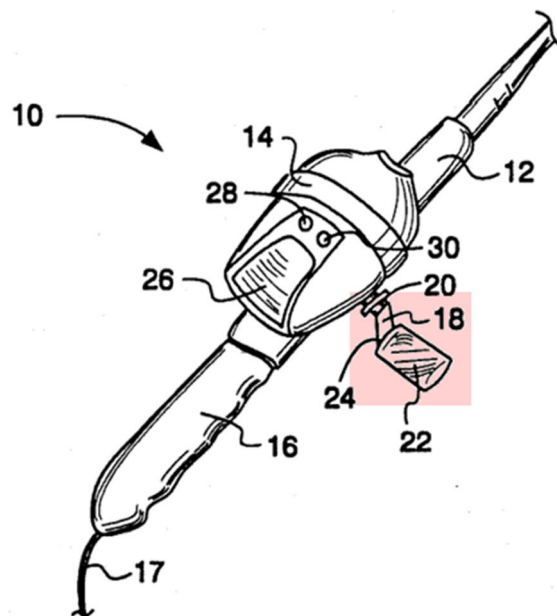


Fig. 2

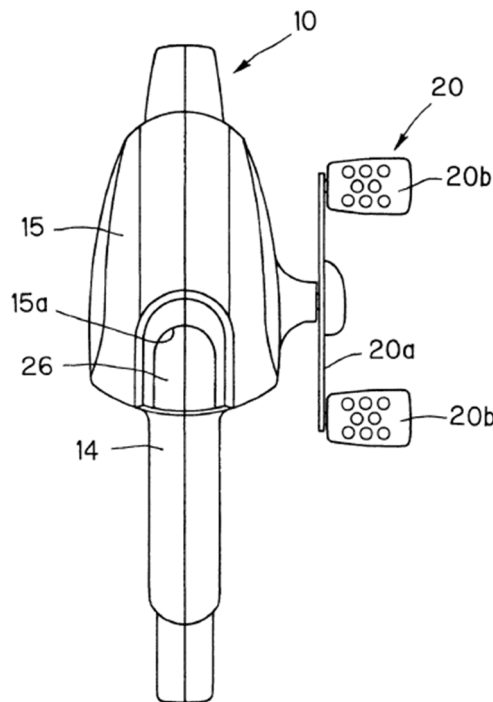
(Dornbusch, Fig. 2 (highlighting added); Polish, ¶254.)

Dornbusch’s crank input is a “**second directional input device**.” The crank input is an “**input device**,” since it allows a user to provide inputs into the game system, and it is “**directional**” in that it measures the user’s manipulation of the

device in a particular direction and is used by Dornbusch's game device to move a graphical element in a direction. (Dornbusch, 8:10-9:68, 10:27-40, 2:47-52; Polish, ¶¶254-256; '731 patent, 10:48-51, 1:43-46, 2:21-37, 3:12-15.)

Alternatively, claim 1[c] is also obvious over Dornbusch and Uragami in view of **Moritome** (EX1010). Moritome discloses an analogous fishing game controller with a handle **20** that can be rotated in either of two directions.

FIG. 3



(Moritome, Fig. 3, 7:45-50, 7:19-37, Fig. 4; Polish, ¶¶257-266, 73-76.)

The combined system would have a crank that could be rotated in either direction and would provide a signal indicating the direction of rotation. (Polish, ¶¶258, 257.)

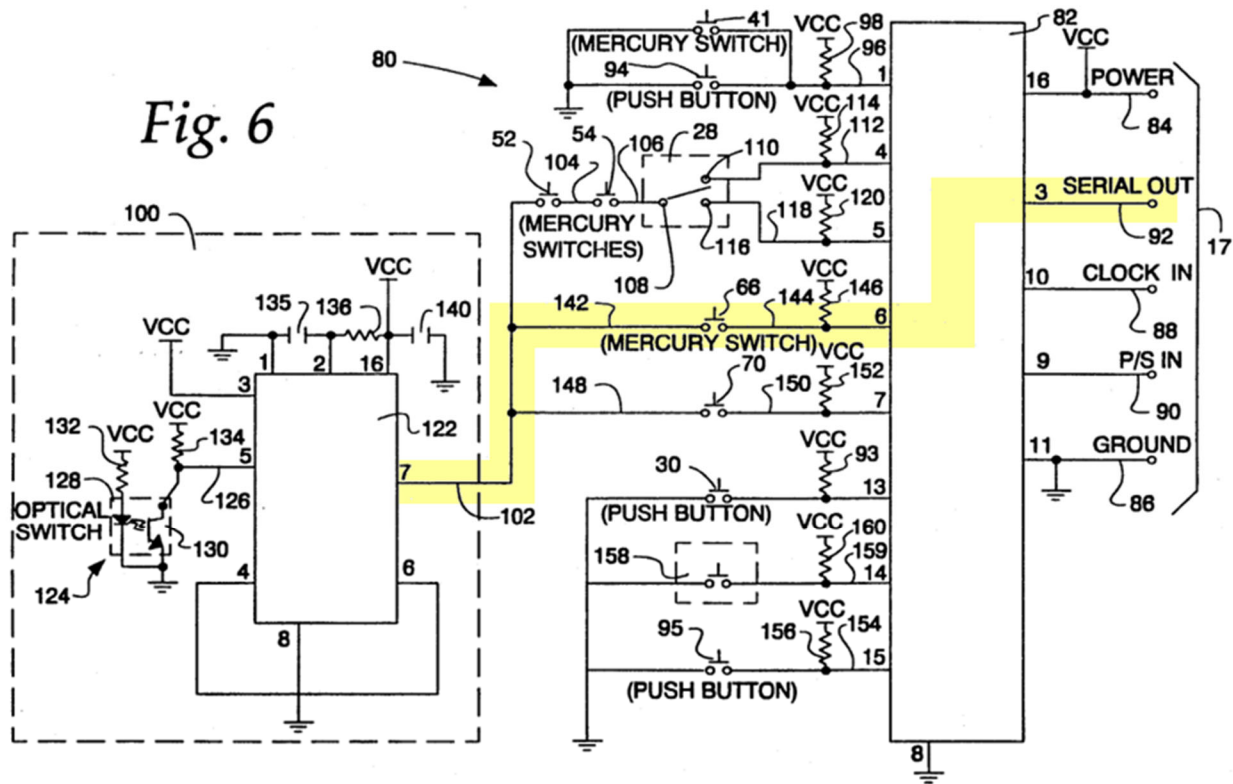
Dornbusch's game could then use the directional signals for controlling gameplay—

causing an object to move in one direction when the crank is rotated one way, and causing the object to move in the opposite direction when the crank is rotated the other way. (Polish, ¶258.)

Motivation to Combine: Dornbusch, Uragami, and Moritome are analogous references to the '731 patent. (Polish, ¶265.) Moritome is analogous to the '731 patent as it relates to motion sensing inputs to an electronic device. (Moritome, Figs. 2-3; *id.*, 1:11-13, 7:19-52, 2:5-7; '731, 1:16-20, 3:54-61.) Dornbusch, Uragami, and Moritome are analogous fishing controller disclosures, and are designed to simulate a real-world fishing experience with a crank. (Polish, ¶¶259-262, 265.) A POSITA would have been motivated to combine Dornbusch, Uragami, and Moritome to provide a more realistic fishing experience—a crank that could be rotated in either of two directions would better simulate real-world fishing. (Polish, ¶¶260-262; Dornbusch, 1:13-16, 1:7-10 (“game controller responds to actual motion which mimics real motion typically occurring during the performance of a corresponding real event being simulated by the game play”), 1:28-30, 1:40-42, 2:26-30, 1:64-2:25, 2:53-65, 5:25-30, 11:24-30, 4:25-32; Moritome, 1:11-13, 2:5-7, 2:10-12, 1:48-52.) A POSITA would have been motivated to implement a bidirectional crank in Dornbusch’s controller to simplify Dornbusch’s system. (Dornbusch, 7:53-58, 7:63-8:9, 8:15-24, Figs. 2, 6; Polish, ¶263.) Implementing the

combination would have simply involved adjusting the optical sensor arrangement per Moritome's disclosures. (Moritome, 8:48-65, 7:19-37, Fig. 4; Polish, ¶264.) A POSITA would have had a reasonable expectation of success. (*Id.*) Indeed, the crank of Dornbusch and Moritome as a “**directional input device**” is consistent with the '731 patent. ('731 patent, 10:48-51, 1:29-33, 1:43-46, 2:21-37, 3:12-15.)

The crank input—either under Dornbusch or the Dornbusch-Moritome combination—provides a “**second directional input signal**,” because the crank input provides a signal to Dornbusch's interface circuitry, which is then converted into a signal usable by the device. (Polish, ¶¶267-270.) Pulses from the crank input are output to Dornbusch's circuitry (pins **4, 5, 6**, or **7**), which then “converts this signal into one recognizable by the device received over the serial out conductor **92** at pin **3**.” (Dornbusch, 9:35-39, 18:19-24, 9:50-54, 9:64-67, 8:48-65, 8:60-62; Polish, ¶267.)



(Dornbusch, Fig. 6 (highlighting added); Polish, ¶267.) Dornbusch discloses a “**second directional input signal indicating an amount of displacement.**” (Dornbusch, 8:57-62; Polish, ¶268.) A high state for pins **6** or **7** of the interface circuitry causes a graphical element like a boat or a lure to “move to the left” or “move to the right.” (Dornbusch, 9:40-68, 10:28-38.) Dornbusch also discloses that when the crank is rotated on a menu screen, “[e]ach time a pulse is generated by the pulse circuit **100** in response to the crank, the cursor moves up one selection in the menu.” (Dornbusch, 8:10-24 (emphasis added).) This moving up of “one selection” is an “**amount of displacement**” (i.e., rather than moving two selections up, etc.). (Polish, ¶¶268-270.) Dornbusch’s circuitry thus provides both a “**directional input**

signal” and a **“second directional input signal.”** (Dornbusch, 6:46-48, 6:63-7:15, 9:40-54; Polish, ¶¶267-270, 254, 243-245.)

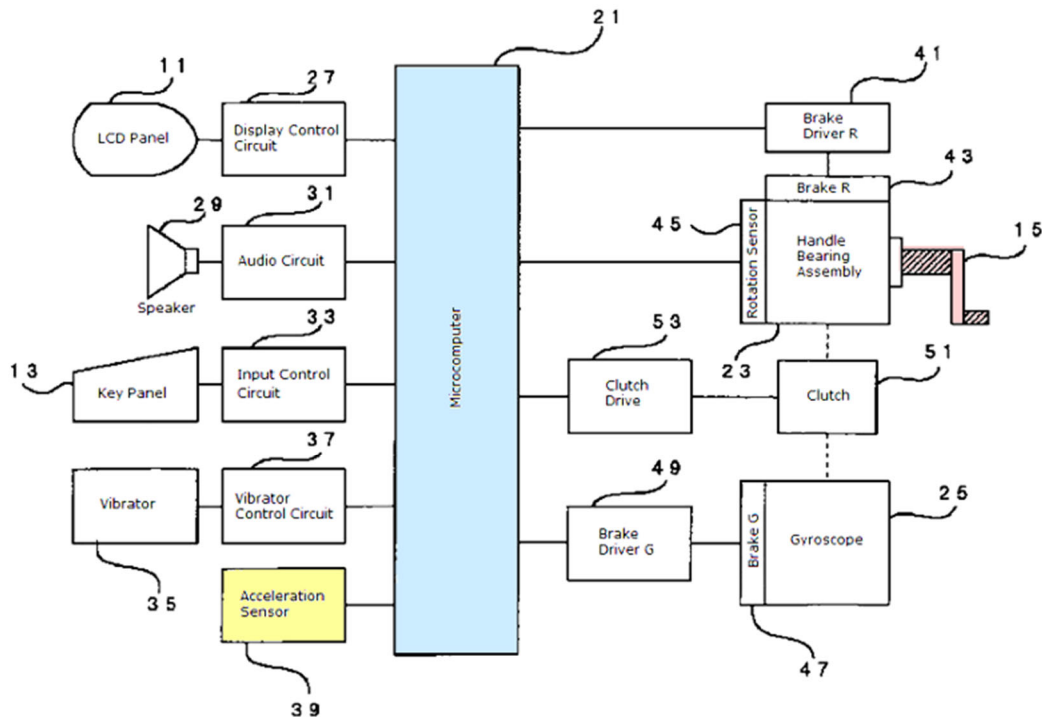
(d) **“a processor coupled to the internally located directional input device and the second directional input device and operable to receive and process the directional input signal in conjunction with the second directional input signal; and”** (Claim 1[d])

Claim 1[d] is disclosed by or obvious over Dornbusch. Dornbusch’s device has “a microprocessor” (**“processor”**). (Dornbusch, 1:19-23 (“microprocessor”), Fig. 1, 3:66-4:11 (6:39-42); Polish, ¶¶271-281.) The device (including the processor) is **“coupled to the internally located directional input device and the second directional input device”** (which are contained in the controller **3** as discussed above for claims 1[b] and 1[c]). (Dornbusch, Fig. 1, 3:66-4:11; Polish, ¶¶242-270.) Dornbusch additionally discloses that the device (including the processor) is **“operable to receive and process the directional input signal in conjunction with the second directional input signal.”** (Polish, ¶¶271-281.) As discussed above for claims 1[b] and 1[c], Dornbusch discloses that the output signal from its interface circuitry (which contains both the first **“directional input signal”** and the **“second directional input signal”**) is **“receive[d]”** by the device. (Polish, ¶¶242-270.) Dornbusch discloses that the interface circuitry is coupled to the device through conductor **92**, which **“carries a control signal to the game device which controls the play of the game.”** (Dornbusch, 7:5-11, 9:36-39, 6:50-53, 7:12-15;

Polish, ¶274.) Dornbusch discloses that the game device “**process[es]**” the directional input signals. (Dornbusch, 7:5-11 (“The conductor **92** carries a control signal to the game device which controls the play of the game.”), 9:30-32, 9:36-39, 9:52-54, 9:66-68, 4:1-4, 10:12-14, 6:46-48, 7:1-5, 7:8-15; Polish, ¶¶275-277.)

Alternatively, Dornbusch in view of Uragami (EX1009) renders claim 1[d] obvious. (Polish, ¶¶278-280, 229-241; *see also supra* analysis for claims 1[p]-1[a].) Under the combination, the player controls the game on the single handheld device display. (*Id.*) Uragami teaches a “**processor coupled to the internally located directional input device.**” Uragami’s microcomputer **21** contains a “CPU” (“**processor**”) in the controller:

[FIG. 2]



(Uragami, Fig. 2 (highlighting added), [0012]-[0014]; Polish, ¶¶278-280.)

Microcomputer 21 receives and processes signals from both its acceleration sensor 39, which tracks the motion of the device, and the circuitry associated with the reel handle 15. (Uragami, [0013]-[0014]; Polish, ¶279.)

As discussed above, it would have been obvious to implement Dornbusch’s crank input (the “**second directional input device**”) as a bidirectional crank according to Moritome. (Polish, ¶¶281, 257-266.) In the combined system, the “**processor**” would be “**coupled**” to the bidirectional crank input (the “**second directional input device**”) and receive signals (the “**second directional input**”).

signal”) from the bidirectional crank input. (Polish, ¶281.) Motivations to combine are addressed above.

- (e) **“a memory subsystem, the memory storing an operating system executed by the processor to display on the display a graphical user interface for controlling the operation of the handheld computing device, wherein the graphical user interface provides a graphical element” (Claim 1[e])**

Claim 1[e] is disclosed by or obvious over Dornbusch. Dornbusch has a **“memory subsystem, the memory storing an operating system executed by the processor.”** Dornbusch’s ROM cartridge serves as the **“memory subsystem”** of Dornbusch’s game device, **“storing an operating system”** (i.e., the game software) **“executed by the processor”** (i.e., the microprocessor in the game device disclosed by Dornbusch). (Dornbusch, 4:7-9, 6:39-42; Polish, ¶¶282-290; EX1017, p.007 (“ROM cartridge,” “ROM”).)

Dornbusch discloses an operating system that **“display[s] on the display a graphical user interface for controlling the operation of the handheld computing device, wherein the graphical user interface provides a graphical element.”** Dornbusch discloses that its game system generates a graphical display for a fishing game that allows a user to control various graphical elements, including a boat and a lure. (Dornbusch, 4:8-11, Abstract (“play a fishing game and to control an electronic game device”), 9:21-68, 2:34-52, 3:24-35, 4:25-37, 6:18-25, 10:28-52;

Polish, ¶¶285-290, 229-230, 243, 254.) Dornbusch's game provides a **“graphical user interface”** in the form of a graphical display that shows a **“graphical element,”** such as a fishing boat or a lure. (Dornbusch, 9:21-68 (moving the boat graphical element on the display), 2:34-52, 3:24-35, 4:25-37, 6:18-25, 10:28-52; '731, 1:29-31; Polish, ¶¶283-287.)

Dornbusch also discloses displaying a “menu containing various options to be selected before game play can begin, such as select lure, move boat, cast, and end the game.” (Dornbusch, 7:22-26; '731, 1:29-31; Polish, ¶¶286-287.) In Dornbusch's menu example, the “cursor” that moves up and down the menu constitutes the **“graphical element,”** which is part of the **“graphical user interface”** of the displayed menu. (Dornbusch, 8:10-24 (disclosing “mov[ing] the cursor up the menu” and “down the menu”); Polish, ¶¶287, 284-290.)

Alternatively, Dornbusch in view of Uragami and Nakano (EX1026) renders claim 1[e] obvious. (Polish, ¶¶291-300, 82-85.) Uragami and Dornbusch are fishing controllers, with Uragami teaching more detail for various components, including “a CPU, RAM, ROM, and timer[.]” (Uragami, [0012], [0002], [0012]-[0014]; Polish, ¶¶229-241, 278-280, 291.) Uragami discloses that its device contains a “game program” that is “stored in a non-volatile memory inside the microcontroller 21.” (Uragami, [0017].) The game program (**“operating system”**)

provides the instructions for the microcontroller **21**, which “execut[es] a game program to perform game processing in response to” the various input signals and “to display progress in the game processing on the display panel[.]” (Uragami, [0008], [0021]-[0023], [0026], Claim 1; Polish, ¶291.) To the extent necessary, Nakano further renders obvious claim 1[e]. (Polish, ¶292.) Nakano describes a portable electronic device that includes “a program memory 41a inside and a nonvolatile memory 46. The program memory **41a** incorporates an operating system that controls the operation of” Nakano’s handheld device. (Nakano, [0141] (emphasis added).) Nakano thus teaches “**a memory subsystem, the memory storing an operating system**” (program memory **41a** incorporates an operating system), where the operating system is “**executed by [a] processor**” (microcomputer executes programs under control of the operating system). (Nakano, [0141]-[0142]; Polish, ¶¶292-300.) In Nakano, the “operating system [] controls the operation of” a handheld device to “**display on the display**” (display means **44**) “**a graphical user interface**” (Figs. 22-24 show a user interface for the calculator program) “**for controlling the operation of the handheld computing device,**” (the calculator interface is used to control calculations performed by the child machine) “**wherein the graphical user interface provides a graphical element**” (cursor **307** is a graphical element). (Nakano, [0141], [0143];

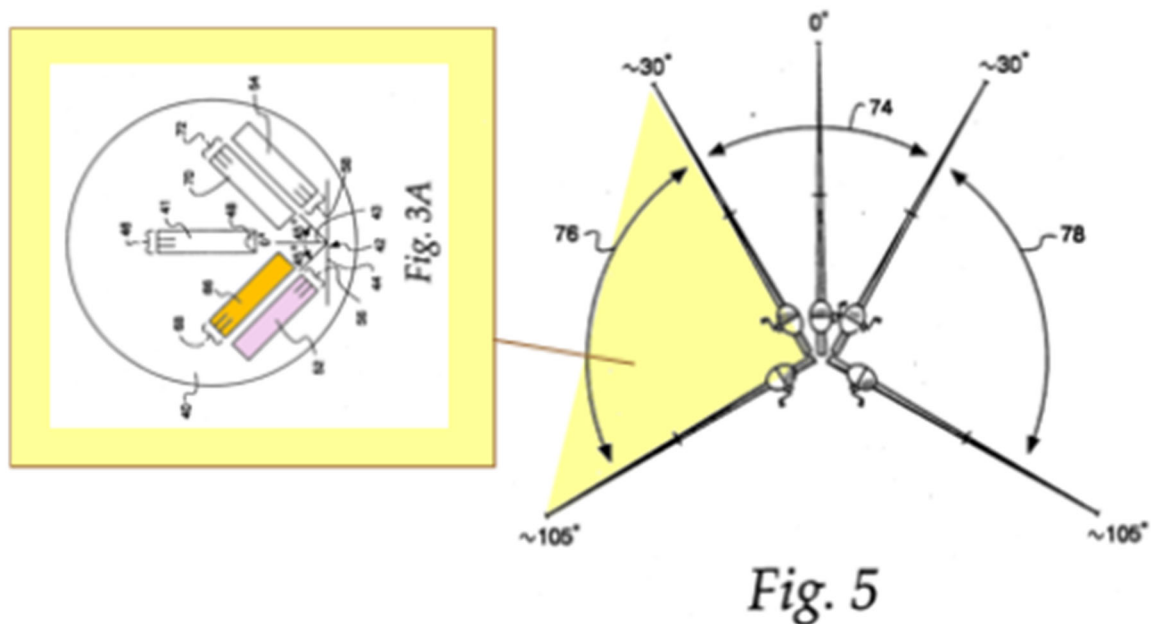
Motivation to Combine: Nakano is analogous art to the '731 patent because it is directed at a portable electronic device with a display and a memory subsystem. (Nakano, Abstract, [0141]-[0143]; Polish, ¶¶299, 295.) A POSITA would have been motivated to combine Nakano and Dornbusch, because in view of Nakano, it would have been obvious to include an operating system in the handheld device taught by Dornbusch and Uragami to execute a fishing video game as well as other non-video game programs. (Polish, ¶¶296, 293-295.) Nakano further renders obvious that the operating system can be used to execute software stored in a removable medium (e.g., ROM cartridge, disc, memory card) or downloaded into memory on the device. (Nakano, [0007]-[0008], [0020]-[0021], [0032]-[0034], [0141]-[0142]; Polish, ¶294.) Following Nakano's teaching, a POSITA would have readily understood that an operating system (whether on the main system in Dornbusch or in a portable device in Uragami) can be used to execute game software stored locally or on a removable medium. (Polish, ¶¶292-300.) The combination would have been straight-forward with a reasonable expectation of success. (Polish, ¶298.)

- (f) **“wherein the operating system comprises processor-executable instructions that cause the graphical element to move by the amount of displacement in a direction substantially parallel or substantially perpendicular to the orientation.” (Claim 1[f])**

Claim 1[f] is disclosed by or obvious over Dornbusch. Dornbusch discloses

that “**the operating system comprises processor-executable instructions.**”

(Dornbusch, 4:7-9; EX1017, p.007; Polish, ¶¶301-302, 284-290.) Dornbusch discloses that its game system “**cause[s] the graphical element to move by the amount of displacement in a direction [] parallel or [] perpendicular to the orientation.**” Dornbusch discloses that when its sensors indicate that it is tilted to the left and the crank is rotating, it causes a graphical element (a boat or a lure) to move left. (Dornbusch, 9:50-54; Polish, ¶¶301-307.)



(Dornbusch, Figs. 3A & 5 (highlighting added), 6:6-20, 9:64-68, 6:20-25.) At the 90 degrees left orientation, the movement of the graphical element (boat or lure) to the left is movement “**by the amount of displacement**” (i.e., the amount of displacement indicated by a pulse from the crank circuitry) “**in a direction []**

parallel or [] perpendicular to the orientation (i.e., left—a direction “**parallel**” to the “**orientation**”). (Polish, ¶¶303-307.)

As another example, Dornbusch discloses that on its “menu” screen, a user can “move the cursor up the menu” by turning the crank **18** “while the rod is in the upright position, which closes the second and third mercury switches **52** and **54**.” (Dornbusch, 8:10-12, 8:19-24; Polish, ¶305 (emphasis added).) When the fishing controller is oriented straight up, the movement of the cursor (a “**graphical element**”) up the menu is movement “**by the amount of displacement**” (i.e., one selection, as indicated by the “**second directional input signal**” derived from the crank output) “**in a direction [] parallel or [] perpendicular to the orientation**” (i.e., up—a direction “**parallel**” to the “**orientation**”). (Dornbusch, Figs. 4, 5, 5:21-6:24; Polish, ¶¶305-307.)

Alternatively, Dornbusch in view of Uragami and Nakano renders claim 1[f] obvious. (Polish, ¶¶308-309, 82-85, 70-72.) Dornbusch teaches that the game controller can be used to control “casting” by detecting a specific set of movements—such as flicking the user’s wrist so the rod changes from a tilted backward position to a tilted forward position. (Dornbusch, 2:42-44, 5:21-33, 10:1-27, Fig. 4.)

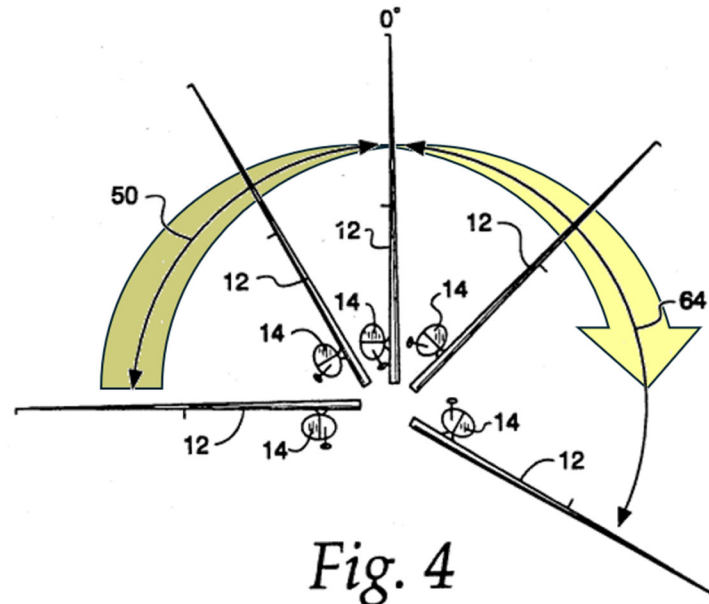


Fig. 4

(Dornbusch, Fig. 4 (annotation added); Uragami, [0017], [0008], [0012].)

Dornbusch states that the game controller is intended to replace the controller typically used for “The Black Bass” game (Dornbusch, 4:12-17), which included an on-screen casting strength indicator (red bar-meter “indicates your casting power”).

(EX1018, p.011; Polish, ¶309.) It would have been obvious to implement this casting strength indicator to move along the bottom or the side of the screen, which would be “**by the amount of displacement in a direction [] parallel or [] perpendicular to the orientation.**” (Polish, ¶¶309, 303-307.) Motivations to combine are discussed above. (Polish, ¶¶308-309, 292-299.)

2. Claim 2

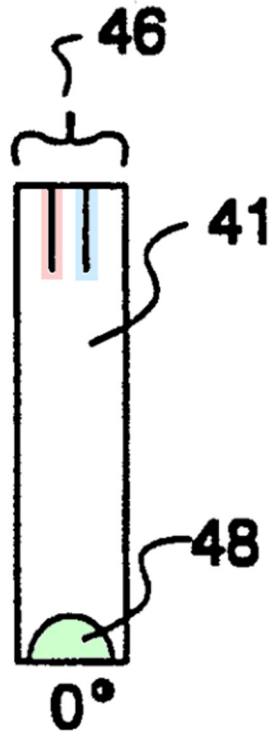
- (a) **“The handheld computing device of claim 1, wherein the internally-located directional input device comprises” (Claim 2[p])**

Dornbusch discloses claim 2[p] for the same reasons as claims 1[p] and 1[b].

(Polish, ¶¶311, 229-252.)

- (b) **“a primary contact positionally fixed in the handheld computing device” (Claim 2[a])**

Dornbusch discloses claim 2[a]. Dornbusch discloses that its mercury switches comprise **“a primary contact positionally fixed in the handheld computing device.”** Figure 3A shows mercury switch **41** is oriented such that in this example the **drop of mercury 48** does *not* connect the electrical contacts (**red** and **blue** below).



(Dornbusch, Fig. 3A (excerpt; highlighting added), 5:34-37, 10:7-11, 5:3-15, 3:8-23, 5:21-6:34, Figs. 4-5; Polish, ¶¶312-322, 63-69.) Figure 3A shows several **mercury switches** arranged in different directions:

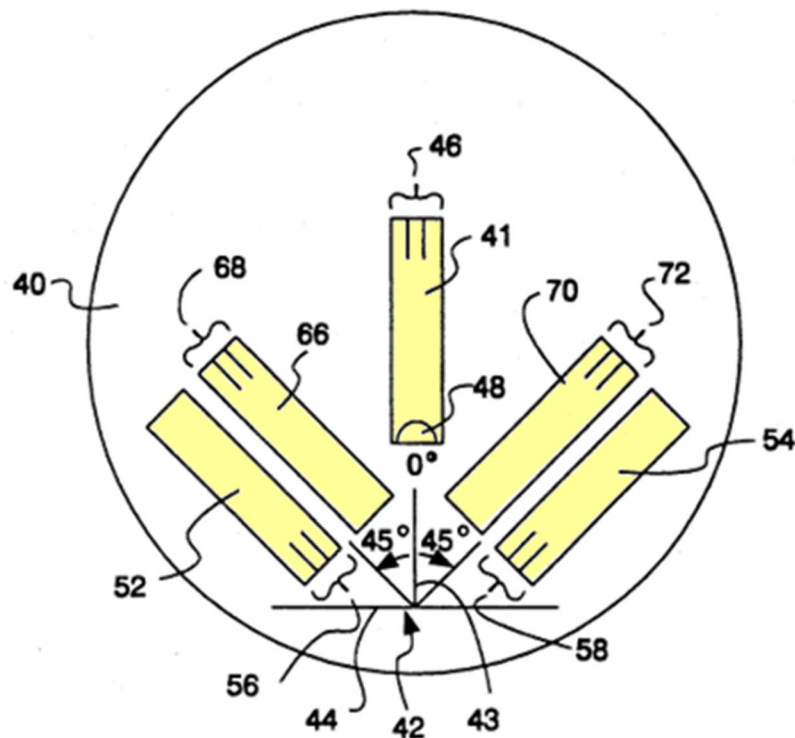


Fig. 3A

(Dornbusch, Fig. 3A (highlighting added); Polish, ¶315.) Dornbusch discloses that as the handheld computing device changes orientation, the mercury drops move within the mercury switches, connecting or disconnecting the circuit between the two contacts as they move. (Dornbusch, 6:6-13, Figs. 3A, 5, 6:6-13; Polish, ¶316.) Dornbusch discloses that zone 76 in Figure 5 represents a set of orientations where mercury switch 52 is open and mercury switch 66 is closed. (Dornbusch, 6:6-25, Figs. 3A, 5.)

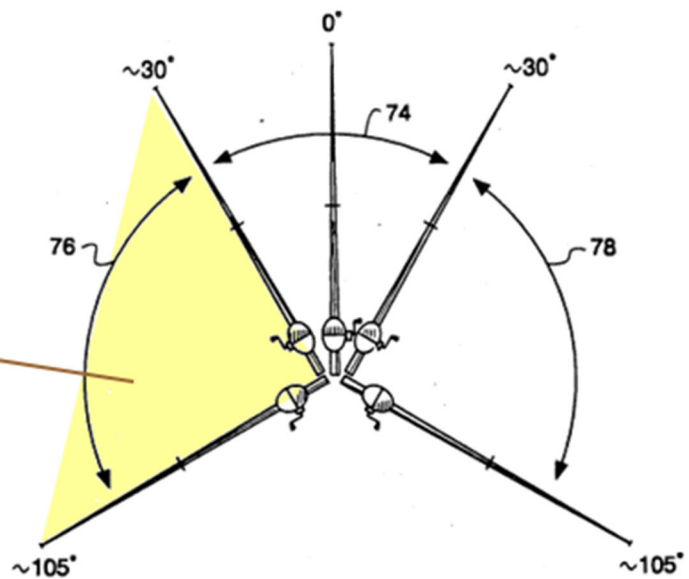
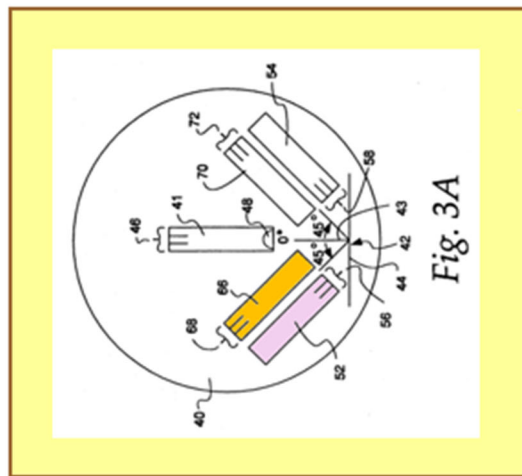
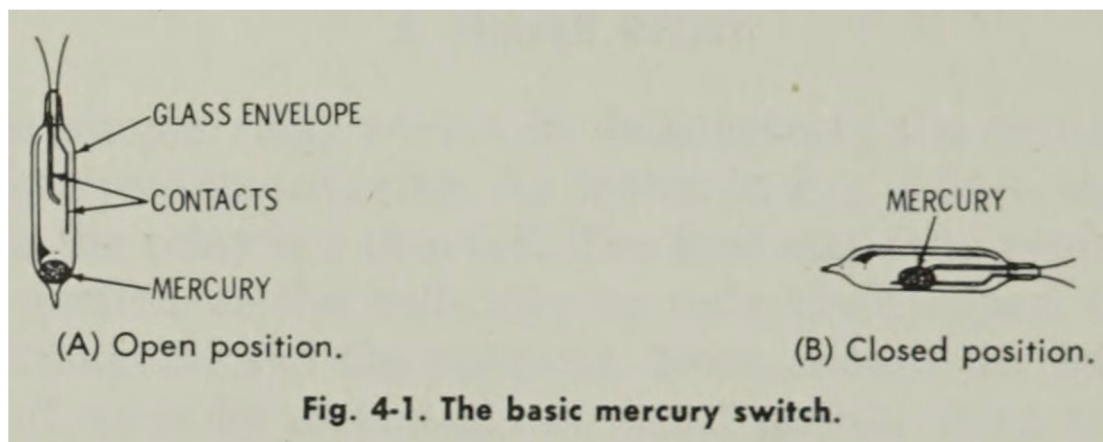


Fig. 5

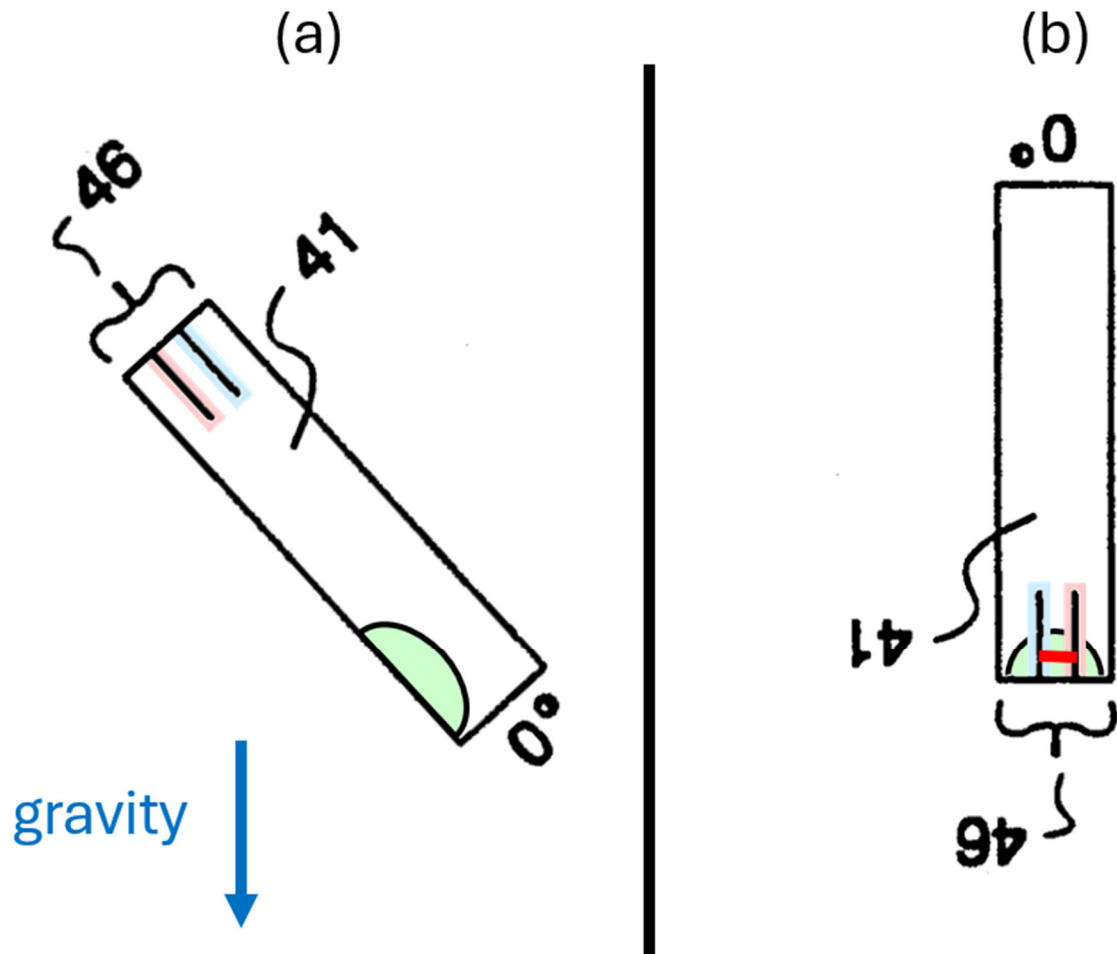
(Dornbusch, Figs. 3A, 5 (highlighting added), 6:6-20; Polish, ¶¶316-319.)

When mercury switch **41** changes orientation, the mercury drop **48** moves, causing the electrical contacts **46** to electrically connect in certain orientations. (Polish, ¶319; Dornbusch, 3:54-59.)



(EX1019, pp.007, 006, 003.) Gravity either pulls the drop of mercury toward the

contacts and closes the circuitry, or away from the contacts and opens the circuit:



(Dornbusch, Fig. 3A (excerpt; highlighting and annotations added; modified); Polish, ¶¶320-322.) Either of the contacts (the red- and blue-elements) is “a primary contact positionally fixed in the handheld computing device.” (Polish, ¶322.)

(c) “at least one directional contact positionally fixed in the handheld computing device and operatively connected to the primary contact;” (Claim 2[b])

Dornbusch discloses claim 2[b]. Dornbusch discloses that its mercury

switches comprise “**at least one directional contact positionally fixed in the handheld computing device and operatively connected to the primary contact.**”

As discussed above, Dornbusch discloses that each of its mercury switches contains two positionally fixed contacts and a movable drop of mercury. (Dornbusch, 5:3-15, 10:7-11, 5:34-37, 3:8-23, 4:55-5:2, Fig. 3A; Polish, ¶¶313-322.) Either contact (e.g., red- or blue-highlighted above) in any of Dornbusch’s switches constitutes “**a primary contact positionally fixed in the handheld computing device.**” (Polish, ¶¶324-325, 322.) Similarly, either contact constitutes a “**directional contact positionally fixed in the handheld computing device,**” depending on which contact is considered the “**primary contact.**” (Polish, ¶¶324-326.) For example, if the red-highlighted contact above is the “**primary contact,**” then the blue-highlighted contact is the “**directional contact**”—and vice versa. (Polish, ¶¶326, 324.) As Dornbusch’s device changes position or orientation, the contacts do not change position relative to each other or other positionally fixed elements within the device. (Dornbusch, Figs. 3A-3B; Polish, ¶325.) Regardless of whether the red- or blue-highlighted contact is the “**directional contact,**” it is “**operatively connected to the primary contact,**” because the two contacts are both fixedly connected to the handheld device, so they are “**operatively connected**” through the handheld computing device. (Dornbusch, 5:3-15, 10:7-11, Fig. 3A; EX1019,

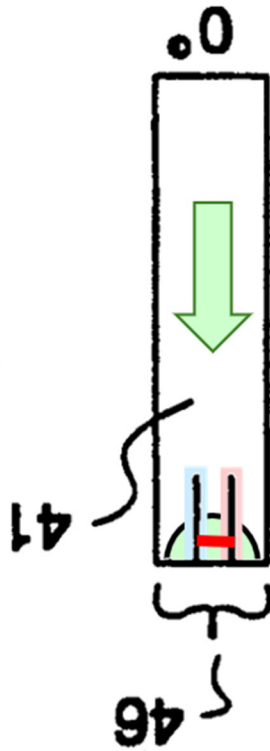
pp.006-07; Polish, ¶326.) Dornbusch's two contacts are connected by the drop of mercury in certain orientations, so Dornbusch discloses that they are **"operatively connected"** by the drop of mercury. (*Id.*)

- (d) **"circuit closing means, movable on, and in electrical contact with, the primary contact, the circuit closing means moving in response to inclination of the handheld computing device in the direction of any one of the at least one directional contact, between a neutral position in which the primary contact and the any one of the at least one directional contact form an open circuit, and an active position in which the primary contact and the any one of the at least one directional contact form a closed circuit; and"**
(Claim 2[c])

Dornbusch discloses claim 2[c]. As noted above, if **"circuit closing means"** is a means-plus-function limitation, the function is to move in response to inclination of the handheld computing device between a neutral position in which the primary contact and a directional contact form an open circuit, and an active position in which the primary contact and a directional contact form a closed circuit, and the corresponding structure is either a "ball bearing or a mercury contact." ('731, 4:8-10, 6:12-14, Figs. 1-5; Polish, ¶331.)

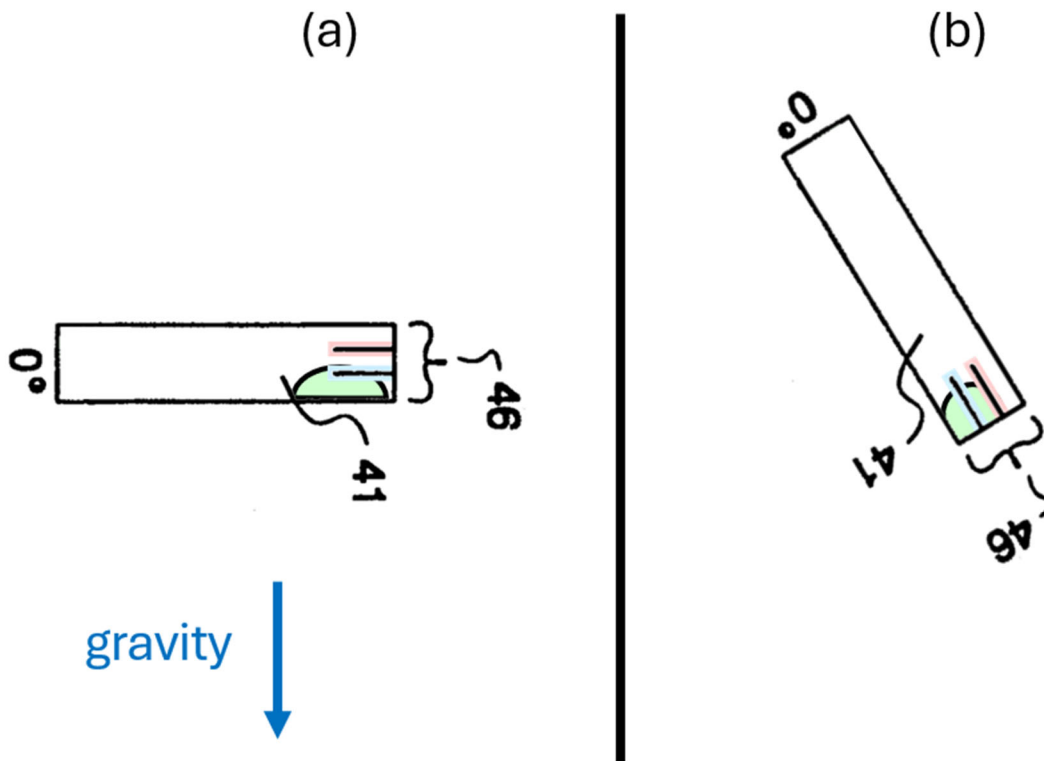
The drop of mercury in any of Dornbusch's mercury switches is a **"circuit closing means,"** because it closes the circuit between the contacts of the mercury switch (e.g., contacts **46** in mercury switch **41**). (Dornbusch, 5:13-15, 6:6-13, 10:7-11, 5:34-37, 3:8-23, 4:55-5:2, Fig. 3A; Polish, ¶¶327-340; '731, 6:17-21,

4:8-10, 10:32-33.) The drop of mercury is “**movable on**” the “**primary contact**”—i.e., the drop can move along either of the contacts **46** as the switch changes orientation. (Dornbusch, Fig. 3A; EX1019, pp.006-07; Polish, ¶¶332-333.) Dornbusch discloses that the mercury drop is in “**electrical contact with, the primary contact.**” (Dornbusch, 5:13-15, 6:6-13, Fig. 3A; Polish, ¶334.) The drop of mercury “**mov[es] in response to inclination of the handheld computing device.**” (Dornbusch, 3:8-23 (“The mercury switches are placed on the circuit board in specific locations so that the game controller can sense the position of the fishing rod as the rod is moved in various directions by the game player.”), 5:3-15, 10:7-11, 5:34-37, 4:55-5:2, Fig. 3A; Polish, ¶336.) Dornbusch further discloses that the drop of mercury moves in response to inclination of the handheld computing device “**in the direction of any one of the at least one directional contact.**” (Polish, ¶337.) Figure 3A shows the result of the movement of the drop of mercury “**in the direction of any one of the at least one directional contact**” (green arrow)—with the drop of mercury touching the directional contact of the switch.



(Dornbusch, Fig. 3A (excerpt; highlighting added; modified); Polish, ¶337.)

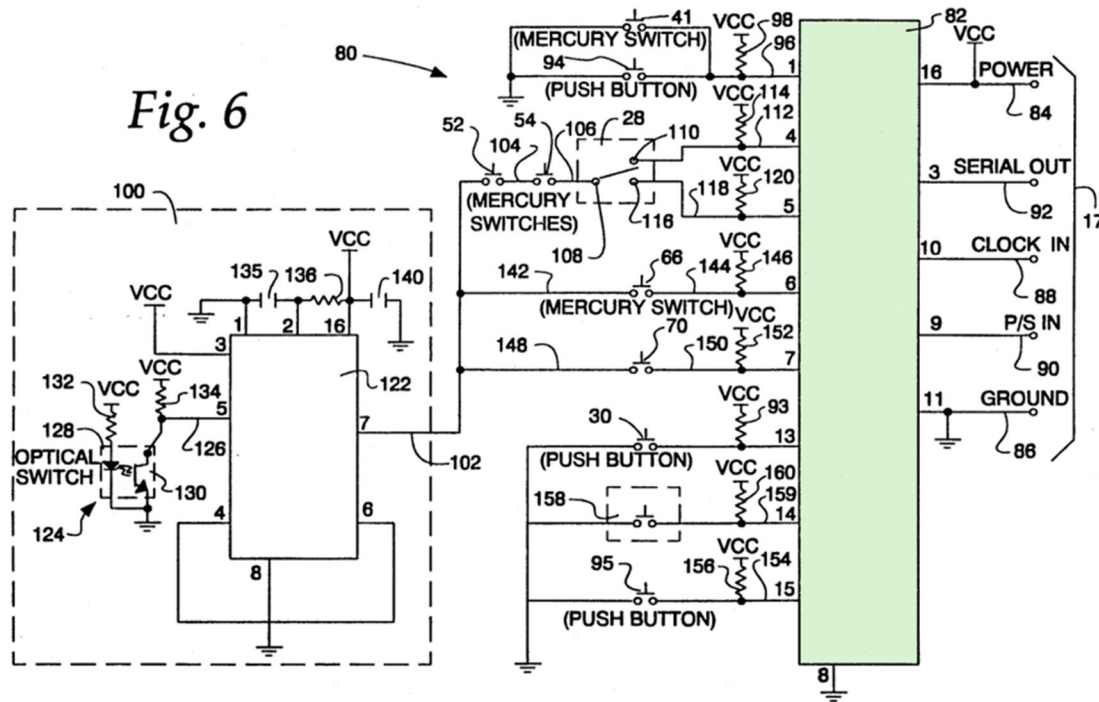
Two example positions (blue contact in switch 41 is the “**primary contact**”) are below—item (a) is a “**neutral position**” where the contacts form an “**open circuit**” and item (b) is an “**active position**” where the contacts form a “**closed circuit.**”



(Dornbusch, Fig. 3A (excerpt; highlighting added; modified), 6:13-32, 10:20-22, Figs. 4, 5; Polish, ¶¶338-340.) The drop of mercury has “**mov[ed] in response to inclination of the handheld computing device in the direction of any one of the at least one directional contact**”—all while being in electrical contact with the “**primary contact.**” (Polish, ¶340.)

- (e) “**a direction interpreter, operatively connected to the primary contact and the at least one directional contact, for generating the directional input signal.**” (Claim 2[d])

Dornbusch discloses claim 2[d]. Interface circuitry **82** is highlighted below:

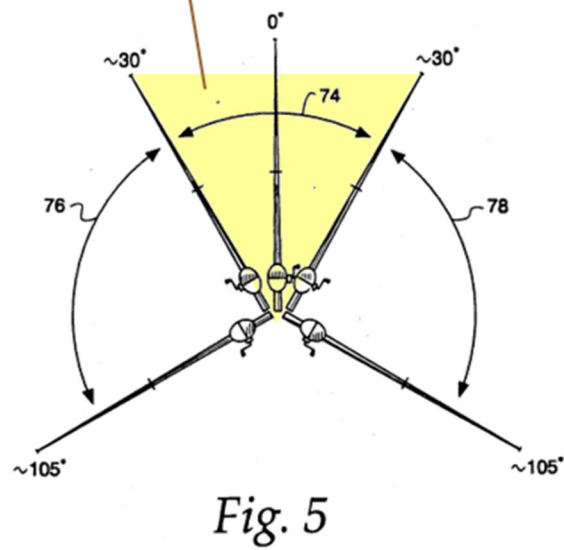
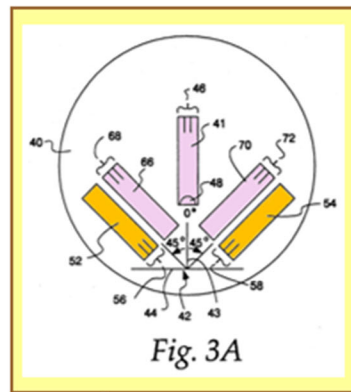


(Dornbusch, Fig. 6 (highlighting added); Polish, ¶¶341-344.) Dornbusch discloses that the interface circuitry takes the signals from the mercury switches and converts them (i.e., it acts as a **“direction interpreter”**) into a signal usable by the game device. (Dornbusch, 7:12-15 (“interface IC **82** recognizes the states of the switches in the electronic game controller **10** and converts those states to the serial output signal on the conductor **92** for the game device”), 6:42-53, 7:1-11, 9:36-39, 9:52-54, 9:66-68, 10:12-14, 6:25-32; Polish, ¶342.) Dornbusch’s interface circuitry is **“operatively connected to the primary contact and the at least one directional contact.”** (Polish, ¶343.) Interface circuitry **82** is connected to one end of mercury switches **41**, **54**, **66**, and **70**. (Dornbusch, Fig. 6, 7:58-8:1, 8:15-18, 10:7-9, 9:43-52, 9:57-66; Polish, ¶343.) When switch **54** is closed, interface circuitry is also

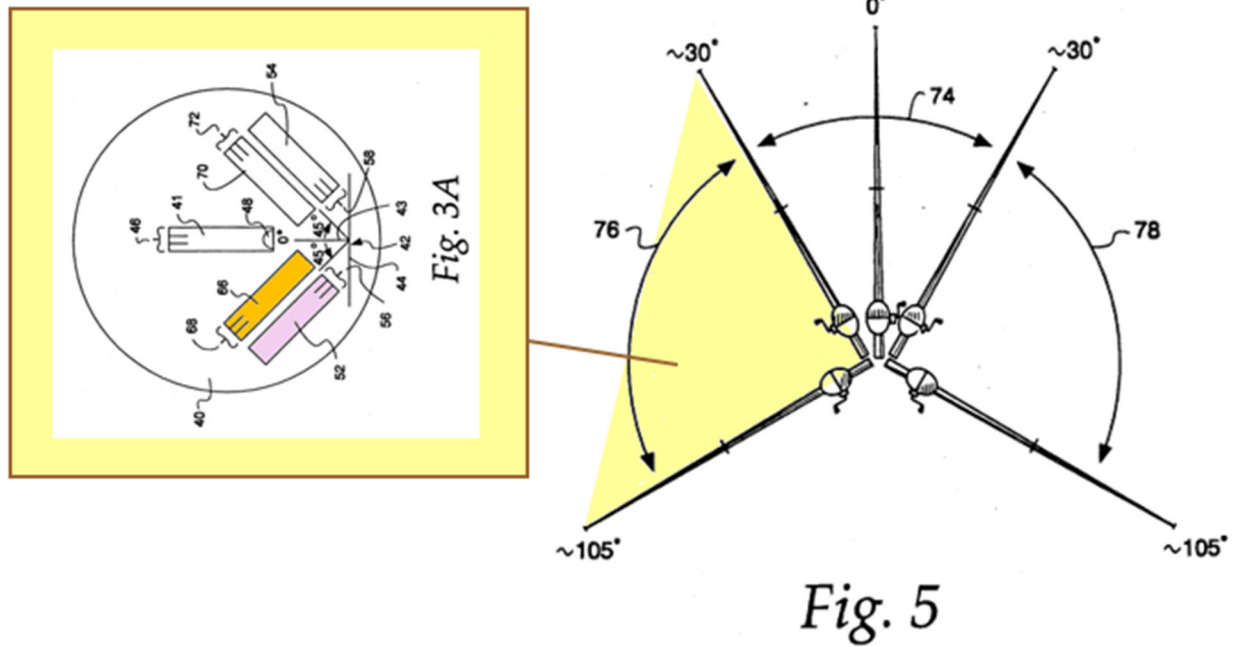
connected to mercury switch **52**. (Dornbusch, 7:58-8:1, 8:15-18.) Dornbusch's interface circuitry also "**generat[es] the directional input signal**." (Polish, ¶344.) Dornbusch outputs a serial output signal on pin **3** to a game device via conductor **92**, which includes signals indicating the states of the mercury switches and serving as a "**directional input signal**" for controlling gameplay. (Dornbusch, 6:42-54, 7:1-7, 7:12-15, 9:30-32, 9:36-39, 9:52-54, 9:66-68, 10:12-14, 4:1-4; Polish, ¶344.)

3. Claim 3: "The handheld computing device of claim 2, wherein the directional input signal is uniquely associated with the direction of the inclination."

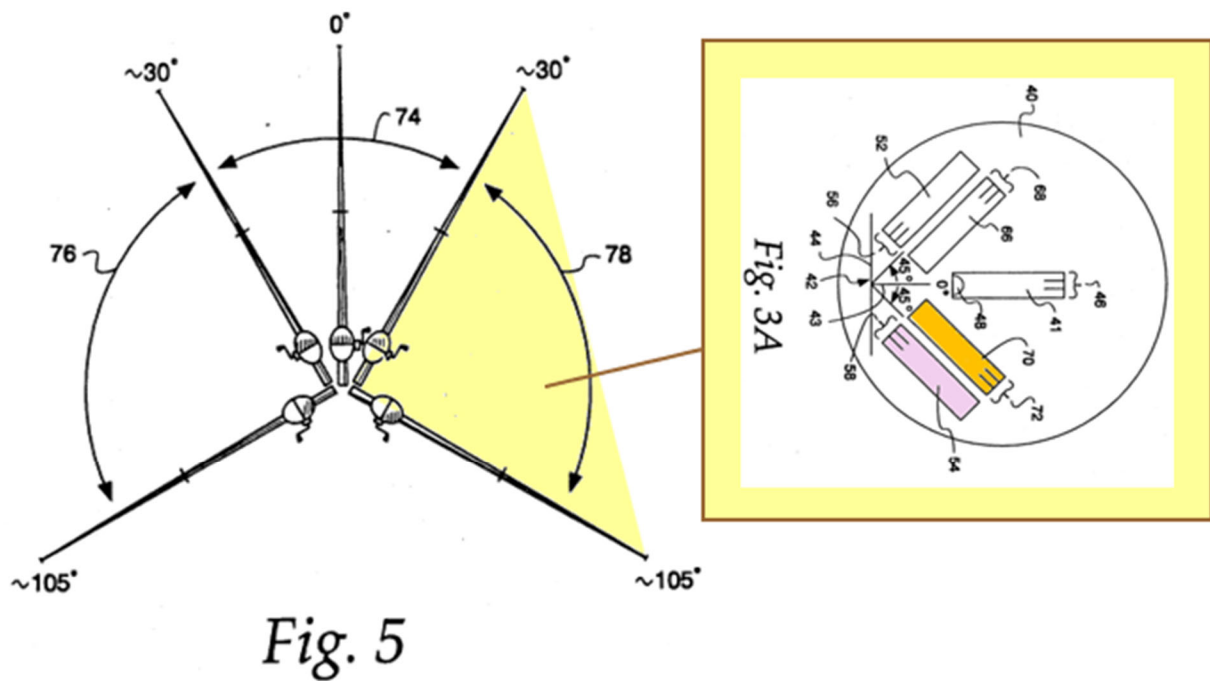
Dornbusch discloses claim 3. Dornbusch discloses that its "**directional input signal**" (i.e., the information in the output signal from the interface circuitry reflecting the state of the mercury switches) is "**uniquely associated with the direction of the inclination**." (Dornbusch, Figs. 3A, 5; Polish, ¶346.) Dornbusch teaches unique mercury switch states corresponding to different inclination directions, which would be reflected in different "**input signal[s]... uniquely associated**" with the different inclination directions:



(Dornbusch, Figs. 3A, 5 (highlighting added), 6:6-13; Polish, ¶¶345-346.)



(Dornbusch, Figs. 3A, 5 (highlighting added), 6:6-20; Polish, ¶346.)



(Dornbusch, Figs. 3A, 5 (highlighting added), 6:20-25; Polish, ¶346.)

4. **Claim 11:** “The handheld computing device of claim 1, wherein the processor is configured to detect movement patterns from the directional input signal and wherein the graphical element is further responsive to the detected movement patterns.”

Dornbusch discloses claim 11. As discussed above for claim 1[d], Dornbusch discloses a “**processor**”—i.e., the microprocessor in the gaming device. (Polish, ¶¶271-281.) As a fishing simulation gaming device, Dornbusch discloses detecting “**movement patterns**” (e.g., “casting the line and reeling in the line in various directions,” “invitingly presenting the lure to a waiting fish by causing the lure to move from side to side,” and moving “the rod and reel” to the left and the right to select the direction of movement) to control the game. (Dornbusch, Abstract, 3:20-23, 4:17-20, 4:29-37, 6:25-34, 9:40-54, 10:1-40; Polish, ¶¶347-348, 285, 271-281.) Dornbusch’s processor is “**configured to detect movement patterns from the directional input signal.**” (Dornbusch, 3:16-20; Polish, ¶348.)

As discussed above, Dornbusch discloses various graphical elements that are “**responsive to the detected movement patterns.**” (Polish, ¶¶301-309, 348; *supra* analysis for claim 1[f].) For example, Dornbusch discloses that a boat and a lure are each graphical elements that respond to the orientation of the device through the “**directional input signal.**” (Dornbusch, 9:50-54, Figs. 3A, 4, 5, 6:6-20, 9:64-68, 6:20-25, 5:21-6:24, 2:42-44, 5:21-33, 10:1-27; Polish, ¶¶303-307, 348, 309.) As a user makes multiple movements in a row (a “**movement pattern[]**”), these graphical

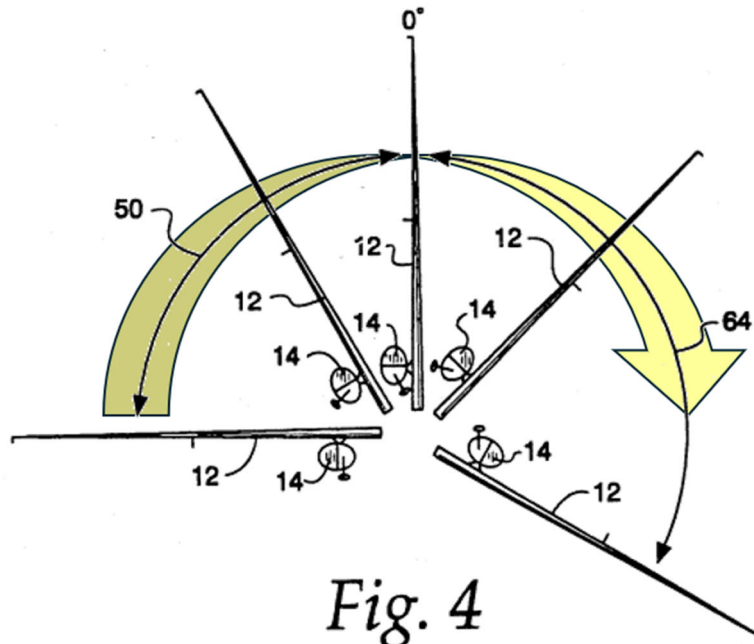
elements respond to those patterns. (Dornbusch, 3:16-20, 3:20-23, 4:17-20, 4:29-37, 6:25-34, 9:40-54, 10:1-40; Polish, ¶348.)

5. Claim 13: “The handheld computing device of claim 11, wherein the graphical element is configured to perform a selection function in response to the detected movement pattern.”

Dornbusch discloses claim 13. As discussed for claims 1[f] and 11, the **“graphical element” “respon[ds] to the detected movement pattern.”** (Polish, ¶¶303-309, 347-348.) In response to the detected movement pattern, the graphical element is further **“configured to perform a selection function.”** Dornbusch discloses that the boat selects where to fish in response to detecting a tilting movement pattern of the game controller. (Dornbusch, 9:21-67, 4:12-17; EX1018, p.010; Polish, ¶¶349-353.) The graphical element (the boat) is used to perform a selection function (where to fish) in response to the detected movement pattern. (*Id.*)

Dornbusch also teaches controlling the direction of travel of the lure through the water in response to detecting a tilting movement pattern of the game controller. (Dornbusch, 10:27-40; EX1018, p.014; Polish, ¶352.) The graphical element (the lure) is used to perform a selection function (the orientation of the lure and therefore the direction the lure travels) in response to the detected movement pattern. (Dornbusch, 9:50-54, Figs. 3A, 4, 5, 6:6-20, 9:64-68, 6:20-25, 5:21-6:24, 2:42-44, 5:21-33, 10:1-27; Polish, ¶352, 303-307, 309.)

Dornbusch also teaches that the controller can be used to control “casting” by detecting a specific set of movements—such as flicking the user’s wrist so the rod changes from a tilted backward position to a tilted forward position as shown in the annotated Figure 4 below. (Dornbusch, 2:42-44, 5:21-33, 10:1-27; Polish, ¶353.)



(Dornbusch, Fig. 4 (annotation added), 4:12-17; EX1018, p.011; Polish, ¶353.)

The graphical element (on-screen casting strength indicator) is configured to perform a selection function (selecting casting power) in response to the detected movement pattern (casting motion). (*Id.*)

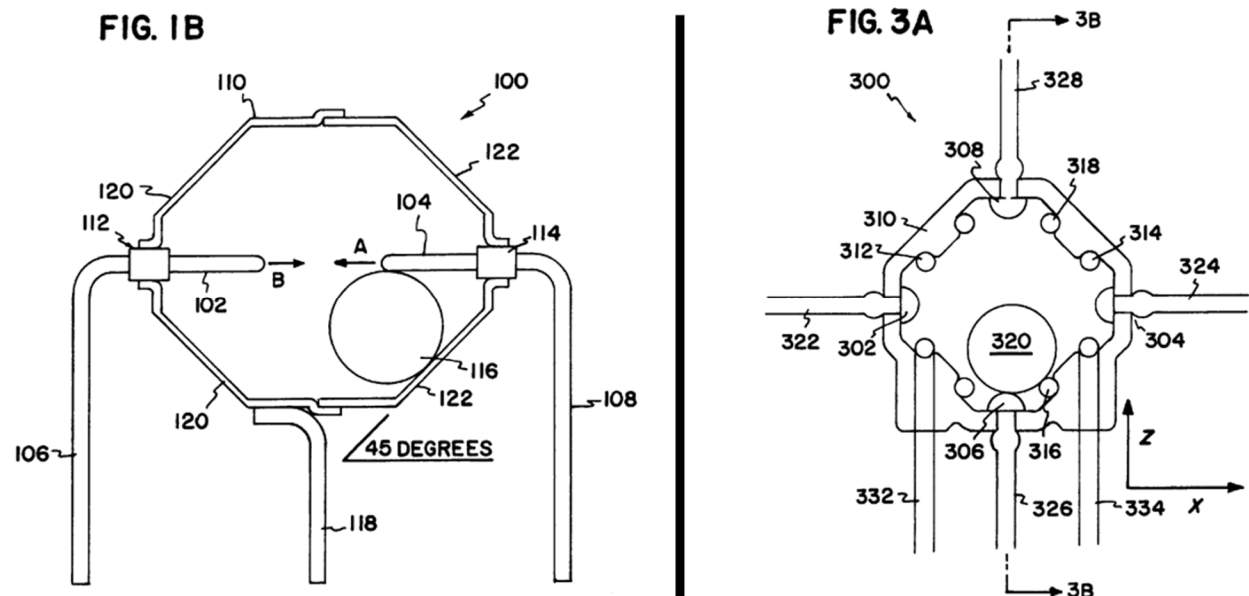
6. Claim 14: “The handheld computing device of claim 13, wherein the detected movement pattern is a flick of the wrist.”

Dornbusch discloses claim 14. Dornbusch discloses that one of its “**detected movement pattern[s]**” is a cast of a fishing line. (Dornbusch, 2:42-44, 5:21-33,

4:29-34, Fig. 4; Polish, ¶¶354-355, 64-68.) Dornbusch teaches a “flick of the wrist” casting movement. (Dornbusch, 2:42-44, 5:21-33, 4:29-34, Fig. 4; Polish, ¶355.)

E. Claims 2 and 3 Are Obvious Over Dornbusch in View of Uragami and Titus (Ground 9), and Obvious Over Dornbusch in View of Uragami, Moritome, Nakano, and Titus (Ground 10)

As explained above, Titus’s tilt switch arrays satisfy claims 2 and 3 of the ’731 patent. (Polish, ¶¶197-227, 356-364, 77-81.)



(Titus, Figs. 1B, 3A.) Titus combined with either Ground 7 or Ground 8 renders claims 2 and 3 obvious. (Polish, ¶¶356-357.)

Motivation to Combine: Dornbusch and Titus are analogous to each other and the ’731 patent. (Polish, ¶¶364, 199, 203, 241, 358.) All involve tracking orientation of an electronic device. (Polish, ¶¶358, 199; Dornbusch, 6:25-34, 10:28-40, 9:40-68, 1:5-16, 2:27-31, Figs. 2, 4, 5; Titus, 1:5-7, 1:8-11, 1:37-42.) A POSITA

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would have been motivated to combine Dornbusch with Titus for more sophisticated tracking with fewer components. (Polish, ¶¶359-363; Dornbusch, 5:30-6:25, Fig. 3A; Titus, 1:37-42.) A POSITA would have had a reasonable expectation of success from the modification. (Polish, ¶363.) A POSITA would have been motivated to limit cost by substituting Titus's conductive ball-based tilt sensors for Dornbusch's mercury switches. (Polish, ¶362.) A POSITA would have viewed mercury switches and tilt switches as interchangeable substitutes. (Polish, ¶¶363, 358-362; EX1020, 1:35-37.)

VIII. NO SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS

PO has not identified any alleged objective evidence of non-obviousness, nor is Petitioner aware of any.

IX. CONCLUSION

Petitioner requests IPR institution.

Dated: October 8, 2025

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this petition complies with the type-volume limits of 37 C.F.R. § 42.24(a)(1)(i) because it contains 13,981 words, according to the word-processing system used to prepare this petition, excluding the parts of this petition that are exempted by 37 C.F.R. § 42.24(a) (including the table of contents, a table of authorities, mandatory notices, a certificate of service or this certificate word count, appendix of exhibits, and claim listings).

DATED: OCTOBER 8, 2025

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. Sections 42.6 and 42.105, that a complete copy of the attached **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,115,731 B2** including all exhibits (**Nos. 1001-1029**) and related documents, are being served via Federal Express on October 8, 2025, the same day as the filing of the above-identified document in the United States Patent and Trademark Office/Patent Trial and Appeal Board, upon Patent Owner by serving the correspondence address of record with the USPTO as follows:

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And via Federal Express upon the following counsel for Patent Owner in *Malikie Innovations Ltd. v. Nintendo Co.* in the United States District Court, Western District of Washington, Case No. 2:24-cv-01490-JLR as follows:

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U.S. Patent No. 8,115,731 B2

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