

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

DDC TECHNOLOGY, LLC,

Patent Owner.

IPR2023-00707

U.S. Patent 9,420,075

PATENT OWNER'S RESPONSE

37 C.F.R. § 42.120

Table of Contents

I.	Introduction	1
II.	Definition of a Person of Ordinary Skill in the Art	1
III.	Claim Construction	4
A.	The Electrical Shield of Claim 7	4
B.	The Electric Shield of Claim 8	8
C.	Lever	11
IV.	Overview of the Prior Art	17
V.	Kondo and Chu Do Not Render the Challenged Claims Obvious	
	24	
A.	Claim 1	24
B.	Claim 2	30
C.	Claim 3	30
D.	Claim 4	30
E.	Claim 5	30
F.	Claim 6	30
G.	Claim 7	31

H.	Claim 8	33
I.	Claim 9	35
J.	Claim 10	35
K.	Claim 11	41
L.	Claim 12	42
M.	Claim 14	46
N.	Claim 18	47
O.	Claim 19	52
P.	Claim 20	53
VI.	Secondary Considerations of Nonobviousness.....	55
A.	Claim 1 is Entitled to a Presumption of Nexus	55
B.	Objective Evidence of Nonobviousness Tied to the DODOcase VR	
1.2	96	
VII.	Conclusion	105
CERTIFICATE OF WORD COUNT		1
CERTIFICATE OF SERVICE		1

PATENT OWNER'S EXHIBIT LIST

<u>Exhibit Number</u>	<u>Description</u>
2001	Google's Reply in Support of its Motion to Stay Pending Determination of <i>Inter Partes</i> Review of the Patents-in-Suit Case No. 3:23-cv-01160, N.D. Cal., filed April 27, 2023, ECF 160
2002	Email dated June 5, 2023 from Michael Kiklis to Matt Holohan regarding Discovery
2003	Complaint for Patent Infringement Case No. 3:22-cv-01263, N.D. Tex., filed June 10, 2022, ECF 1
2004	First Amended Complaint for Patent Infringement Case No. 3:22-cv-01263, N.D. Tex., filed January 30, 2023, lodged publicly February 2, 2023, ECF 123
2005	HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY GOOG-DDC-0000040-GOOG-DDC-0000046 (See Paper 14 for additional description)
2006	HIGHLY CONFIDENTIAL – ATTORNEYS EYES ONLY GOOG-DDC-0000029-GOOG-DDC-0000039 (See Paper 14 for additional description)
2007	HIGHLY CONFIDENTIAL – ATTORNEYS EYES ONLY GOOG-DDC-0000024-GOOG-DDC-0000026 (See Paper 14 for additional description)

<u>Exhibit Number</u>	<u>Description</u>
2008	HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY OPS000010-OPS000024 (See Paper 14 for additional description)
2009	Google Inbound Services Agreement, last modified April 13, 2023, captured on June 22, 2023, from https://support.google.com/legal/answer/10039636?sjid=14045947512057405231-NA
2010	Google ISA and Reference Version History, captured on June 22, 2023, from https://support.google.com/legal/answer/10071677?hl=en#zippy=%2Cinbound-services-agreement-isa-archive
2011	Working with Alphabet/Google, captured on June 22, 2023, from https://support.google.com/corporate-suppliers/answer/9844770?hl=en&ref_topic=9902269#a&b&c&d&e&f&g
2012	Google Supplier Purchase Order Terms and Conditions, April 2023, captured on June 22, 2023, from https://support.google.com/corporate-suppliers/answer/9844474?hl=en&ref_topic=9902369&sjid=14045947512057405231-NA&visit_id=638230555166029102-814262976&rd=1

<u>Exhibit Number</u>	<u>Description</u>
2013	Defendant Google LLC's Motion to Transfer Venue to the Northern District of California Under 28 U.S.C. § 1404(a) and to Sever Its Case, Together with Supporting Brief Case No. 3:22-cv-01263, N.D. Tex., filed November 10, 2022, ECF 94
2014	Defendant Landsberg Orora's Motion to Dismiss and Supporting Brief Case No. 3:22-cv-01263, N.D. Tex., filed September 13, 2022, ECF 68
2015	HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY OPS000009, OPS000046, and OPS000056-OPS000060 (See Paper 14 for additional description)
2016	Memorandum Opinion and Order Case No. 3:22-cv-01263, N.D. Tex., filed March 14, 2023, ECF 139
2017	CONFIDENTIAL Haller Declaration
2018	Plaintiff DDC Technology, LLC's Response in Opposition to Defendant's Motion to Stay Lawsuit Pending Patent Office's <i>Inter Partes</i> Review Case No. 3:22-cv-01263, N.D. Tex., filed June 7, 2023, ECF 145
2019	CONFIDENTIAL – ATTORNEYS' EYES ONLY – PROTECTIVE ORDER MATERIAL OPS000009, OPS000046, and OPS000056-OPS000060 (See Paper 14 for additional description)

<u>Exhibit Number</u>	<u>Description</u>
2020	ATTORNEYS EYES ONLY Email string (See Paper 14 for additional description)
2021	Capacitive vs. Resistive Touchscreens: What Are the Differences?, captured on July 12, 2023, from https://www.makeuseof.com/tag/differences-capacitive-resistive-touchscreens-si/
2022	Scheduling Order Case No. 3:22-cv-01263, N.D. Tex., filed December 20, 2022, ECF 106
2023	Complaint for Patent Infringement against Mattel, Inc. Case No. 1:21-cv-01781, D. Del., filed December 21, 2021, ECF 1
2024	HIGHLY CONFIDENTIAL – OUTSIDE ATTORNEYS’ EYES ONLY DDC_010437-DDC_010446 (See Paper 14 for additional description)
2025	Google and Mattel partner to bring back the View- Master as a VR headset, captured on June 22, 2023, from https://www.theverge.com/2015/2/13/8033179/mattel-view-master-google-cardboard-vr

<u>Exhibit Number</u>	<u>Description</u>
2026	Google Partners With Mattel to Bring VR to the Iconic View-Master captured on June 22, 2023, from https://www.wired.com/2015/02/google-mattel/
2027	Mattel's View-Master gets a Google VR makeover captured on June 22, 2023, from https://www.cnet.com/tech/computing/google-mattel-announce-a-virtual-reality-view-master/
2028	Complaint for Declaratory Judgment and Injunctive Relief against MerchSource, LLC, et al. Case No. 3:17-cv-07088, N.D. Cal., filed December 13, 2017, ECF 1
2029	Petition for <i>Inter Partes</i> Review IPR2018-00494, U.S. Patent 9,420,075, filed January 15, 2018, Paper 2 DDC_003868-DDC_003949
2030	Petition for Post Grant Review PGR2018-00020, U.S. Patent 9,811,184, filed January 15, 2018, Paper 2 DDC_007993-DDC_008071
2031	CONFIDENTIAL DDC_010483-DDC_010487 (See Paper 14 for additional description)

<u>Exhibit Number</u>	<u>Description</u>
2032	CONFIDENTIAL DDC_010488-DDC_010492 (See Paper 14 for additional description)
2033	Buckley Declaration
2034	CONFIDENTIAL DDC_010511-DDC_010515 (See Paper 14 for additional description)
2035	Email from October 13, 2014 from Nartker to Buckley, Dalton, Zabarauskas, Rayford, Subject: New Cardboard Partnership Leads DDC_018503
2036	DODOcase Kickstarter Campaign identifying VR Viewers as “Patent Pending” DDC_018341-DDC_018356
2037	CONFIDENTIAL DDC_010613-DDC_010617 (See Paper 14 for additional description)
2038	MerchSource, LLC, et al Notice of Subpoena to Google, Inc. Case No. 3:17-cv-07088, N.D. Cal., served April 27, 2018

<u>Exhibit Number</u>	<u>Description</u>
2039	Defendant Google LLC’s Supplemental Objections and Responses to Plaintiff DDC Technology, LLC’s First Set of Interrogatories to Defendant Google LLC (No. 1) Case No. 3:22-cv-01263, N.D. Tex., served January 6, 2023
2040	Complaint for Patent Infringement against Unofficial Cardboard, Inc. Case No. 1:21-cv-05596, N.D. Ill., filed October 21, 2021, ECF 1
2041	HIGHLY CONFIDENTIAL – OUTSIDE ATTORNEYS’ EYES ONLY DDC_010418-DDC_010436 (See Paper 14 for additional description)
2042	HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY GOOG-DDC-0000365 (See Paper 14 for additional description)
2043	Email on August 27, 2015 from Google (WWGC) to DODOcase (Dalton), Subject: WWGC V2 Manufacturers Guide Available Now Including two documents from zip attachment titled “wwgc_manufacturers_kit_v2.0.zip”: “WWGC Guidelines and Best Practices.pdf” version 2.0, dated August 17, 2015; and “WWGC Viewer Profile and Badge Guidelines.pdf” version 1.0, dated April 16, 2015

<u>Exhibit Number</u>	<u>Description</u>
2044	Google Form for “Google Cardboard Manufacturers” to “Apply[] to the WWGC program” captured on June 22, 2023, from https://support.google.com/cardboard/manufacturers/contact/general
2045	Google Terms of Service, effective January 5, 2022, captured on June 22, 2023, from https://www.gstatic.com/policies/terms/pdf/20220105/it7r24p9/google_terms_of_service_en_us.pdf (the static pdf version of the Terms of Service available at https://policies.google.com/terms?hl=en)
2046	Market share of mobile phone touch screens worldwide from 2013 to 2020, by technology, captured on July 12, 2023, from https://www.statista.com/statistics/616468/mobile-phone-touch-technology-share-worldwide/
2047	CONFIDENTIAL Email string (See Paper 14 for additional description)
2048	Google Android Compatibility Definition Android 7.0, downloaded on July 21, 2023, from https://source.android.com/static/docs/compatibility/7.0/android-7.0-cdd.pdf
2049	Intentionally omitted

2050	Declaration of Bob Mackey
2051	Excerpts from the Oxford Dictionary of Mechanical Engineering (2013)
2052	Excerpts from The American Heritage Dictionary of the English Language, New College Edition (1981)
2053	Deposition Transcript of Kurtis Keller
2054	Second Declaration of Patrick Buckley
2055	Google Analytics “Ecommerce Overview” report
2056	Google Analytics “Product Coupon” report

2057	Article titled, “1 Million Cardboard Headsets Shipped, Google Says,” obtained from the following URL: https://web.archive.org/web/20221210082644/https://www.roadtovr.com/1-million-cardboard-headsets-shipped-google-says/
2058	Article titled, “Google Ships Five Million Cardboard Virtual Reality Devices,” obtained from the following URL: https://www.reuters.com/article/us-alphabet-cardboard-idUSKCN0V5297/ .
2059	Article titled, “Google has Shipped Over 10 Million Cardboard VR Headsets,” obtained from the following URL: https://www.theverge.com/2017/2/28/14767902/google-cardboard-10-million-shipped-vr-ar-apps .
2060	Video clip sent by Patrick Buckley to Google employees on July 25, 2014, in the email chain included as EX2034 in IPR2023-00707 & IPR2023-00708 and as EX2024 in IPR2023-00709 & IPR2023-00711.
2061	A second video clip sent by Patrick Buckley to Google employees on July 25, 2014, in the email chain included as EX2034 in IPR2023-00707 & IPR2023-00708 and as EX2024 in IPR2023-00709 & IPR2023-00711.
2062	Google Cardboard (I/O 2015) Technical Specification v.2.0
2063	Google Cardboard Best Practices – Version 3.0 (2020)

2064	Durovis Dive 5 web page identifying compatible phones, available at https://www.durovis.com/en/product.html?id=1#compatible .
2065	Spreadsheet providing information regarding phones compatible with the Durovis Dive 5
2066	An article titled, “Google Partners with Mattel to Bring VR to the Iconic View-Master,” available at https://www.wired.com/2015/02/google-mattel/ .
2067	Screenshots from a video available at https://youtu.be/bJ0OCUqbwZM?si=_7WxKZW8oRIp0n11&t=176 .

I. Introduction

Petitioner fails to recognize fundamental differences in the touchscreen technologies utilized by the two references upon which it relies. Because of these differences a person of ordinary skill in the art (“POSA”) would not be motivated to combine them. That conclusion is bolstered by objective indicia of nonobviousness, including Petitioner’s copying of the commercial product embodying claim 1. Moreover, Petitioner fails to show that the proposed combination satisfies the additional recitations of several claims. Accordingly, Petitioner fails to carry its burden as to every proposed ground of invalidity.

II. Definition of a Person of Ordinary Skill in the Art

Petitioner’s proposed definition of a POSA gives too much weight to certain skills/experience that are of limited importance with respect to the ‘075 patent, and too little weight to other skills/experience that are pertinent to the claimed inventions of the ’075 patent. EX2050, ¶18. For example, Petitioner proposes a degree in “mechanical engineering or a related field.” Petitioner thus affords undue weight to the mechanical actuation mechanism of the claimed inventions, which mechanisms are simple machines readily understood by even those with limited specific educational background. *Id.*

Petitioner further proposes that the POSA should have knowledge of “basic optical design with lenses,” despite the fact that the ‘075 patent specification makes clear that the lenses in the claimed apparatuses are well known. Similarly, Petitioner proposed that the POSA should have knowledge of “head mounted displays,” again despite the fact that head mounted displays were well known. Petitioner’s undue weight on technologies that are well-known or not claimed elements of the inventions leads Petitioner to further contend incorrectly that a POSA should have at least two years of “professional experience in mechanical and basic optical design or engineering.” EX2050, ¶18. In fact, a POSA need not have such extensive experience in “mechanical and basic optical design or engineering;” rather, a POSA should have sufficient experience in “touchscreen technology” and “capacitive/conductive technology and materials,” because they are pertinent to the inventive elements of the claimed inventions. *Id.*

Only after contending that a POSA must have knowledge in each of the aforementioned areas, Petitioner suggests that a POSA should only have “a basic understanding of touchscreen technology.” Petitioner’s definition of a POSA is backwards. A strong understanding of touchscreen technology is fundamental to the inventions claimed in the ’075 patent; merely basic understanding would be insufficient to understand the differences between the challenged claims and the prior

art. *Id.*, ¶19. Nor would a person having only a basic understanding of touchscreen technology understand the issues involved in determining whether a POSA would have been motivated to combine references in the manner Petitioner proposes. *Id.*, ¶20.

The insufficiency of Petitioner’s definition of a POSA is further highlighted by apparent misunderstandings Petitioner has regarding touchscreen technology. *Id.*, ¶21. For example, Petitioner’s expert states that capacitive touchscreens “use the electrical properties of the body to create a change of charge at a location on a polymer coated touchscreen.” Ex. 1002 at ¶ 31. While a capacitive touchscreen *may* rely on electrical properties of the human body, as the ’075 patent discloses, it is not *necessary* for a capacitive touchscreen to rely on the human body to induce touch events. Further, the majority of touchscreens used in 2014-era smartphones are glass, not polymer or “polymer coated.” EX2050, ¶21.

Similarly, Petitioner and its expert propose that the prior art references would be combined based on the desire to reach more users, including those with “resistive touchscreen” devices. A POSA would quickly recognize the inaccuracy of that position given the extensive differences in the two technologies and the limited use of resistive touchscreen devices in personal mobile electronic devices. Further, the

poor optical properties of resistive touchscreens would render them a poor choice for use in a virtual reality headset. *Id.*, ¶23.

Petitioner's definition also places too much emphasis on mechanical engineering experience. While some familiarity with basic principles of mechanical engineering would be required, it would not require a degree in mechanical engineering or the like. Rather, the necessary familiarity with simple machines (e.g., levers and buttons) such as those that can be utilized to move a component from a first position to a second position could be obtained through minimal education and experience with such simple mechanisms. Further, while the challenged claims include “lenses,” the specification makes clear that the invention relies on existent lens technology. *Id.*, ¶24.

Therefore, a POSA would have a minimum of two years of experience in implementing touchscreen and optics technology, along with relevant education (e.g., a bachelor's degree) in science or engineering. In addition to specific academic training, a POSA may draw upon appropriate industry experience. *Id.*, ¶25.

III. Claim Construction

A. The Electrical Shield of Claim 7

Claim 7 recites “[t]he virtual reality viewer of claim 6, wherein the surface of the electrical shield is sized to have electrical properties that are sufficient to be

detected by the touch-screen based on capacitance when the input mechanism is in the extended position and only the portion of the surface is contacting the touch-screen.” By the plain language of the claim, the electrical shield must be sized to have electrical properties that are sufficient to be detected by the touch-screen based on capacitance when the input mechanism is in the extended position and only the portion of the surface is contacting the touch-screen, without relying on the electrical properties of other components or the human body. EX2050, ¶33.

This is supported by the specification. The language of claim 7 closely tracks the specification’s description of an embodiment that does not rely on the electrical properties of the human body (or any other capacitive element) to induce a touch event:

In some implementations, the electric shield is configured (e.g., sized and/or positioned) so as to have capacitive properties sufficient to be detected by a capacitive touch-screen when the input mechanism is in the extended position *and in the absence of human contact* with the electric shield.

’075 patent at 7:52-56 (emphasis added). A POSA would understand what the ’075 patent means in stating that the electric shield is configured (e.g., sized) to have capacitive properties sufficient to induce a touch event on a capacitive touchscreen. For example, a POSA would understand that (1) a relatively large total area of

electric-shield material is necessary in order to provide capacitive coupling to the rest of the world, since the value of a capacitor in general is proportional to the area of its plates; and (2) a substantially smaller area of the electric-shield material is required to contact the touchscreen, similar to the area of a human fingertip. EX2050, ¶34.

A POSA would understand that the reference to “the absence of human contact” in this passage of the ‘075 patent means that the electric shield is configured (e.g., sized sufficiently) to provide enough capacitive coupling to induce a touch event on the touchscreen, **without requiring any capacitive coupling from the human.** *Id.*, ¶35. Petitioner’s expert acknowledged that this embodiment does not rely on the properties of the user’s body to induce a touch input. EX2053, 87:11-22.

This is made clear by the immediately following sentence, which describes an alternative embodiment which does rely on the capacitive coupling between the user’s body and the rest of the world to induce a touch event:

However, it can also be appreciated that, in some implementations, the electric shield can be electrically coupled to the portion of the input mechanism that is interacted with by the user such that electrical properties of the user’s body can be utilized to induce the touch input.

’075 patent at 7:56-61; EX2050, ¶35.

A POSA would understand based on the specification's contrasting of distinct embodiments in the above passage that claim 7 is directed to the first embodiment (i.e., the embodiment in which the electric shield is configured to induce a touch event without relying on the electrical properties of the user's body). EX2050, ¶36.

This conclusion is reinforced elsewhere in the specification. For example, an electric shield according to this first embodiment is again referenced later in the specification, where the first embodiment describes an electric shield with sufficient electrical properties to induce a touch event:

The compressible pad and electrical shield material work to mimic the electrical and physical properties of a human finger so that any form of touch screen technology will register a touch event when the lever mechanism is actuated. As would be understood by those skilled in the art, the combination of physical, and electrical properties of this pad electrical shield material can be tuned to work on a variety of touch screen technologies such as capacitive or resistive touch screen technologies.

EX1001, 10:45-54; EX2050, ¶37.

As described in the specification above, the compressible pad and electrical shield “mimic” the properties of a human finger – the pad mimicking the physical properties of the finger and the electrical shield mimicking the electrical properties of

the finger. Thus, because the human finger's properties are "mimicked," the human finger is superfluous to that embodiment. *Id.*, ¶38.

As another example, the following passage of the '075 patent confirms that the first embodiment having a sufficiently sized electrical shield does not rely on the electrical properties of the human body to induce a touch event: "Moreover, the exemplary viewer and user input assembly can be configured to allow a user to interact with the touch sensitive screen without reliance on the electrical properties of the human body to induce the electrical event. For instance, the metallized film 725 can be sized such that it is suitable for inducing a touch event without requiring user contact therewith." EX1001, 10:61-67.; EX2050, ¶39.

Accordingly, a POSA reading claim 7 in the context of the specification would understand that the electric shield of claim 7 must be sized to have electrical properties that are sufficient to be detected by the touch-screen based on capacitance when the input mechanism is in the extended position and only the portion of the surface is contacting the touch-screen, without relying on the electrical properties of other components or the human body. EX2050, ¶40.

B. The Electric Shield of Claim 8

Claim 8 recites, "The virtual reality viewer of claim 6, wherein the surface of the electric shield is sized to have sufficient capacitive properties such that contact

between only the portion of the surface and the touch-screen can be detected by a capacitive touch-screen when the input mechanism is in the extended position and in the absence of human contact with the electric shield.”

Like claim 7, this claim is directed to the first embodiment disclosed in the specification in which the electric shield is sufficiently configured such that it does not rely on the electrical properties of the user’s body to induce a touch event.

EX2050, ¶42. That conclusion is separately driven by each of the following recitations of claim 8: (1) “the surface of the electric shield is sized to have sufficient capacitive properties such that contact between only the portion of the surface and the touch-screen can be detected by a capacitive touch-screen when the input mechanism is in the extended position”; and (2) “in the absence of human contact with the electric shield.” *Id.*

The first of these limitations indicates that the electric shield must be sized such that its own capacitive properties are sufficient to induce a touch event. A POSA would understand that this means that the electric shield need not rely on the electric properties of the user’s body or another capacitive device to induce a touch event. *Id.*, ¶43. As discussed regarding claim 7, the specification confirms that understanding. In two passages, the specification uses language similar to claim 8 to describe an embodiment in which the electric shield is sufficiently configured to

induce a touch event without relying on user contact. *Id.* The specification immediately and expressly contrasts that embodiment with another distinct embodiment in which the electric shield does rely on the electrical properties of the user's body because it is not sufficiently configured to do so without the user's body. *Id.*, (citing '075 patent at 7:56-61, 10:61-67).

The second limitation of claim 8 only reinforces that conclusion. A POSA would understand that the language "in the absence of human contact with the electric shield," in this context, indicates that electrical coupling between the human user and the electric shield is not required. EX2050, ¶44. As discussed regarding claim 7, the specification confirms that understanding by contrasting the first embodiment, in which the electric shield does not rely on the physical properties of the human to induce a touch event, and the second embodiment, in which it does rely on the physical properties of the human. *Id.*

Petitioner's interpretation of this claim as merely requiring that a human not have *direct physical* contact with the electric shield is illogical. As discussed above, the point of the embodiment to which this claim is directed is that the electrical shield **need not rely on the electrical properties of the human body** to induce a touch event. An electrical shield that relies on the human body (whether through direct or indirect physical contact) would not be sufficiently configured to induce a

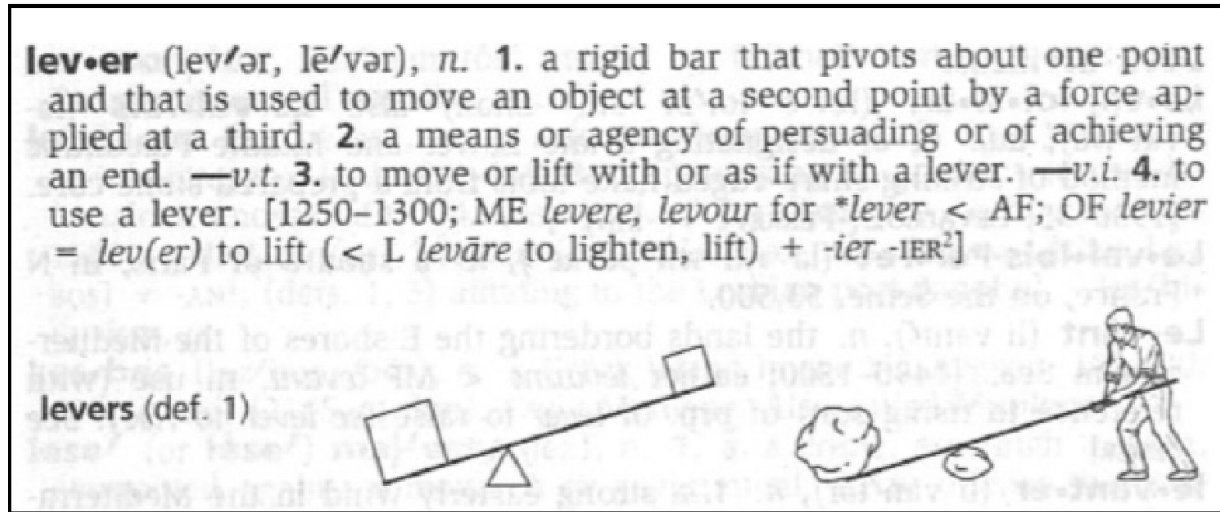
touch event and therefore would not satisfy the requirements of claim 8. EX2050, ¶45.

Thus, a POSA would understand that the electric shield of claim 8 must be sized to have sufficient capacitive properties such that contact between only the portion of the surface and the touch-screen can be detected by a capacitive touch-screen when the input mechanism is in the extended position, without relying on the electrical properties of other components or the human body. EX2050, ¶46.

C. Lever

Petitioner's proposed construction of "lever" ignores the common meaning of "lever" (as well as the specification's teaching) and instead relies on an out-of-context secondary definition from a present-day online dictionary. EX2050, ¶47.

Petitioner only cites one dictionary definition that was published before the priority date of the '075 patent. That dictionary, excerpted below, does not support Petitioner's desired construction, so Petitioner claims that definition is irrelevant to the patent's usage. EX2050, ¶48.



Ex. 1006, pg. 3 (Random House Webster's College Dictionary, pg. 764 (2000)).

Petitioner states that this definition “encompass[es] a long plank or bar that lifts heavy objects, which a POSA would understand is irrelevant to the patent’s usage.”

Petition at 27. While some levers may be used to lift heavy objects, nothing in this definition limits a lever to something only used to move a heavy object. EX2050, ¶48.

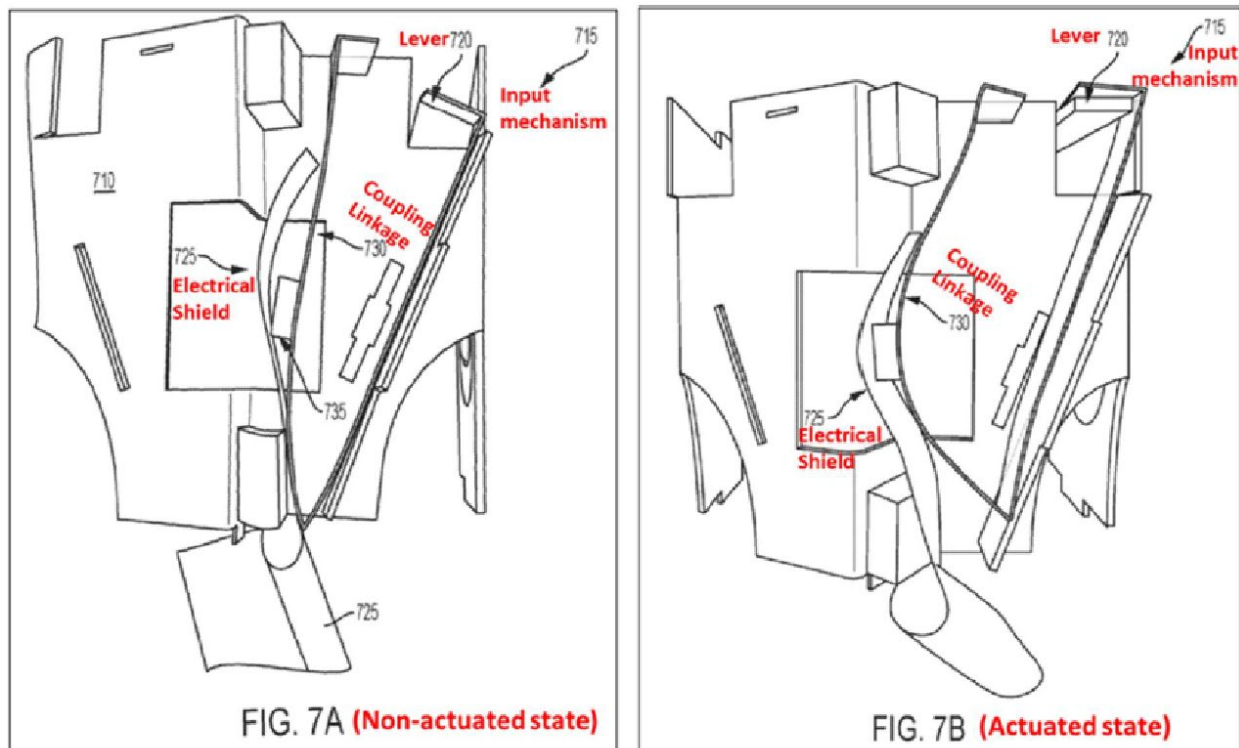
Moreover, the Webster's College Dictionary definition that Petitioner disregards is consistent with the definition from a technical dictionary published in 2013, shortly before the '075 patent's priority date. EX2050, ¶49. The Oxford Dictionary of Mechanical Engineering defines lever this way:

A stiff rod or beam pivoted about a fulcrum with a load at some point along the lever being moved by a force (effort) at a third point. There

are three classes of lever defined according to the relative positions of the effort, fulcrum, and load. For class 1, the effort and the load are on opposite sides of the fulcrum (as in a pair of pliers); for class 2, effort and load are on the same side of the fulcrum with the effort further away (as in a wheelbarrow); class 3 is like class 2, but with the load further away (as with tweezers). Classes 1 and 2 provide a mechanical advantage, but class 3 does not.

Id. (quoting EX2051, Oxford Dictionary of Mechanical Engineering at 203 (2013)).

The '075 patent provides an example of a lever that is consistent with these definitions, as illustrated in Figures 7A and 7B:



Ex. 1001, Figs. 7A & 7B (with Petitioner's annotations in red); EX2050, ¶50.

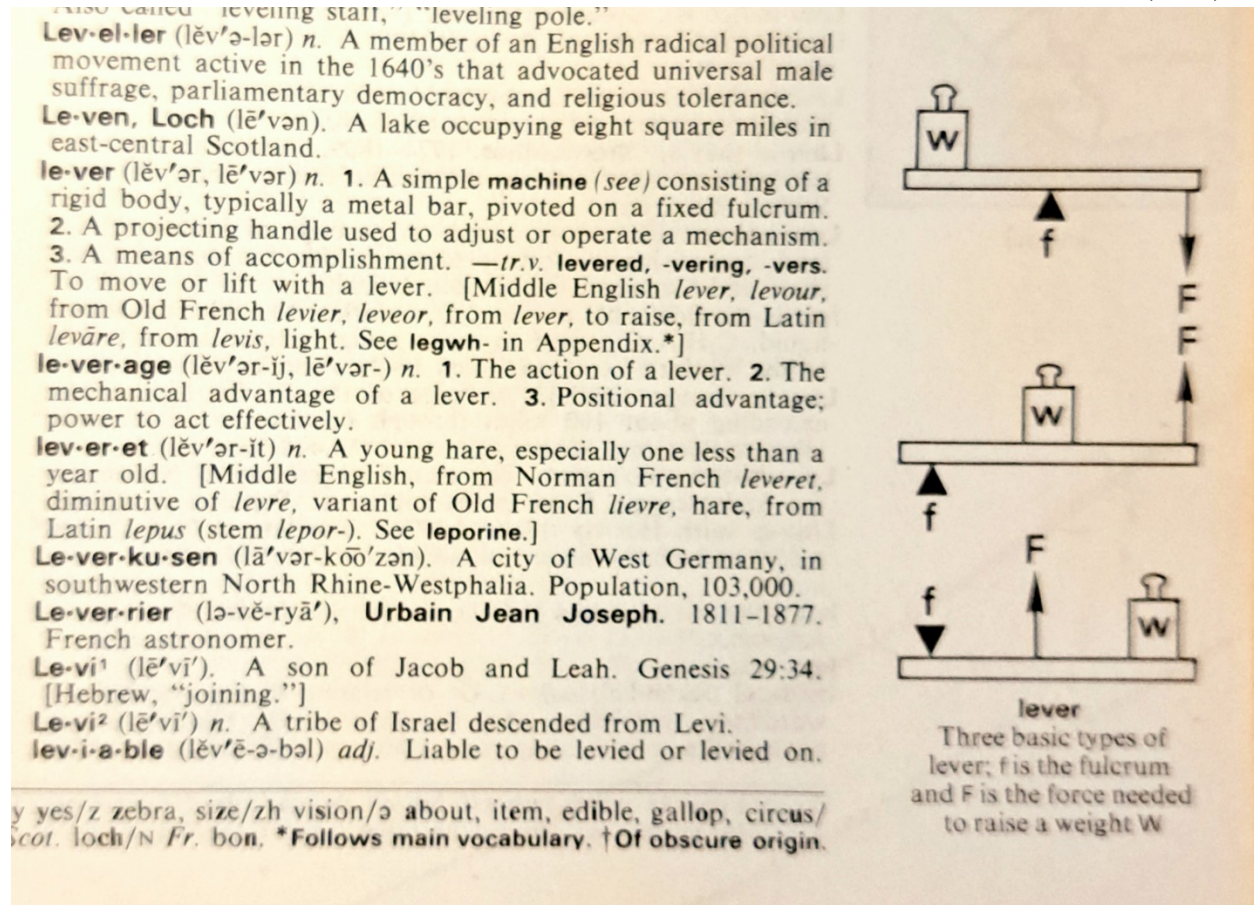
As shown here, when the user actuates the lever, the lever pivots, thereby causing the coupling 730 to deform and move the input mechanism towards the touchscreen. Ex. 1001, 7:62-8:10; EX2050, ¶50. This action of the lever is consistent with the definitions from both the Random House Webster's College Dictionary submitted by Petitioner and the Oxford Dictionary of Mechanical Engineering submitted by Patent Owner. EX2050, ¶50. In the words of the Oxford dictionary, the lever 720 is "pivoted about a fulcrum with a load [the flexible linkage coupled to the compressible pad and electric shield] at some point along the lever being moved by a force (effort) at a third point [the point where the user actuates the lever]." EX2050, ¶50.

Petitioner rejects this common meaning of "lever" because it does not fit with Petitioner's invalidity arguments. So instead, Petitioner relies on a secondary definition from an online dictionary and argues that it represents the ordinary meaning of "lever": "(b) a projecting piece by which a mechanism (see MECHANISM sense 1) is operated or adjusted." Petition at 18. Understood in the context of the full entry, this alternative phrasing is consistent with the



definitions cited above. For example, the lever shown at right is consistent with all of the definitions. EX2050, ¶51.

However, taking this secondary definition out of context, as Petitioner does in rejecting the primary definitions of “lever,” strips it of all meaning. EX2050, ¶52. Under Petitioner’s construction, any depressible button would constitute a lever. Petitioner’s expert conceded this seemed to be the case. EX2053, Keller Tr. at 97:1-98:10. That is not consistent with the ordinary meaning of the term, nor is it consistent with the usage of “lever” in the ’075 patent. EX2050, ¶52. This is made even more clear by dictionaries published before the filing of the ’075 patent that contain a secondary definition for lever similar to Petitioner’s online dictionary. *Id.* For example, the American Heritage Dictionary of the English Language provides the following definitions:



EX2052, The American Heritage Dictionary of the English Language, New College Edition, at 751 (1976).

Similar to the Webster's College Dictionary and the Oxford Dictionary of Mechanical Engineering, the primary definition involves a "rigid body . . . pivoted on a fixed fulcrum." The secondary definition, while similar to the secondary definition from Petitioner's online dictionary, provides more clarity in describing a "projecting *handle* used to adjust or operate a mechanism." This would describe the pull lever pictured above without encompassing any depressible button. EX2050, ¶53.

For the foregoing reasons, the Board should construe the term “lever” in accordance with its ordinary meaning as “a stiff body pivoted on a fulcrum,” which is consistent with the technical and general dictionary definitions cited above. EX2050, ¶54.

IV. Overview of the Prior Art

Kondo’s patent proposes a method of remote control for a “capacitive touch panel” (1506 in ¶0023) by “provid[ing] an attachment that achieves remote control input to a *touch panel mounted on* an electronic device.” (Kondo’s PROBLEM section; emphasis added). While Kondo identifies the type of touchscreen technology that is commonly used on smartphones as “projected-capacitive” (¶0024), the entire remainder of Kondo’s patent describes a design based on a different form of touchscreen technology, that of “surface-capacitive.” EX2050, ¶55.

This contention is supported in multiple ways throughout the patent. In ¶0024, Kondo describes how a capacitive touchscreen works, as follows:

The user touching the panel causes the human body (contact object) to act as the impedance imparting body (capacitor or the like capacitance). While in-phase and same-potential alternating currents are applied to the four corners of the touch panel 1506, when a finger or the like touches the touch panel 1506, the current changes in accordance with the impedance of the human body. Furthermore, the contact coordinates in

the coordinate system of the touch panel 1506 can be calculated from the ratio of the currents detected at the four corners.

EX1003, ¶0024. This is an accurate description of how a surface-capacitive touchscreen works. EX2050, ¶57. On the other hand, as Petitioner's expert acknowledged, it is not an accurate description of a projected-capacitive touchscreen. EX2053, 144:4-147:1.

In addition, Kondo refers to this current-based method of touch-location detection in ¶0048, as follows: "Therefore, the touch panel 1506 can detect a current value corresponding to this impedance and recognize that a touch operation has been performed at the virtual button positions W31 to W34." This is different from the touch-location method used in a projected-capacitive touchscreen, which is based on detecting a change in the mutual capacitance between multiple drive and sense (X-Y) electrodes. EX2050, ¶58. While Petitioner's expert was not familiar with surface-capacitive touchscreens (EX2053, 44:24-50:1), he did understand that Kondo's ¶0048 did not accurately describe a projected-capacitive touchscreen. EX2053, 58:22-62:17.

Kondo describes a surface-capacitive touchscreen, not a projected-capacitive touchscreen. EX2050, ¶59. A POSA in the field of touchscreens at the time of the '075 patent would be aware of these two distinct types of capacitive touchscreens

and would recognize Kondo's description as a surface-capacitive touchscreen. *Id.*

The POSA would get further verification of the touchscreen technology used in Kondo's patent from Kondo's emphasis on the need for protection against static electricity, which is unique to surface-capacitive touchscreens (projected-capacitive touchscreens do not have this issue). *Id.* This emphasis includes the following references:

- ¶0012: "...*static electricity* can be prevented from building up on the exterior, preventing malfunction of the remote touch circuit."
- ¶0033: Kondo expresses concern that a smartphone can be damaged by static electricity: "The device holding plate 44 is a plate material that secures the smartphone 1500, and is made of a material that is conductive or that dissipates *static electricity*."
- ¶0036: "The holding side ground circuit part 48 is a *static electricity* diffusion film attached to the inner surface of the recessed part 43, of which the tip end extends to the mating surface between the holding part 4 and the attachment main body 8. As long as the device holding plate 44 is secured to the cover part 42, the holding side ground circuit part 48 abuts on the outer surface of the device holding plate 44 and removes *static electricity* from the main body of the smartphone 1500 via the device holding plate 44."

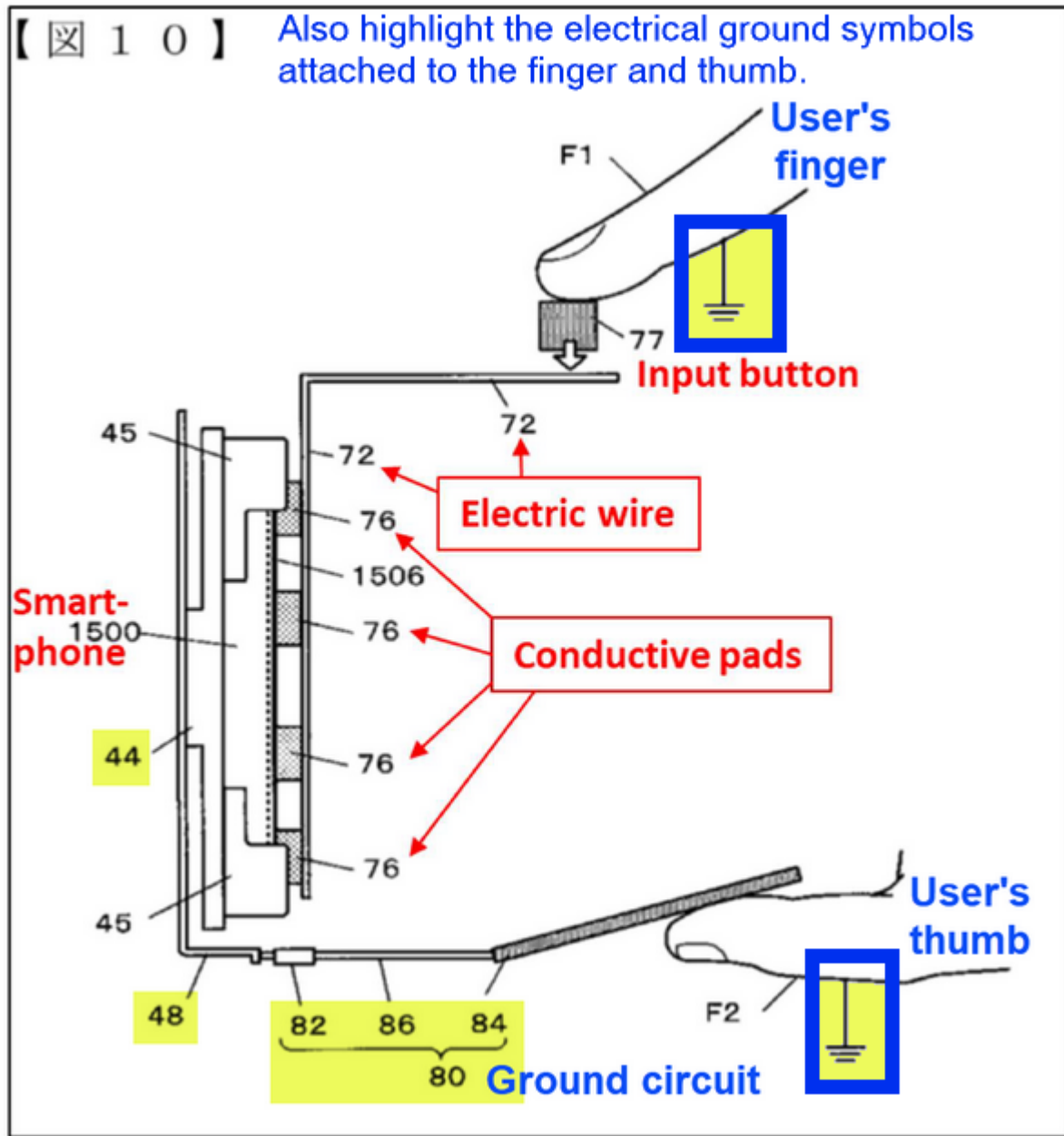
- In ¶0039, when describing the “electrical wire 72” (actually a flex cable) that connects the conductive pad 76 to the button 77, Kondo is again concerned about static electricity: “The electrical wire part 72 is formed by sealing conductive lines 74 formed of a material that is conductive or that dissipates *static electricity* on a flexible sheet 73 formed of an antistatic material with excellent bending properties.”
- In ¶0042, the plastic part that surrounds the button 77 (“gripping part 9”) is also described as being made of antistatic material: “Moreover, the gripping part 9 is made of a non-conductive *antistatic* material.”

EX2050, ¶59.

While Petitioner’s expert was not familiar with surface-capacitive touchscreens (and therefore did not understand why Kondo would be concerned with static electricity), he acknowledged confusion about why Kondo would be trying to reduce static electricity given his view that touchscreen technologies are “very resilient to static electricity.” EX2053, 57:21-58:16.

Yet another indication that Kondo designed his remote touch circuit around a surface-capacitive touchscreen can be found in his attempt to provide a reference ground for the user. EX2050, ¶61. Kondo describes a “ground circuit 80” (¶0038, illustrated in Figure 10, above) that in total is made up of the parts highlighted in

yellow in Figure 10:



EX1003, Fig 10 (red annotations by Petitioner, blue annotations and yellow highlights by Patent Owner); EX2050, ¶62.

The purpose of these parts is described in ¶0047, as follows: “When the holding part 4 is closed, *the main body of the smartphone 1500 is electrically conductively connected and grounded to the human body* that is the user through the device holding plate 44, holding side ground circuit 48, and attachment main body side ground circuit 80.” EX2050, ¶62 By providing an electrically conductive path between the hand (specifically, the thumb in ¶0046) of the human that’s holding the bottom part of the VR viewer and a conductive plate (44) holding the smartphone, Kondo describes a reference ground for the surface-capacitive touchscreen. *Id.*

One of the unique characteristics of a surface-capacitive touchscreen that differentiates it from projected-capacitive is its use of a low-impedance signal return path through the user’s finger back to the surface capacitive touchscreen’s signal reference. EX2050, ¶63. That signal reference is commonly called “reference ground” or “ground,” though it need not be a truly low-resistance connection to the earth. EX2050, *Id.* A stable reference ground is critically important in a surface-capacitive touchscreen because it establishes the baseline reference current for the “no-touch” condition. *Id.* Also, the human body capacitance (or electrically grounded stylus) that induces a touch in a surface-capacitive touchscreen is referenced to the touchscreen electrical ground, not some generalized earth ground or “rest-of-the-

world” ground. *Id.* This is a very different situation than in a projected-capacitive touchscreen, where the non-active electrodes provide a reference level for capacitive measurement of the active electrodes. *Id.* No “reference ground” is needed in a projected-capacitive touchscreen. *Id.* Petitioner’s expert acknowledged confusion as to why Kondo attempted to provide a ground in this manner. EX2053, 64:4-66:10. His confusion was because he was not familiar with the type of surface-capacitive touchscreen Kondo describes.

As any smartphone user in 2014 would know, the touchscreen of a smartphone works whether the user is gripping the phone chassis with one hand and touching the touchscreen with one finger of the other hand, or touching the screen with only one fingertip. EX2050, ¶64. A typical phone user would also know that the touchscreen operates whether the user is grounded, or if they are not grounded (*e.g.*, sitting in a plastic chair). A POSA would also know what the lay user knows in this case. *Id.*

A POSA would have known with certainty that it was not possible to integrate a surface-capacitive touchscreen into a mobile consumer-electronics device such as a smartphone. EX2050, ¶65. All smartphones capable of providing display capability sufficient for use in a VR viewer at that time used projected-capacitive touchscreens. *Id.* A POSA at that time who was considering combining Kondo’s and Chu’s patents would therefore be faced with combining designs created for two different and

incompatible touchscreen technologies. *Id.* This would significantly increase the difficulty and decrease the likelihood of the combination being achieved. *Id.*

V. Kondo and Chu Do Not Render the Challenged Claims Obvious

A. Claim 1

A POSA would not have been motivated to combine Kondo with Chu as Petitioner proposes. EX2050, ¶66.

As described above, a POSA would understand that Kondo's touch panel 1506 is a surface-capacitive touchscreen. A POSA would know that a surface-capacitive touchscreen such as Kondo's touch panel 1506 would not be used in personal mobile devices. Because of the electrical requirements of both the touchscreen and the control circuit, there would be no reason for a POSA to create a surface-capacitive touchscreen that would fit within and be powered by a personal mobile device. *Id.*, ¶67.

Moreover, it would not be clear to a POSA that Kondo's design would work with a surface-capacitive touchscreen because the total impedance between the human-touchable button and the conductive pad that touches the touchscreen may be so high that insufficient capacitive coupling from the user is provided to register as a touch. EX2050, ¶68. Since surface-capacitive technology is typically used in ATMs, ticketing machines, kiosks, point-of-sale terminals, arcade games, and factory

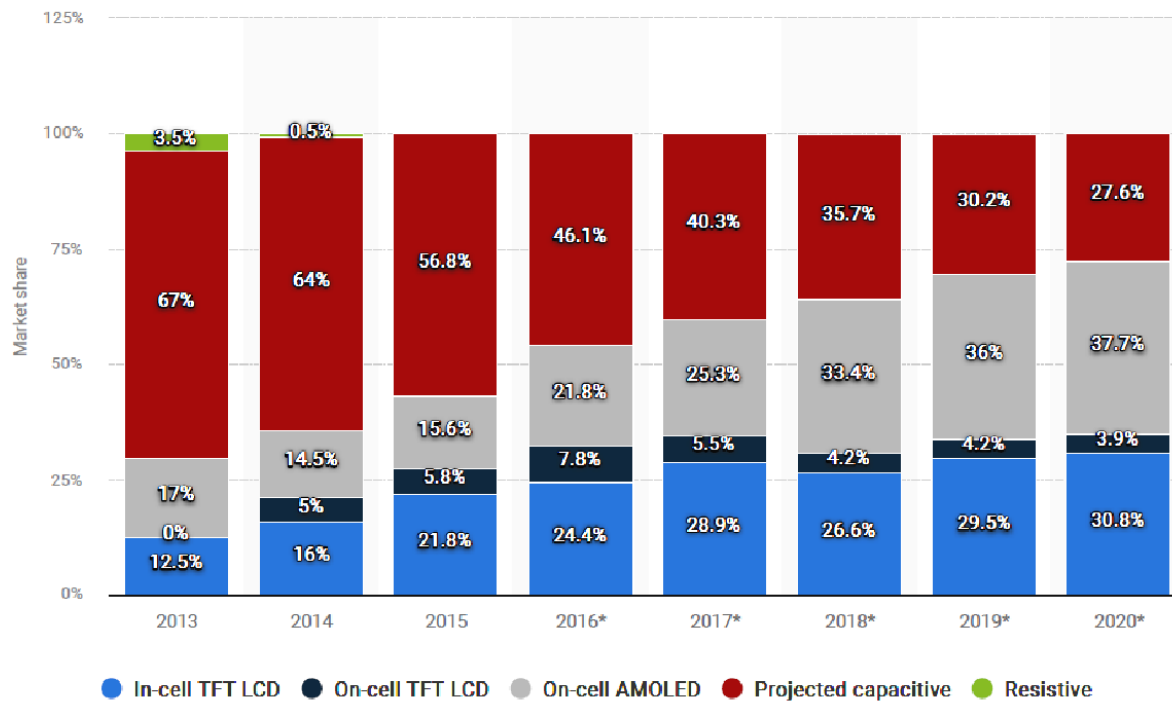
automation applications (all devices that are designed for a user to directly contact the screen with exactly one finger or stylus), there was no demand for *remote*-touch capability for surface-capacitive screens. *Id.* A POSA would not have been motivated to utilize Kondo's surface-capacitive touch panel 1506 as the mobile device recited in the challenged claims of the '075 patent. *Id.* The inability of surface-capacitive touchscreens to identify and report two touch events makes them unsuitable for use in multi-touch user interfaces. *Id.* Practically all smartphones in 2014 were based on multi-touch user interfaces (*e.g.*, those utilizing projected-capacitive touchscreens). *Id.* A POSA would not have been motivated to utilize Kondo's surface-capacitive touch panel 1506 as the mobile device recited in the challenged claims of the '075 patent. *Id.*

Petitioner's proposed combination also fails for additional reasons. Kondo only discloses embodiments in which the touch pads are in constant contact with the touchscreen after insertion of the touchscreen device into the headset. EX2050, ¶69. A POSA who understands that Kondo teaches a surface-capacitive touchscreen would have no particular motivation to change Kondo's input mechanism to a non-contact system like Chu. *Id.* In fact, a POSA would be motivated against modifying Kondo in that way because adding moving parts would make the remote touch system more complicated and expensive for no technical or user benefit. It would

cost more and be less reliable. *Id.* For this additional reason, a POSA would not have been motivated to modify Kondo in the manner Petitioner proposes. *Id.*

Petitioner asserts that a POSA would have been motivated to modify Kondo to use Chu's input mechanism so that it would work with resistive touchscreens. However, Kondo makes no mention of resistive touchscreens, and a POSA would also have known that, at the time of the invention of the '075 patent, resistive touchscreens comprised little, if any, market share. EX2050, ¶70. In 2013 only 3.5% of mobile phones used resistive touchscreens and by 2015 none did. EX2046; EX2050, ¶70.

Market share of mobile phone touch screens worldwide from 2013 to 2020, by technology



EX2046.

What few resistive touchscreens were available on the market were used on low-cost mobile devices that would not have had the graphic processing power or display resolution that was necessary for a mobile device to be used with a VR headset, further evidencing the complete lack of motivation to combine. EX2050, ¶71. One VR viewer for use with smartphones was the Durovis Dive. EX2050, ¶71. A webpage for the Durovis Dive 5 lists compatible phones. EX2064. Publicly available information about the phones released in 2014 or earlier indicates that none

used resistive touchscreens. EX2050, ¶71; EX2065. Indeed, Google’s own Android specification from 2016-2017 sets forth specific hardware requirements for a smartphone to be VR ready, all of which were completely incompatible with resistive touchscreens at the time. EX2050, ¶71; EX2048 at 74-75.

In EX2046, “in-cell” and “on-cell” refer to the location of the projected capacitance sensor electrodes within the display-touchscreen stack. EX2050, ¶72. The red category is discrete projected capacitive sensors, in which the touch sensor is manufactured separately from the display. *Id.* All of the categories except “Resistive” are types of projected-capacitive touchscreen constructions. *Id.*

A further reason for avoiding the use of resistive touchscreens is their poor optical properties. EX2050, ¶73. A resistive touchscreen has an air gap between two conductive layers. *Id.* A touch is indicated by bringing those two layers into contact with one another, making an electrical connection. *Id.* Optically, this is two partial mirrors facing each other with a variable gap between them. *Id.* Light bounces back and forth in this gap, creating offset images that interfere with the image from the display. *Id.* In a virtual reality viewer, stereoimaging relies on slightly offset images to convey 3-dimensional depth information to the user. *Id.* The images being further offset by the gap present in a resistive touchscreen would disrupt the ability to properly convey the 3D stereo image. *Id.* A POSA with experience in the field of

optics, as Petitioner proposes, would reject the resistive touchscreen, and therefore would not consider the resistive touchscreen relevant for the claimed inventions. *Id.*

Resistive touchscreens, like surface-capacitive touchscreens, are designed to process a single input location. EX2050, ¶74. They are not able to process multi-touch gestures. *Id.* Starting in 2007 (and continuing to present), multi-touch capability has been a requirement for use in smartphones, particularly those using the Apple iOS and Google Android operating systems, which have dominated the consumer market. *Id.* Without the ability to process multi-touch gestures, resistive and surface-capacitive touchscreens would be able to support only one user input at a time. *Id.* A POSA seeking to enable more than one touch control in a VR viewer based on a smartphone would reject resistive and surface-capacitive touchscreens. *Id.*

In other words, while surface-capacitive and resistive touchscreens were generally known, the smartphone market was entirely dominated by projected capacitive touchscreens, almost to the complete exclusion of resistive touchscreens (with those limited resistive touchscreen devices incapable of operating for purposes of virtual reality viewing). EX2050, ¶75. Adding a resistive touchscreen to a smartphone was not simply a matter of switching out one comparable technology for another; it was directly contrary to the accepted approach of the entire market segment. *Id.* Given this landscape, a POSA in 2014 would have had no reason to

consider resistive touchscreens at all. *Id.* Thus, a POSA seeking to use touchscreen-enabled mobile devices in 2014 would not be motivated to consider a resistive or surface-capacitive touchscreen for use in a VR viewer based on a smartphone. *Id.*

Because Petitioner fails to show motivation to combine Kondo and Chu in the manner proposed, it has failed to carry its burden in demonstrating that claim 1 is obvious.

B. Claim 2

Claim 2 depends from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶76.

C. Claim 3

Claim 3 depends from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶77.

D. Claim 4

Claim 4 depends indirectly from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶78.

E. Claim 5

Claim 5 depends from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶79.

F. Claim 6

Claim 6 depends from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶80.

G. Claim 7

Claim 7 depends indirectly from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶81.

Further, as discussed above in the Claim Construction section, a POSA reading claim 7 in the context of the specification would understand that the electric shield of claim 7 must be sized to have electrical properties that are sufficient to be detected by the touch-screen based on capacitance when the input mechanism is in the extended position and only the portion of the surface is contacting the touch-screen, **without relying on the electrical properties of other components or the human body.**

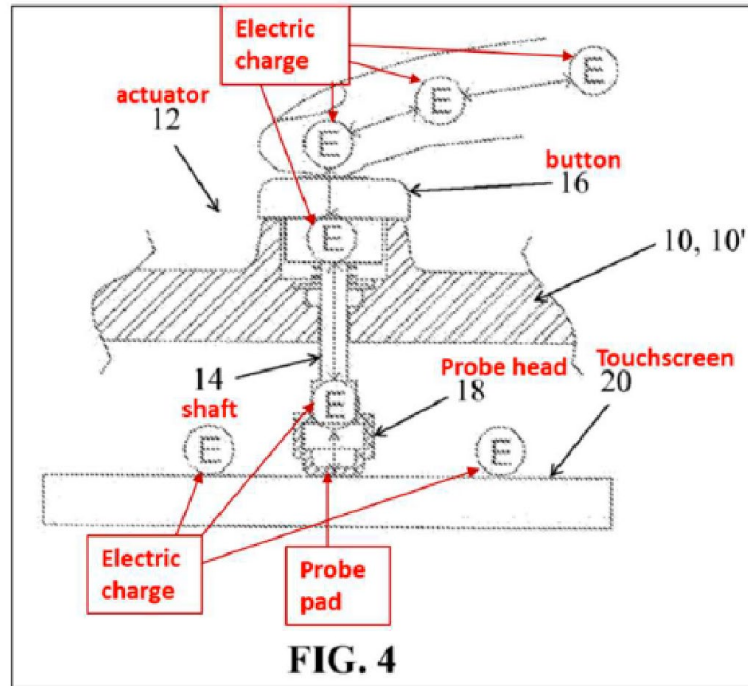
Petitioner provides no analysis of claim 7 specifically. Petition at 83. Petitioner's analysis of claim 1, in discussing the electrical shield, asserts that "the combinations of Kondo/Chu proposed above in §XI(C) would use Chu's input mechanism to contact the central region of Kondo's touchscreen." Petition at 61. Petitioner goes on to state that "the electrical shield (Chu's probe pad 30) in the Kondo/Chu combination would contact the central region of the smartphone's touchscreen when the input mechanism is in an extended position." Petition at 65.

However, as Petitioner acknowledges, Chu's probe pad is not itself sufficient to induce a touch event; instead, it **relies on the electrical properties of the human body to induce a touch event:**

FIG. 4 shows the actuator mechanism 12 at an actuation position when the press button 16 is pushed downwards/inwards by a finger of a user, and the probe head 18 is touching the capacitive touch screen 20. *At this actuation position, electric charge E can be transferred between the finger of the user and the capacitive touch screen 20 through the press button 16, the actuator shaft 14 and the probe head 18,* as shown by the arrows.

Ex. 1004, ¶ 0041 (emphasis added); EX2050, ¶83.

This is further demonstrated in Petitioner's annotated version of Chu's Figure 4, in which Petitioner labels the "Electric charge" transferred from the user's finger through the probe pad 30 to induce a touch event:



Petition at 60 (reproducing Ex. 1004 Fig. 4 with Petitioner's annotations in red); EX2050, ¶84. Therefore, Petitioner has failed to show that the requirements of claim 7 are found in Kondo or Chu. *Id.* Thus, the combination of Kondo and Chu does not render obvious the additional recitations of claim 7. *Id.*

H. Claim 8

Claim 8 depends indirectly from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1.

Further, as discussed in the Claim Construction section, a POSA would understand that the electric shield of claim 8 must be sized to have sufficient capacitive properties such that contact between only the portion of the surface of the

electric shield and the touch-screen can be detected by a capacitive touch-screen when the input mechanism is in the extended position, **without relying on the electrical properties of other components or the human body**. Petitioner's argument on claim 8 relies on the same incorrect analysis as its argument for claim 7. That interpretation is incorrect for the reasons discussed above, and therefore Petitioner's argument fails for the same reasons discussed regarding claim 7. EX2050, ¶87.

Petitioner's alternative argument relying on the embodiment of Kondo disclosing the use of a capacitive element also falls short. EX2050, ¶88. In that embodiment of Kondo, the button "can be configured to connect to a capacitive element instead of the human body." Specifically, Kondo says, "Connect a first terminal of the capacitive element 11 to the attachment main body side ground circuit 80, and connect the second terminal to the button part 77. Furthermore, the button part 77 can be configured to connect the second terminal of the capacitive element 11 to the conductive line 74 when the button part is pressed." Petition at 84. Petitioner does not explain how it proposes to modify its combination of Kondo's housing and Chu's input mechanism to incorporate this capacitive element. EX2050, ¶89. For example, Chu's input mechanism does not have any equivalent of Kondo's "main body ground circuit 80," so there's nothing to connect the capacitive element to. *Id.*

In any case, the use of Kondo's capacitive element would not satisfy the recitations of claim 8. EX2050, ¶90. The very reason for Kondo's alternative embodiment using the capacitive element is that Kondo does not disclose an electrical shield having sufficient capacitive properties to induce a touch event in the absence of a human. *Id.* Thus, Kondo does not disclose that its touch pad 76, which Petitioner calls it an electrical shield (Petition at 85), is sufficient to induce a touch event. If it were, then the capacitive element would not be necessary. *Id.* Thus, the introduction of Kondo's capacitive element into Petitioner's proposed combination would not satisfy the additional recitations of claim 8; this claim element is completely missing from Kondo and Chu. *Id.*

I. Claim 9

Claim 9 depends from claim 8 and Petitioner therefore fails to establish obviousness for the same reasons as claim 8. EX2050, ¶91.

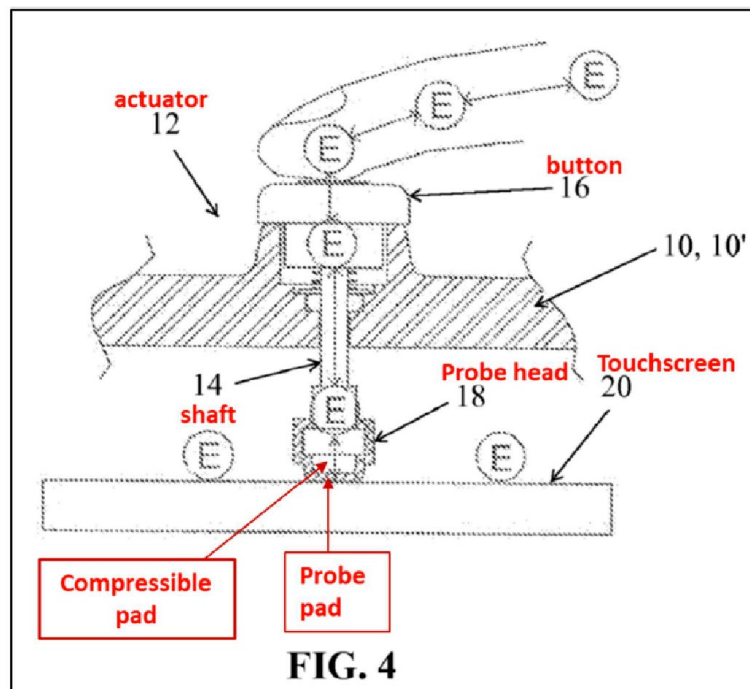
J. Claim 10

Claim 10 depends indirectly from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶92.

Additionally, claim 10 recites, "The virtual reality viewer of claim 6, further comprising a compressible pad disposed between the second portion of the input mechanism and the portion of the surface of the electric shield, wherein the pad is

configured to create a sufficiently sized area of contact between the portion of the surface and the touch-screen when the input mechanism is in the extended position.”

As discussed above, Petitioner argues that Chu’s probe pad 30 is the recited electrical shield. Petitioner argues that Chu also includes additional “padding” in the white space behind probe pad 30 that is shown in Chu’s Figures 4 and 5. Petitioner states that Chu “indicates to a POSA that there is a substantial thickness to the probe pad and it is not empty,” providing the following annotated version of Chu’s Fig. 4 labeling the white space behind probe pad 30 as a compressible pad:



Petition at 90 (Ex. 1004, Fig. 4 with Petitioner’s annotations in red).

Petitioner is reading disclosure into Chu that is not there. EX2050, ¶95. First, a POSA would understand that the white space behind probe pad 30 is not part of probe pad 30. EX2050, ¶96. Chu's Fig. 5 is a cross-sectional view that uses cross-hatching to illustrate the area of probe pad 30. That cross-hatching distinguishes probe pad 30 from the white space. (Chu's Figs. 3, 4, and 9a are similar.) Thus, a POSA would understand that the white space is not part of probe pad 30. EX2050, ¶96.

Second, nothing in Chu would indicate that there is separate padding in the empty space behind probe pad 30. EX2050, ¶97. Chu's figures do not label this area. Nor does Chu's specification indicate that there is padding or anything else in this white space. Thus, a POSA would understand that this space is empty. *Id.* A POSA would find this consistent with the state of the art at the relevant time. *Id.* Chu's probe pad 30 is very similar to the rubber tips found on passive styluses, such as the one pictured below made by CoAsia in Taiwan in around 2012. *Id.* Such styluses did not have padding underneath the rubber tip, and a POSA would not expect Chu's similar probe pad to include padding either. *Id.*



Petitioner argues that the arrows in Chu's Fig. 4 showing a flow of electric charge between the touch screen and the user's finger indicate to a POSA that the white space is not empty and instead includes a compressible pad. Petitioner puts far more weight on the arrows showing the flow of electric charge than would a POSA, especially since Chu does not label this space or otherwise state that it includes any component, let alone a "compressible pad." EX2050, ¶98.

First, a POSA would understand that Chu's use of the "electric charge E" labels is not accurate. EX2050, ¶99. There is no "charge transferred" as Chu states in ¶0041 describing the "electric charge E" labels in Fig. 4. In touchscreens like that disclosed in Chu, there is "polarization" current but no electrical charge transfer between the touchscreen and the finger. *Id.* "Polarization" is a convention to treat electric fields as if they were actual currents, but in reality the charge carriers (electrons) only move ~0.1 nm or less. *Id.* That's less than one millionth of the distance from the finger to the touchscreen electrodes. Thus, a POSA would not accept Petitioner's conclusion that Chu's Fig. 4 means electric charge is being transferred between the touchscreen and the user's finger and would certainly not assume there must be padding in the white space behind probe pad 30. EX2050, ¶99.

Rather, a POSA would understand that what Chu intended to convey is that the probe pad 30 is electrically coupled to the button 16, such that when a user touches

button 16, the electrical properties of the user's body may induce a touch event.

EX2050, ¶100. And a POSA would understand that no conductive padding behind probe pad 30 is required for such electrical coupling between probe pad 30 and button 16. Chu describes Fig. 4 in this way:

FIG. 4 shows the actuator mechanism 12 at an actuation position when the press button 16 is pushed downwards/inwards by a finger of a user, and the probe head 18 is touching the capacitive touch screen 20. At this actuation position, electric charge E can be transferred between the finger of the user and the capacitive touch screen 20 through the press button 16, the actuator shaft 14 and the probe head 18, as shown by the arrows.

EX1004, ¶0041. This passage indicates that the arrows are intended to show electrical coupling between the touchscreen 20 through the probe head 18 to the actuator shaft 14 to the button 16 to the user's finger. EX2050, ¶100.

Chu's Fig. 5 shows that the probe head 18 is made up of probe pad 30 and sleeve 28. EX1004, Fig. 5, ¶0048 ("the probe head 18 may include an adaptor in the form of a sleeve 28 and a probe pad 30 for direct contact with the touch screen 20."). Chu states that "[t]he sleeve 28 may be mounted on the inner end of the actuator shaft 14 and the probe pad 30 can be mounted on an enlarged free end of the sleeve 28." EX1004, ¶0048. Chu discloses that the press button, the shaft, and the probe

head (including the sleeve) may be made of metal. EX1004, ¶0014. A POSA would understand that this would permit electrical coupling between the touchscreen and the user's finger. EX2050, ¶101. Thus, based on Chu's description of Fig. 4 in ¶0041, a POSA would understand that electric field is coupled from the touchscreen to probe pad 30, to sleeve 28 (part of probe head 18, as shown in Fig. 5), to shaft 14, to button 16, and to the user. EX2050, ¶101. A POSA would therefore not understand that the white space behind probe pad 30 includes conductive padding, as Petitioner argues (EX1002, ¶38). *Id.*

There is no merit to Petitioner's alternative argument that "even if there weren't such padding, a POSA would be motivated to add it for more of a cushioning effect against the touchscreen and increased conductivity because it would be made of conductive rubber." EX2050, ¶102 (quoting Petition at 91-92). As explained above, Chu's probe pad 30 is similar to the rubber tip used by passive styluses. A POSA would therefore not be motivated to do anything different than was done by passive styluses at the time (which did not include a compressible pad behind the rubber tip). EX2050, ¶102. Adding additional conductive padding would actually make it harder to deform the probe pad, leading to an undesirable user experience. *Id.* Thus, it is unsurprising that Chu makes no mention of a need for more cushioning effect. Chu's deformable probe pad would provide sufficient cushioning. *Id.*

Moreover, contrary to Petitioner's assertion, adding additional conductive rubber under the probe pad would not provide "increased conductivity" from the point of view of the touchscreen. EX2050, ¶103. The amount of capacitive coupling seen by the touchscreen is determined by the area of touch contact, not the amount of conductive rubber above the contact area. *Id.* Adding more conductive rubber under the probe pad would actually have two negative effects. First, it would likely decrease the amount of deformation undergone by the probe pad. This would decrease the conductive area seen by the touchscreen, which would in turn decrease the reliability of the touch event. *Id.* Second, it would increase the total electrical resistance between the probe pad and the human's finger, potentially decreasing the "electric charge transfer performance" (Ex. 1004, ¶0049). This would also decrease the reliability of the touch event. EX2050, ¶103. Due to these potentially negative effects, a POSA would not have a reasonable expectation of success, but instead would be concerned that adding more conductive rubber might not be successful. *Id.*

Thus, Petitioner fails to show that the additional recitations of claim 10 are obvious.

K. Claim 11

Claim 11 depends from claim 10 and Petitioner therefore fails to establish obviousness for the same reasons as claim 10. EX2050, ¶104.

Additionally, claim 11 recites, “The virtual reality viewer of claim 10, wherein the pad is configured to vary the size of the area of contact between the portion of the surface of the electric shield and the touch-screen as a function of a force applied to the input mechanism from the exterior of the housing.” Chu teaches that the deformation of probe pad 30 (which Petitioner treats as the recited electric shield) is caused by the probe pad 30 pressing against the touch screen. Ex. 1004, ¶0055. It does not attribute deformation of the probe pad 30 to some compressible pad (indeed, Chu does not disclose the use of a compressible pad). EX2050, ¶105. For this additional reason, Petitioner fails to show claim 12 was obvious.

L. Claim 12

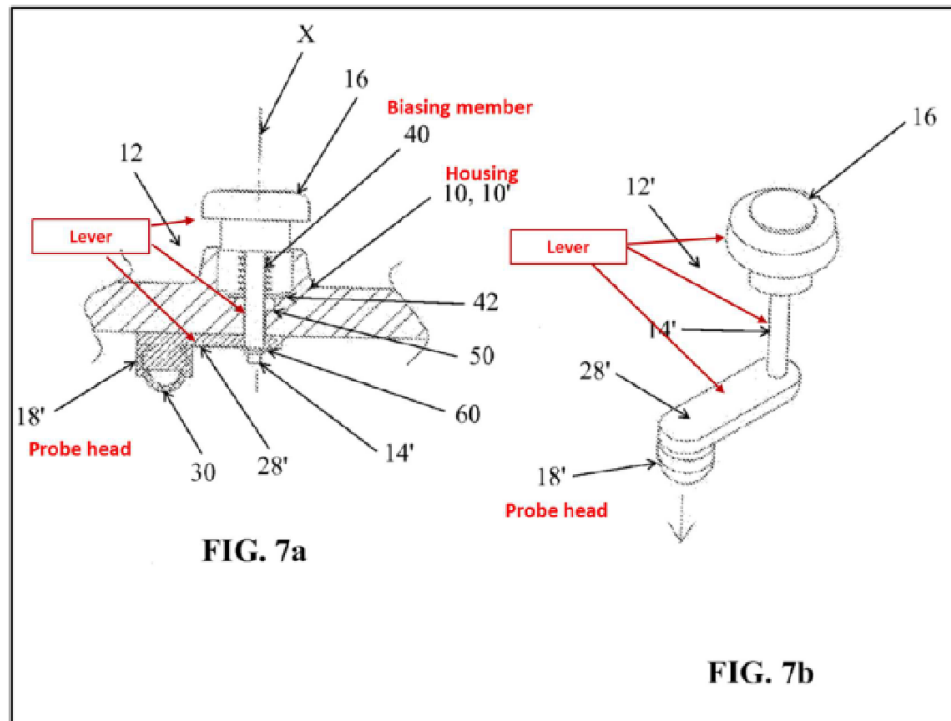
Claim 12 depends from claim 1 and Petitioner therefore fails to establish obviousness for the same reasons as claim 1. EX2050, ¶106.

Additionally, claim 12 recites, “The virtual reality viewer of claim 1, wherein the input mechanism includes a lever and a flexible linkage coupled to the housing, wherein the flexible linkage is configured to deform when the lever is actuated and thereby guide at least the portion of the surface between the first position and the extended position.” Petitioner fails to show that the proposed combination of Kondo and Chu satisfies the additional recitations of claim 12. EX2050, ¶106.

First, the proposed combination does not include the recited flexible linkage.

EX2050, ¶108. Petitioner's argument that Chu's biasing member 40, which Petitioner characterizes as a spring/coil structure, fails to satisfy all the requirements relating to the flexible linkage in claim 12. As Petitioner notes, when button 16 is pressed, "[t]he biasing member 40 is compressed." Petition at 98 (quoting Ex. 1004, ¶10055). However, contrary to Petitioner's assertion, nothing in Chu's Figures 7A or 7B shows that the biasing member 40 is coupled to the housing. EX2050, ¶109. There is no reason why it could not simply be resting within the housing, as a spring is often placed inside a retractable ballpoint pen without being coupled to the housing of the pen. *Id.*

Moreover, the biasing member 40 does not "guide at least the portion of the surface [of the electric shield] between the first position and the extended position." Biasing member 40 does not guide Chu's probe pad 30 (which Petitioner treats as the electric shield) between a first position and an extended position. EX2050, ¶110. It actually does the opposite, resisting movement of the probe pad 30 to the extended position. *Id.* Petitioner's assertion to the contrary is unsupported and conflicts with Chu's figures and description, as evident from Chu's Figures 7A and 7B:



Petition at 97 (Ex. 1004, Figs. 7A & 7B with Petitioner's annotations in red);

EX2050, ¶110.

Second, the proposed combination does not teach or render obvious the recited lever. EX2050, ¶111. Petitioner's argument that Chu discloses a lever is based on its flawed construction of lever as merely "a projecting piece by which a mechanism is operated or adjusted." *Id.* As explained above, the proper construction of "lever" is a stiff body pivoted on a fulcrum. *Id.*

When the motion of an object is a pure translation, with no rotation, there is no fulcrum and no lever. EX2050, ¶112. There is no "leverage" in the common sense of the word, as the force to actuate a button is the same throughout the button

mechanism. *Id.* Chu's specification describes how to ensure that the button mechanism allows only linear translation with no rotation. *Id.*

Petitioner argues that Chu's button 16, shaft 14 and extension arm 28' together constitute the claimed lever "because it projects from housing 10 and operates the VR viewer." Petition at 96. This is incorrect because the whole point of Chu's mechanism is to *avoid* any pivoting about a point. EX2050, ¶113. While the extension arm 28' allows the probe head to be offset from the actuator shaft (Ex. 1004, ¶0057), Chu makes clear that there is to be no rotation in this mechanism. EX2050, ¶113. Indeed, to ensure that there is no rotation, Chu teaches that "[i]n order to prevent the extension arm 28' from swinging or rotating about the actuator shaft 14 which may result in the probe head 18 probing at the wrong location on the touch screen 20, one or more posts or guides (not shown) may be provided along the sides of the extension arm 28'. This allows the probe head 18' to moves [*sic*] only vertically up or down." Ex. 1004, ¶0059. Thus, Chu's button 16, shaft 14 and extension arm 28' do not constitute the claimed lever. Petitioner's alternative position that the shaft 14 and extension arm 28' alone would constitute the lever fails for the same reason. EX2050, ¶113.

Petitioner's next alternative argument that it would have been obvious to replace Chu's button with a handle also fails. EX2050, ¶114. Even if simply

replacing a button with a handle transformed it into a lever (which Petitioner does not explain), Petitioner does not establish that a POSA would have been motivated to replace Chu's button with a handle. *Id.* Chu explains that the button 16 "may be in the shape of a mushroom or flat head such that it is comfortable for a user to press with a finger or hand." Ex. 1004, ¶0043. Thus, Chu provides a specific reason for the shape of its button. Contrary to Petitioner's suggestion, Chu teaches that its disclosed shape is well-suited to Chu's purpose. EX2050, ¶114. Moreover, if the button was replaced with a handle, it would make it more likely that depressing it would result in "swinging or rotating about the actuator shaft," which Chu teaches should be avoided. Ex. 1004, ¶0059. Thus, a POSA would not have been motivated to replace Chu's button with a handle. EX2050, ¶114.

Petitioner therefore fails to show that the additional recitations of claim 12 were obvious.

M. Claim 14

Claim 14 depends from claim 12 and Petitioner therefore fails to establish obviousness for the same reasons as claim 12. EX2050, ¶115.

N. Claim 18

1. Petitioner Incorrectly Argues that Claim 18 Cannot be Understood

Contrary to Petitioner's assertion, claim 18 includes no inconsistencies or ambiguities rendering it unable to be understood. EX2050, ¶116. As it relates to Petitioner's assertion, claim 18 recites an "input device" including "a first portion that is accessible from an exterior of the housing, and an elongate second portion disposed within the interior of the housing between the left and right regions wherein the second portion is generally oriented in a vertical direction that is perpendicular to the horizontal direction." Claim 18 also recites "an electric shield" wherein "a first surface of the electric shield is disposed on the first portion and is electrically coupled to a second surface of the electric shield" and "wherein the second surface is disposed on the second portion within the interior and is generally centered in the horizontal direction between the left and right regions, and wherein only the second surface of the electric shield is configured to contact a central portion of the touch-screen."

In short, claim 18 recites an input device with a first portion and a second portion. The first portion is accessible to the user from the exterior of the housing. In other words, the first portion of the input device is what the user touches to initiate a

touch event. The claim also recites an electric shield with a first surface and a second surface. The electric shield's second surface is disposed on the second portion of the input device so as to contact the touchscreen when the input device is actuated. The electric shield's first surface is disposed on the input device's first portion (the portion of the input device that the user actuates). EX2050, ¶117.

The '075 patent describes an embodiment consistent with this claim language, in which the electric shield not only contacts the touchscreen but also includes an exposed portion disposed on the user input that the user touches when actuating the input: "In addition or alternatively, the portion of the metallized film¹ that is configured to touch the screen can be accessible to receiving a user touch. For instance, a portion of the metallized film can be exposed on the lever 722 or otherwise accessible to the user on an external surface." EX1001, 10:67-11:4; EX2050, ¶118.

Petitioner's argument that claim 18 is confusing or internally inconsistent appears to depend on its expert's understanding that claim 18 requires the second surface of the electric shield *face* the second portion of the input device: "Because

¹ The preceding sentence refers to the metallized film as element 725, which element number is elsewhere used for the electric shield as element 725. EX1001, 7:18.

the second surface is facing and disposed on the second portion, it does not seem apparent how it could also touch the touchscreen as the claim requires.” EX1002,

¶158. Claim 18 includes no requirement that the second surface of the electric shield *face* the second portion of the input device, nor does it require that the first surface of the electric shield *face* the first portion of the input device. EX2050, ¶120. When Petitioner’s expert was asked during his deposition about these statements in his declaration, he was unable to point to anything in claim 18 supporting his interpretation. EX2053 at 151:1-160:18. In fact, Petitioner’s expert had a great deal of difficulty understanding his own declaration on this issue. *Id.*

Petitioner’s expert also attempts to support his contention that claim 11 is confusing by attempting to map claim 18 to the embodiment illustrated in Fig. 7A of the ’075 patent. But Fig. 7A shows a *different* embodiment than the one to which claim 18 is directed. EX2050, ¶121. As noted above, the embodiment corresponding to claim 18 is introduced with the phrase “[i]n addition or alternatively.” EX1001, 10:67. This plainly indicates that this passage describes an additional/alternative embodiment; it is not the only embodiment disclosed in the ’075 patent. Moreover, nothing in the ’075 patent indicates that Fig. 7A is intended to illustrate the embodiment described at col. 10, line 67 through col. 11, line 4. EX2050, ¶121.

Therefore, the fact that Petitioner's expert struggled to map the language of claim 18 onto Fig. 7A does not show that claim 18 is somehow internally inconsistent. *Id.*

Petitioner relies on its expert's flawed analysis to argue that the phrase "disposed on" should be rewritten "to include an indirect connection." EX1002, ¶160. Petitioner does not argue that this is the ordinary meaning of the phrase "disposed on." Its only justification for this interpretation is that it is "[t]he only way it could possibly make sense." *Id.* For the reasons discussed above, claim 18 is not internally inconsistent, so Petitioner's interpretation is unnecessary and should be rejected. EX2050, ¶122.

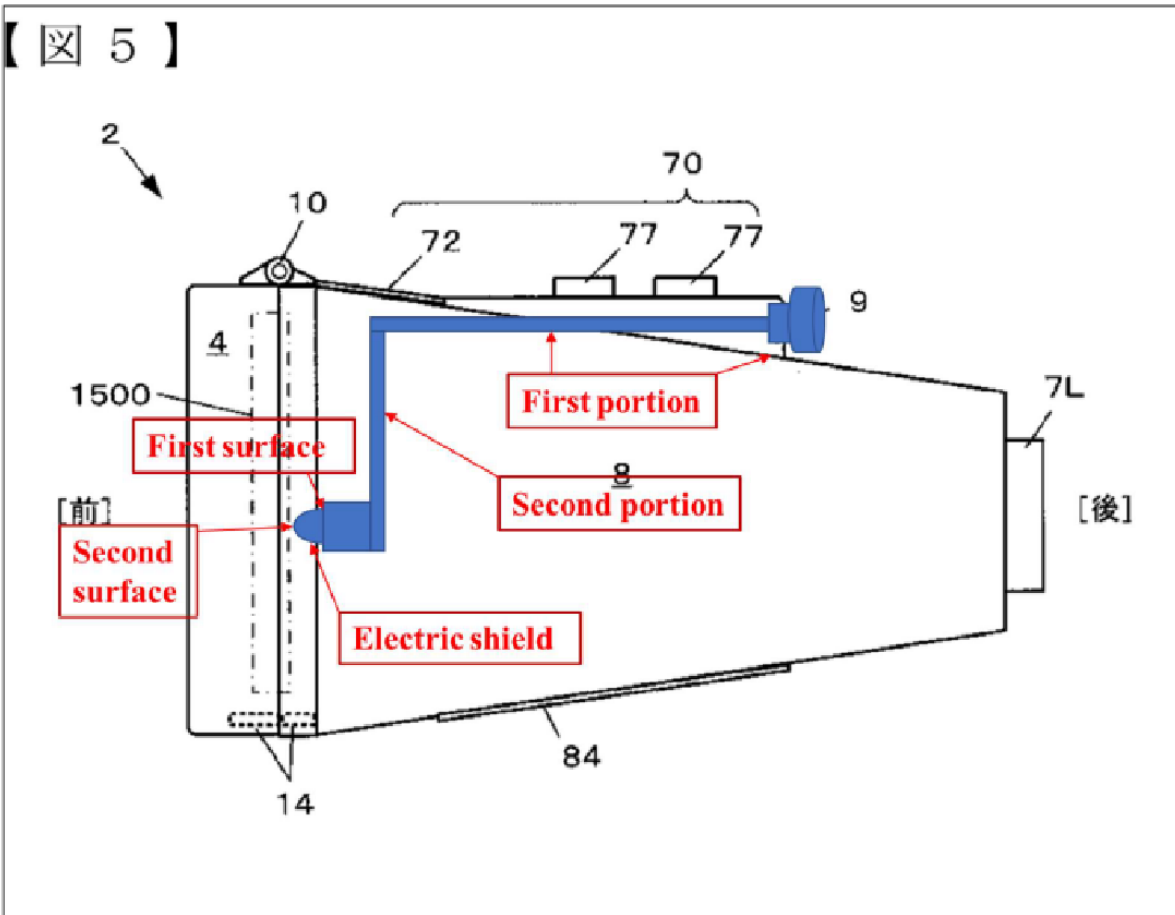
2. Petitioner Fails to Show a Motivation to Combine

Petitioner proposes the same combination of Kondo and Chu for independent claim 18 that it proposes for independent claim 1. Petitioner therefore fails to show that a POSA would have been motivated to combine Kondo and Chu in the manner proposed for claim 18 for the same reasons discussed regarding claim 1, and therefore fails to carry its burden regarding obviousness. EX2050, ¶123.

3. Claim 18(g): wherein a first surface of the electric shield is disposed on the first portion and is electrically coupled to a second surface of the electric shield

Claim 18 recites "an input device including, a first portion that is accessible from an exterior of the housing." Claim 18 further recites "an electric shield, wherein

a first surface of the electric shield is disposed on the first portion and is electrically coupled to a second surface of the electric shield.” Petitioner asserts that this latter recitation is satisfied with the following combination of Kondo and Chu:



Petition at 111 (showing EX1003, Fig. 5 with annotations in blue and red).

Petitioner’s mapping fails to account for the claim language, which requires that “a first surface of the electric shield” be “disposed on the first portion” of the input device, with that first portion being “accessible from an exterior of the

housing.” EX2050, ¶125. For the “first surface of the electric shield,” Petitioner points to the upper collar of Chu’s probe pad 30, which is mounted on sleeve 28 of Chu’s probe head 18. *See, e.g.*, EX1004, Fig. 5, ¶0048. For the “first portion” of the input device, Petitioner points to the outer end of Chu’s actuator shaft 14 that extends through an opening in the housing and button 16 mounted on the shaft. *See, e.g.*, EX1004, Fig. 4, 6, ¶0042, ¶0043. Petitioner repeats this argument with its annotations to Chu’s Figs. 9b and 8. *See* Petition at 112-13.

As Petitioner’s own annotated illustrations make plain, what it calls the “first surface” of Chu’s probe pad 30 is not disposed on what it calls the “first surface” of Chu’s input device. EX2050, ¶126. Therefore, Petitioner has failed to show that its proposed combination includes “an electric shield, wherein a first surface of the electric shield is disposed on the first portion,” with the first portion being “accessible from an exterior of the housing.” *Id.* For this additional reason, Petitioner fails to show that the combination of Kondo and Chu renders claim 18 obvious.

O. Claim 19

Claim 19 depends from claim 18 and includes its recitations. Petitioner fails to establish that the combination of Kondo and Chu renders claim 19 obvious for the same reasons discussed regarding claim 18. EX2050, ¶127.

Petitioner also fails to show that the combination of Kondo and Chu renders obvious claim 19's additional recitations of "a compressible pad disposed between the second portion and the second surface to provide an area of contact between the second surface and the touch-screen that is sufficient to transfer the capacitive touch input." Petitioner relies on its analysis of claims 10 and 11 in support of its assertions that the proposed combination discloses the claimed compressible pad. These arguments fail for the same reasons discussed regarding claims 10 and 11. EX2050, ¶128.

P. Claim 20

1. Petitioner Fails to Show a Motivation to Combine

Petitioner proposes the same combination of Kondo and Chu for independent claim 20 that it proposes for independent claim 1. Petitioner therefore fails to show that a POSA would have been motivated to combine Kondo and Chu in the manner proposed for claim 20 for the same reasons discussed regarding claim 1. EX2050, ¶129.

2. Claim 20(d): a lever that is accessible through the cut-out;

Petitioner relies on its analysis of claim 12 for the recited lever. Therefore, Petitioner's assertion regarding claim 20 fails for the same reasons discussed regarding the "lever" of claim 12. EX2050, ¶130.

3. **Claim 20(f): a flexible linkage coupled to the lever and the housing, wherein the linkage is configured to deform in response to actuation of the lever and thereby guide the portion of the surface between the first position and the extended position**

Claim 20 recites, *inter alia*, “a flexible linkage coupled to the lever and the housing, wherein the linkage is configured to deform in response to actuation of the lever and thereby guide the portion of the surface between the first position and the extended position.”

Petitioner relies on its analysis regarding claims 12 and 14 for this recitation of claim 20. While the language of claim 20(f) is similar to the “flexible linkage” recitation in claim 12, it is different in that claim 12 requires that the flexible linkage be coupled to the housing, whereas claim 20 requires that the flexible linkage be coupled to the lever. Petitioner does not attempt to argue that Chu’s biasing spring (which Petitioner improperly equates to the flexible linkage) is coupled to the components that Petitioner argues constitute the claimed lever. Nor does Chu indicate this is the case. Petitioner therefore fails to establish that the proposed combination teaches this aspect of claim 20(f). EX2050, ¶132.

Moreover, claim 20’s recitation that the flexible linkage is “configured to deform in response to actuation of the lever and *thereby guide the portion of the surface between the first position and the extended position*” is identical to claim

12's. Therefore, Petitioner fails to show that the proposed combination renders this recitation obvious for the same reasons discussed regarding claim 12. EX2050, ¶133.

VI. Secondary Considerations of Nonobviousness

“Evidence that the industry praised a claimed invention or a product that embodies the patent claims weighs against an assertion that the same claim would have been obvious.” *Lectrosonics, Inc. v. Zaxcon, Inc.*, IPR2018-01129, Paper 33 (PTAB Jan. 24, 2020) (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1334 (Fed. Cir. 2016)). Indeed, “evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not.” *Pentec, Inc. v. Graphic Controls Corp.*, 776 F.2d 309, 315 (Fed. Cir. 1995); *see also Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1358 (Fed. Cir. 2013). Proper consideration of objective indicia of nonobviousness helps “in avoiding the trap of hindsight when reviewing, what otherwise seems like, a combination of known elements.” *Leo*, 726 F.3d at 1358.

A. Claim 1 is Entitled to a Presumption of Nexus

As demonstrated in the following claim chart and the accompanying Second Declaration of Patrick Buckley, claim 1 of the '075 patent reads on and is coextensive to (the claims have a one-to-one mapping to the V1.2 Viewer)) the V1.2

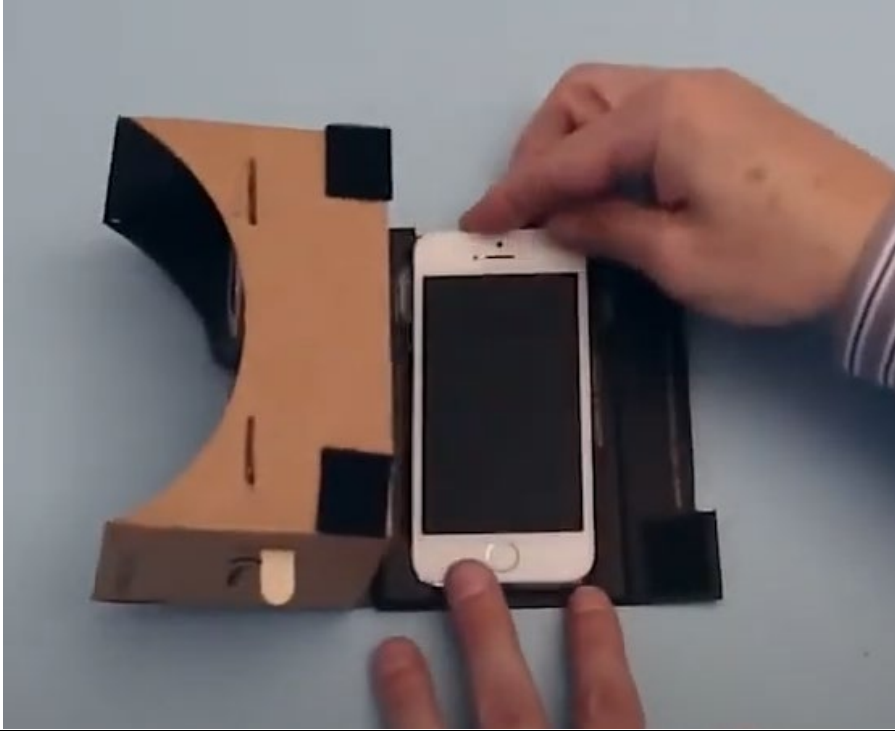
Viewer sold by DODOcase (Patent Owner's predecessor-in-interest). EX2054, ¶¶2-

3.

Claim Language	Description
1(a) ²	The DODOcase Virtual Reality viewer 1.2 product, open, front view, showing the hollow interior, lenses, user input on exterior, and touchscreen input with electric shield in the center. 
	The DODOcase Virtual Reality viewer 1.2 product, closed view with mobile device inserted:

² The claim references in this chart match those used in Petitioner's Petition.

		
Claim 1(b)	The DODOcase Virtual Reality viewer 1.2 product is shown receiving a mobile device such that the mobile device is centered and directly in the user's field of view when looking into the hollow interior of the housing. 	

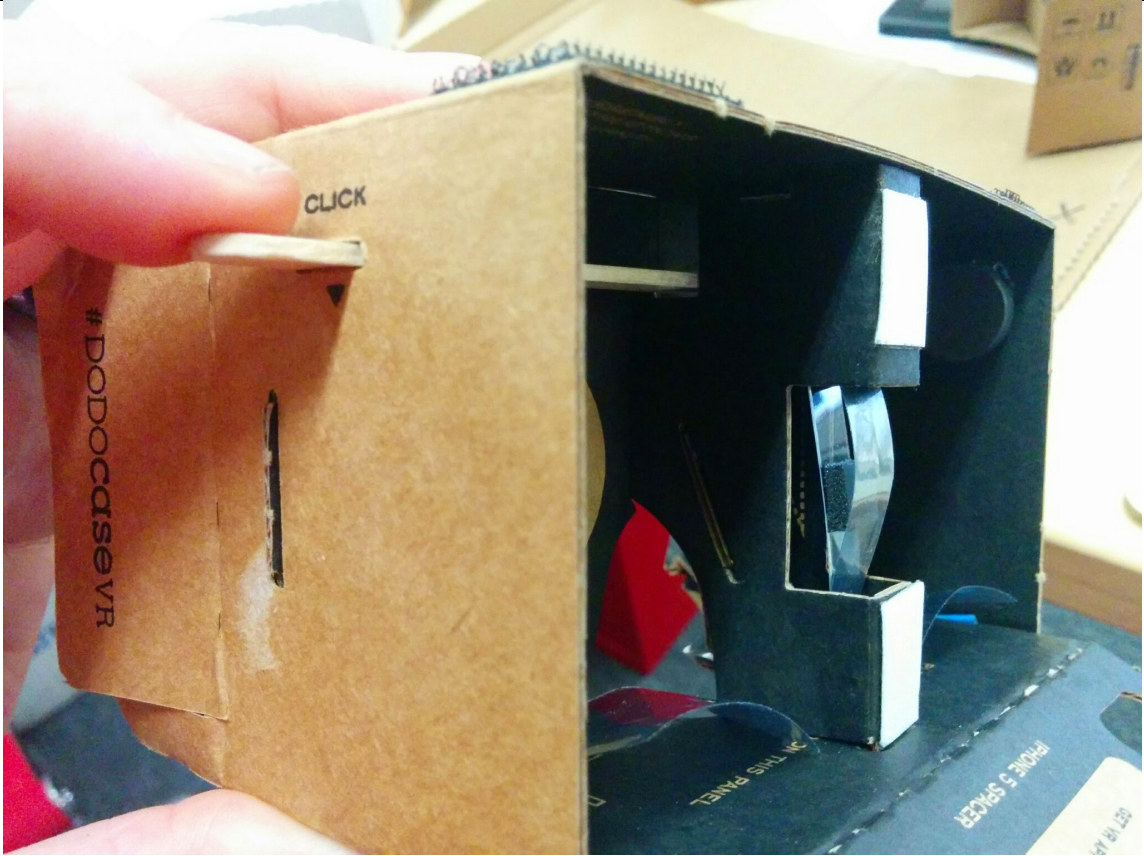
	The DODOcase Virtual Reality viewer 1.2 product, top view, receiving a mobile device such that the mobile device is centered and directly in the user's field of view when looking into the hollow interior of the housing. 
Claim 1(c)	The DODOcase Virtual Reality viewer 1.2 product, front view, showing an input mechanism that is accessible from the exterior of the housing in the first position.

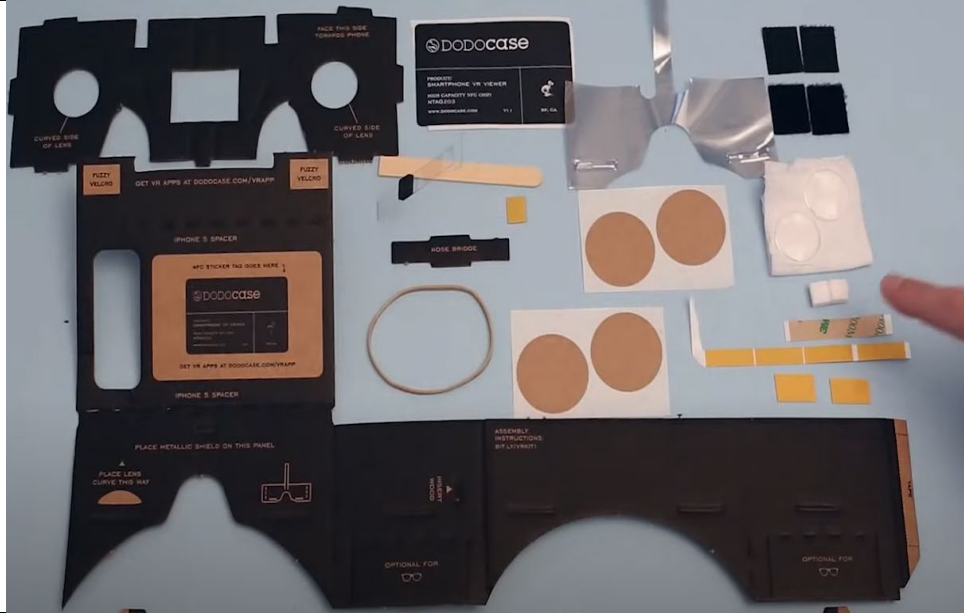
	
	The DODOcase Virtual Reality viewer 1.2 product, front view, showing an input mechanism that is accessible from the exterior of the housing with a user's finger on the input mechanism.

		
	The DODOcase Virtual Reality viewer 1.2 product, side view, showing an input mechanism that is accessible from the exterior and is movable within the interior, in the first position.	

		
	The DODOcase Virtual Reality viewer 1.2 product, side view, showing an input mechanism that is accessible from the exterior and is movable within the interior, in the extended position.	

		
	The DODOcase Virtual Reality viewer 1.2 product, side view, showing an input mechanism that is accessible from the exterior and is movable within the interior, in the first position.	

	
Claim 1(d)	The photograph below shows the component pieces of the DODOcase Virtual Reality viewer 1.2. The silver piece in the upper right corner is the electrical shield, and the center of the thin strip is what contacts the central region of the touchscreen once the device is assembled. The images included above regarding the previous claim element show this electrical shield in the assembled device and illustrate what portion of the electrical shield makes contact with the central region of the touchscreen of the mobile electronic device when the input mechanism is in the extended position.



The DODOcase Virtual Reality viewer 1.2 product partially assembled, showing the portion of the surface of the electrical shield that does not make contact with the touchscreen when the input mechanism is in the extended position.

		
	The DODOcase Virtual Reality viewer 1.2 product assembled showing the portion of the surface of the electrical shield that does and does not make contact with the touchscreen when the input mechanism is in the extended position.	

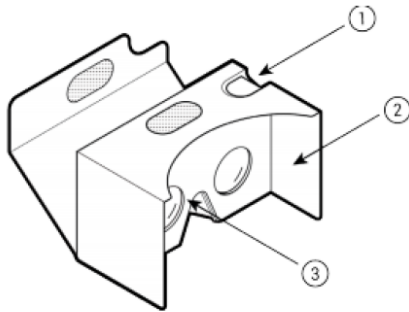


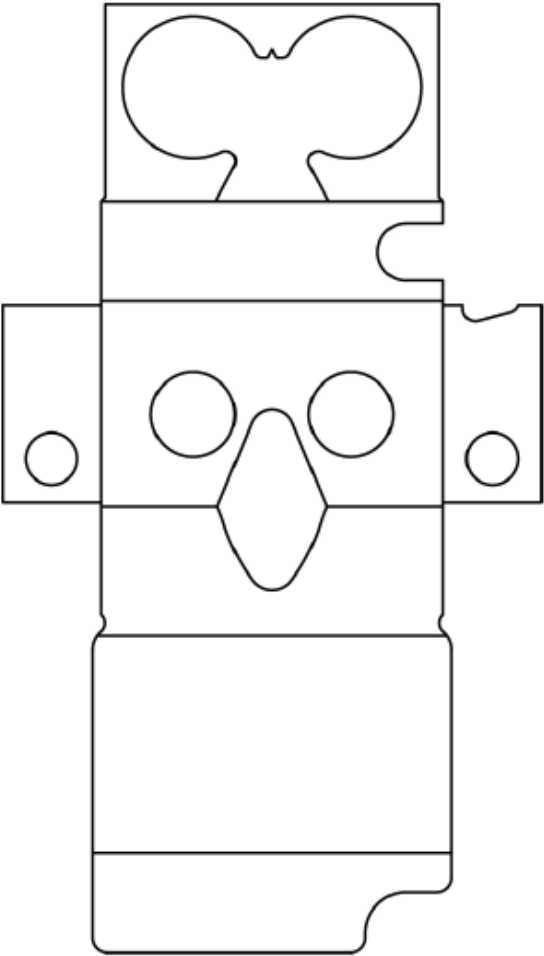
The DODOcase VR 1.2 did not include any critical unclaimed features beyond those recited in claim 1. EX2054, ¶3. As described below, the distinguishing feature of the DODOcase VR 1.2 Viewer was the user input mechanism. *Id.* The input mechanism recited in claim 1 and found in the VR1.2 Viewer drew praise from Google. *Id.* Thus, the DODOcase VR 1.2 Viewer “embodies” the claimed features and is “coextensive with them.” *Id.*; see also *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (citations omitted). Therefore, Patent Owner is entitled to a presumption of nexus.

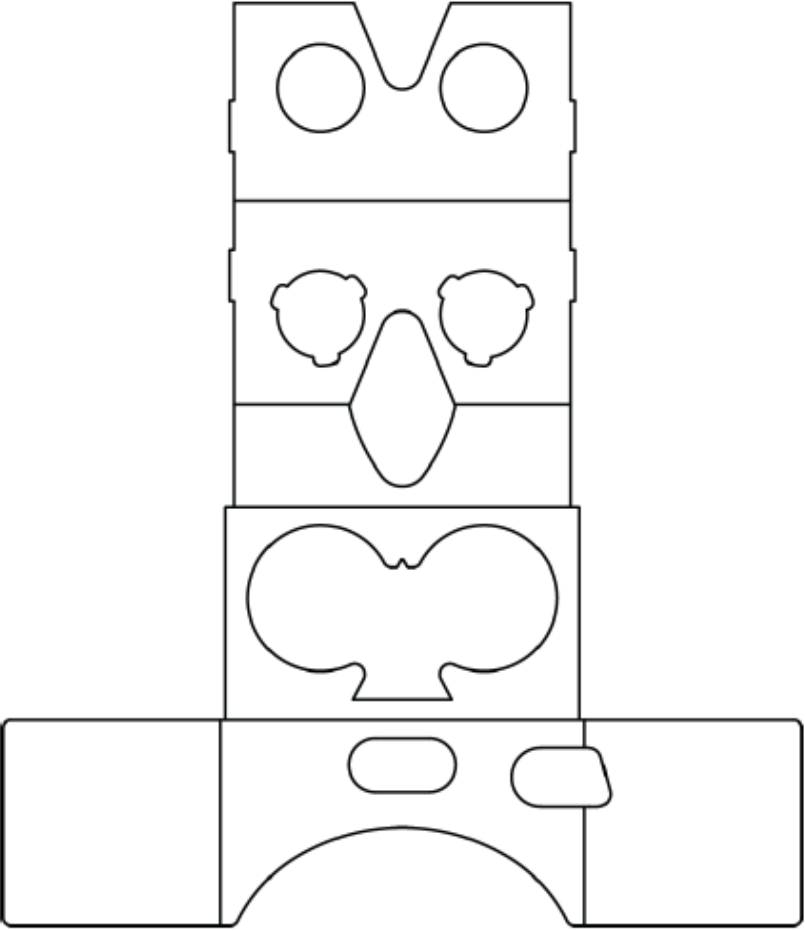
The genuineness of Google’s praise is shown by its decision soon thereafter to copy DODOcase by incorporating a similar capacitive button as provided on the DODOcase VR 1.2 Viewer. EX2054, ¶4. The following is a claim chart showing how Google’s GCV2 VR viewer, which was introduced by Google after it had reviewed and praised the DODOcase VR1.2 viewer (and its button mechanism specifically), includes the praised capacitive button of claim 1 of the ‘075 patent (and Claim 1 reads on the Google GCV2 VR viewer as shown in the claim chart below). EX2054, ¶4. *See Liqwd, Inc. v. L’Oreal USA, Inc.*, 941 F.3d 1133, 1137-39 (Fed. Cir. 2019) (finding PTAB erred in disregarding evidence of copying in obviousness analysis); *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202 (Fed. Cir. 2023) (vacating Board’s obviousness determination for, *inter alia*, failing to properly account for evidence of copying, which the Federal Circuit noted is “usually considered . . . to be strong evidence of nonobviousness”) (internal quotation omitted).

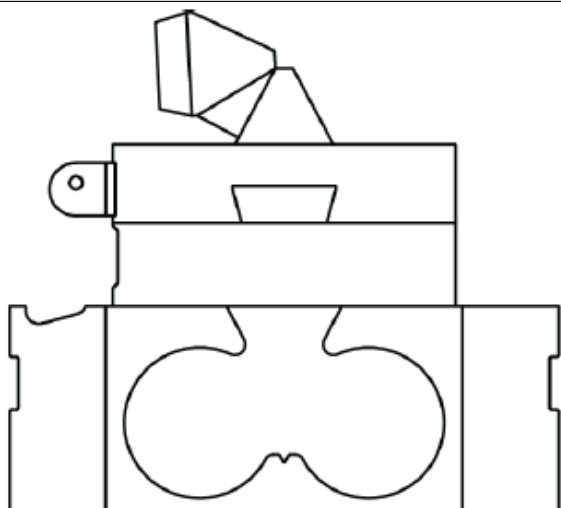
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (“Cardboard Viewer”)
Claim 1(a) ³	<i>The Cardboard Viewers are virtual reality viewers for use with a mobile electronic device having a touch screen (e.g., “smartphone”).</i>

³ The claim references in this chart match those used in Petitioner’s Petition.

U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (“Cardboard Viewer”)
	 GCV2 Physical Unit.  Figure 1. Typical components of a Google Cardboard viewer: (1) - input, (2) - enclosure, (3) - lenses. Google Cardboard Best Practices – Version 3.0 (2020). 3.2. Cardboard Mechanical Design Specifications Google Cardboard (I/O 2015) mechanical body consists of three distinct parts: chassis, t-shirt and button. Each of these parts is made from the corrugated cardboard.

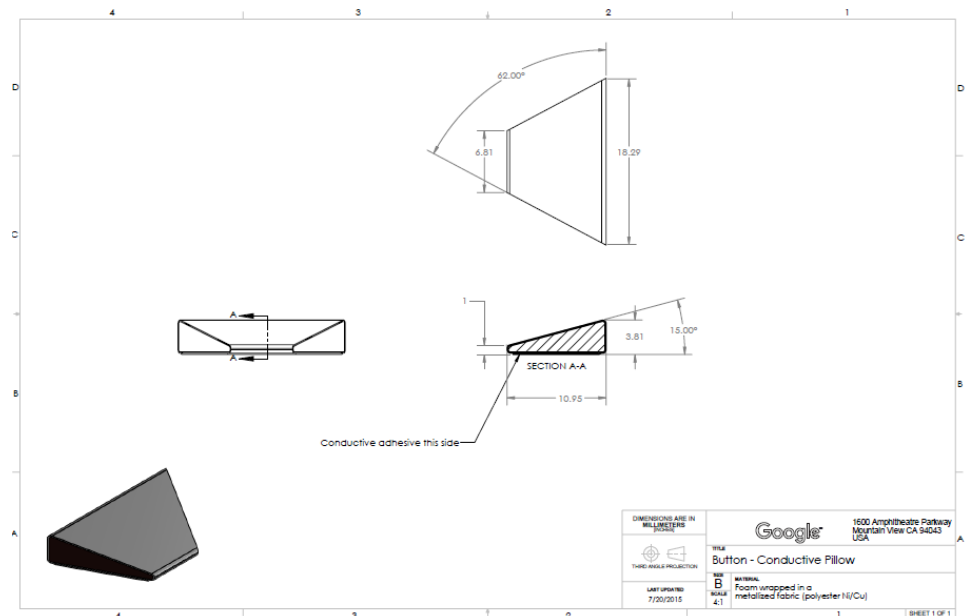
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER ("Cardboard Viewer")
	 <i>Figure 2. Cardboard mechanical body: "chassis" part.</i>

U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 <i>Figure 3. Cardboard mechanical body: "t-shirt" part.</i>

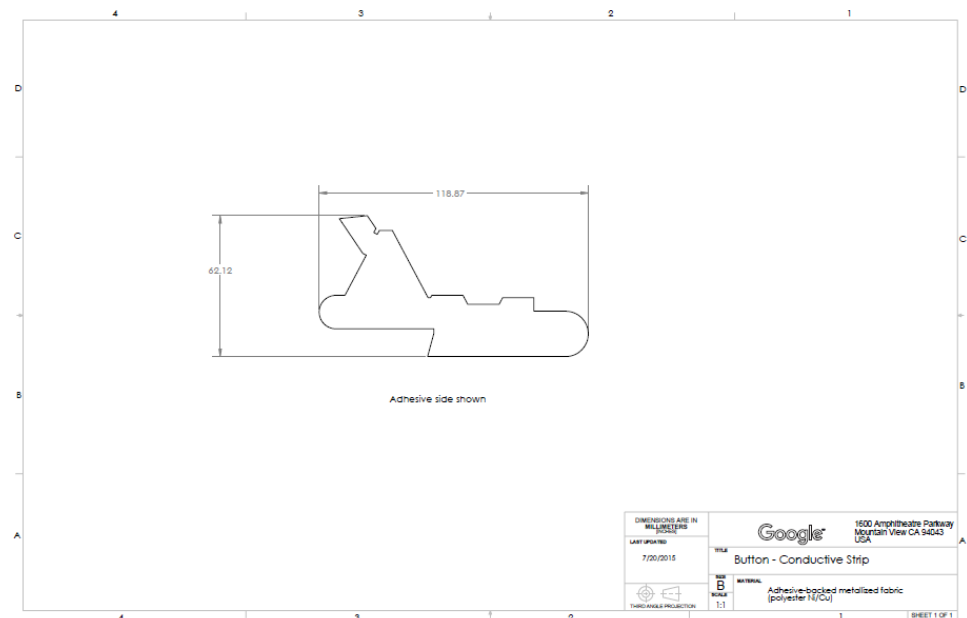
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER ("Cardboard Viewer")																											
	 Figure 4. Cardboard mechanical body: "button" part. Google Cardboard (I/O 2015) Technical Specification – Version 2.0 (2015). 4.1. Corrugate Tooling Verification The following critical dimensions should be verified for the corrugate tooling (e.g. die-cuts) before proceeding to production. For critical dimension illustrations (A, B, C) in Table 12 see the figures below. <table><tr><th>Parameters</th><th>Value</th><th>Unit</th><th>Note</th></tr><tr><td>Distance between two fold lines defining the thickness of Cardboard chassis</td><td>40 (+/-0.5)</td><td>mm</td><td>A, C</td></tr><tr><td>Distance between the centers of lens holders (IPD)</td><td>64 (+/-0.5)</td><td>mm</td><td>B</td></tr></table> Table 13: Corrugate tooling verification specifications. 4.3. Assembled First Article Verification The following distances are critically important for the final, assembled units. Inspect the first articles of the fully assembled viewers to ensure that these tolerances are respected. <table><tr><th>Parameters</th><th>Value</th><th>Tolerance</th><th>Unit</th><th></th></tr><tr><td>Distance from the back surface to the screen (see picture below)</td><td>37.3</td><td>+2/-0.5</td><td>mm</td><td>D</td></tr><tr><td>Distance between the centers of lens holders</td><td>64</td><td>+/-0.5</td><td>mm</td><td>B</td></tr></table> Table 15: Finished assembly tolerance specifications. 4.4. Additional First Article Approval Criteria After verifying that the critical tolerances in Table 13 hold for the first articles, ensure that the criteria described below hold for the assembled units. Google Cardboard (I/O 2015) Technical Specification – Version 2.0 (2015).	Parameters	Value	Unit	Note	Distance between two fold lines defining the thickness of Cardboard chassis	40 (+/-0.5)	mm	A, C	Distance between the centers of lens holders (IPD)	64 (+/-0.5)	mm	B	Parameters	Value	Tolerance	Unit		Distance from the back surface to the screen (see picture below)	37.3	+2/-0.5	mm	D	Distance between the centers of lens holders	64	+/-0.5	mm	B
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U.S. Patent
No. 9,420,075
Claim 1

GOOGLE CARDBOARD GCV2 VR VIEWER
("Cardboard Viewer")

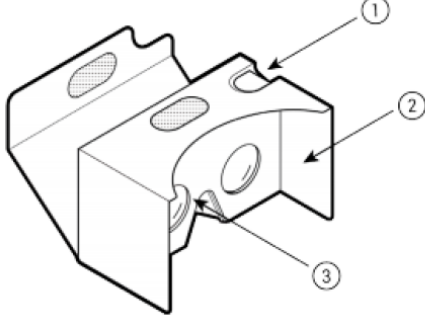


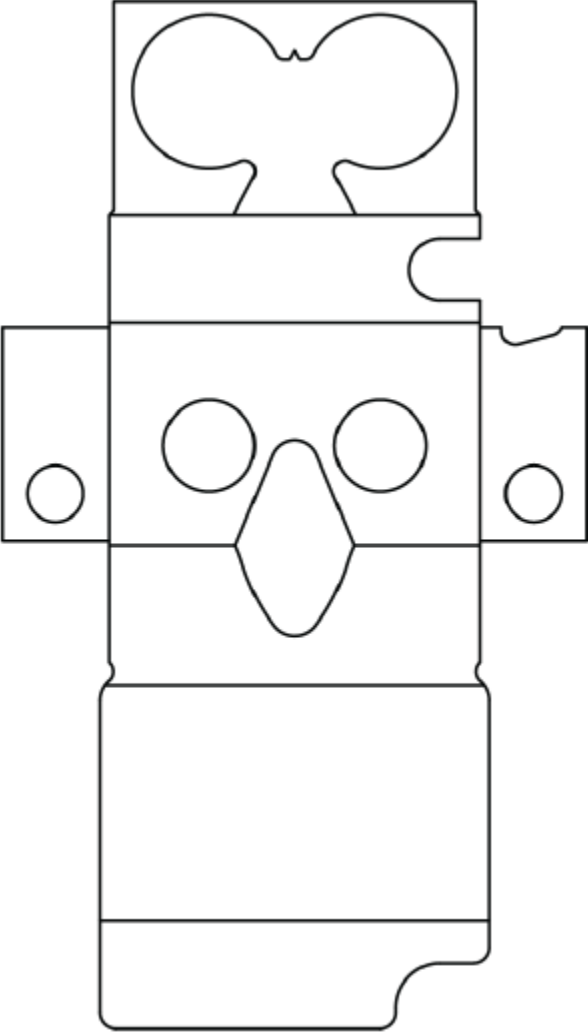
Button – Conductive Pillow.pdf

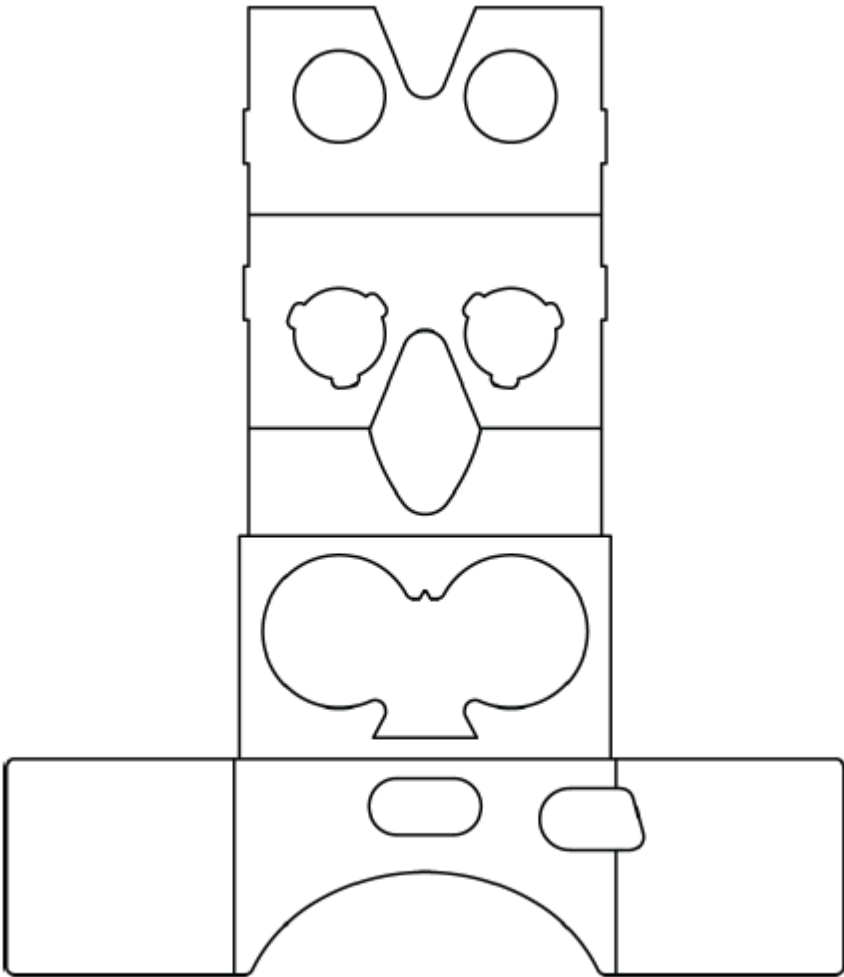


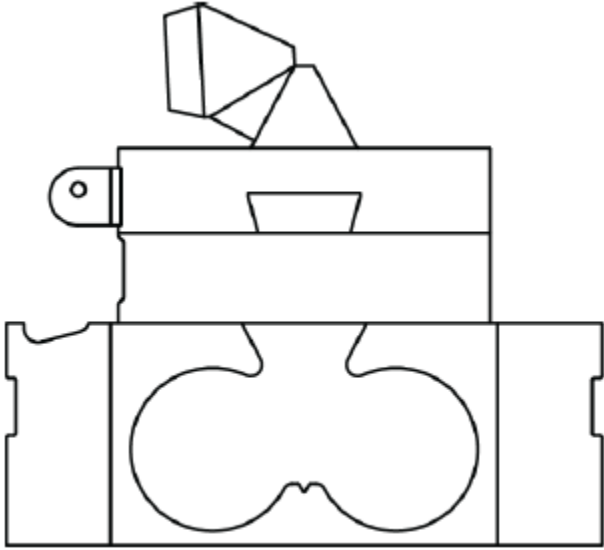
Button – Conductive Strip.pdf

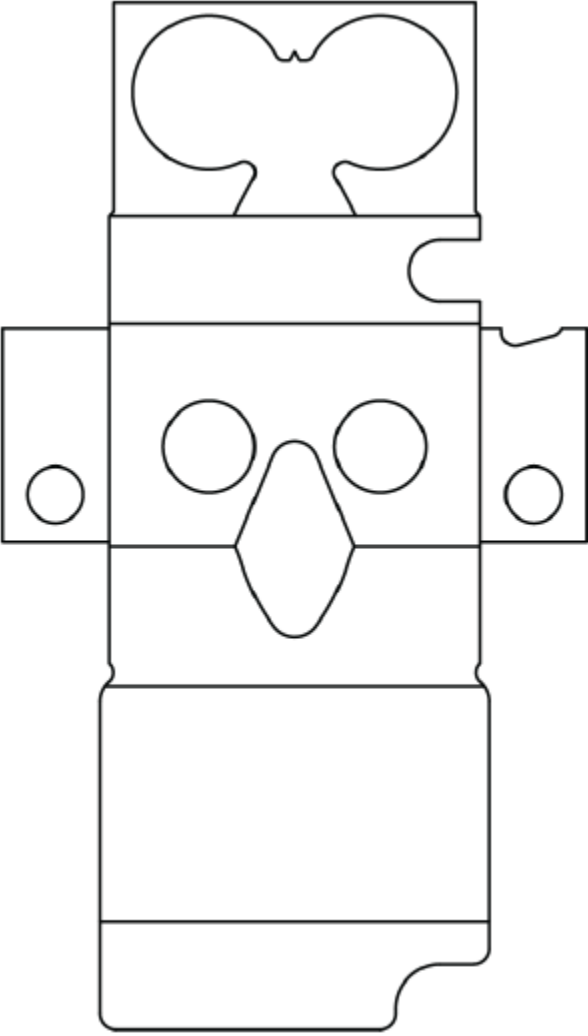
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER ("Cardboard Viewer")														
	Technical drawing of the Cardboard Viewer Body, showing the outside view (knife side) with dimensions and labels. The drawing includes a chassis, flaps, and a button. Dimensions are provided in millimeters. A note indicates "Obtain cut in the center of the middle piece" for the flaps. A table in the bottom right corner provides additional information: <table><tr><td colspan="2">DIMENSIONS ARE IN MILLIMETERS</td><td rowspan="2">Google 1600 Amphitheatre Parkway Mountain View, CA 94043 USA</td></tr><tr><td>VIEW</td><td>Viewer - Body</td></tr><tr><td>DATE</td><td>7/20/2015</td><td>MATERIAL</td></tr><tr><td>REV</td><td>B</td><td>E-flute corrugated board</td></tr><tr><td>SCALE</td><td>1:4</td><td></td></tr></table> SHEET 1 OF 1 Viewer – Body.pdf	DIMENSIONS ARE IN MILLIMETERS		Google 1600 Amphitheatre Parkway Mountain View, CA 94043 USA	VIEW	Viewer - Body	DATE	7/20/2015	MATERIAL	REV	B	E-flute corrugated board	SCALE	1:4	
DIMENSIONS ARE IN MILLIMETERS		Google 1600 Amphitheatre Parkway Mountain View, CA 94043 USA													
VIEW	Viewer - Body														
DATE	7/20/2015	MATERIAL													
REV	B	E-flute corrugated board													
SCALE	1:4														
Claim 1(b)	<i>The Cardboard Viewers comprise a housing configured to receive the mobile electronic device.</i> Photograph showing a hand holding the assembled Cardboard Viewer. The viewer is a cardboard housing configured to receive a mobile electronic device (a smartphone). The device is inserted into the housing, and the viewer is shown in a perspective view.														

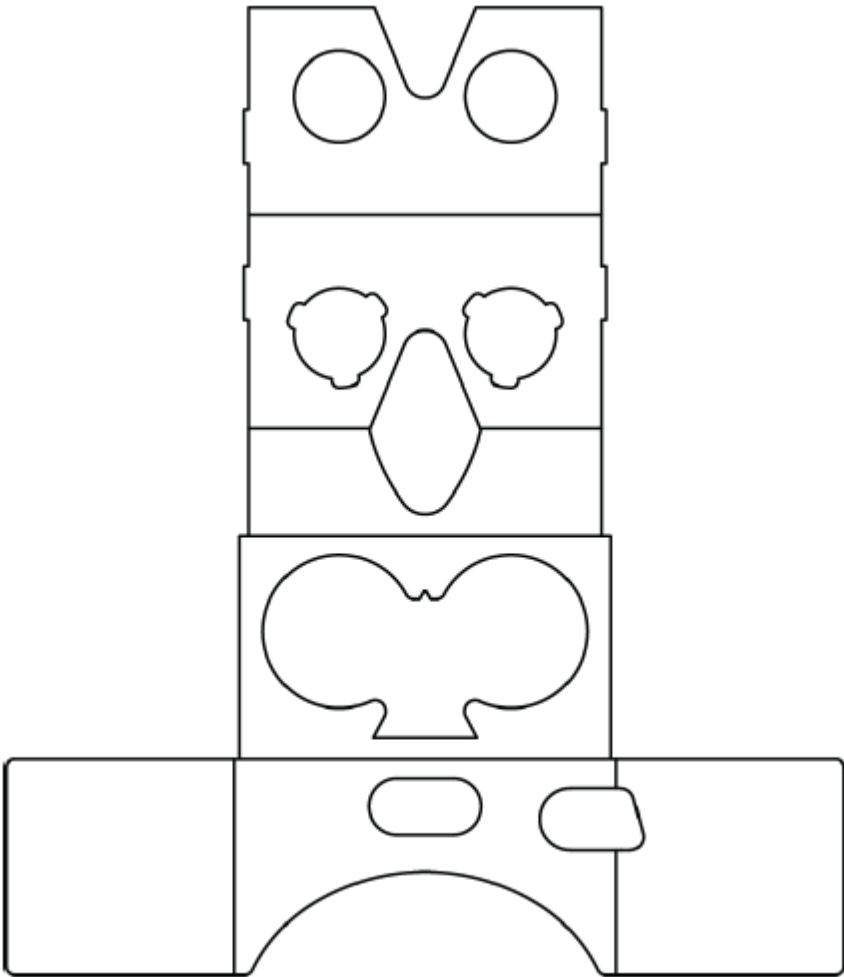
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (“Cardboard Viewer”)
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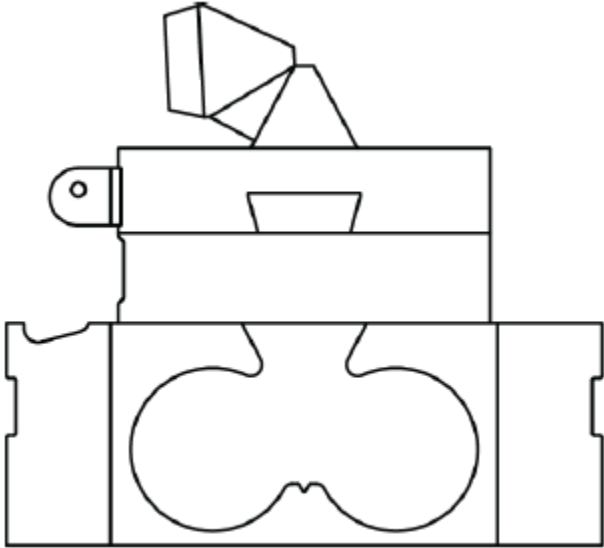
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 <i>Figure 2. Cardboard mechanical body: "chassis" part.</i>

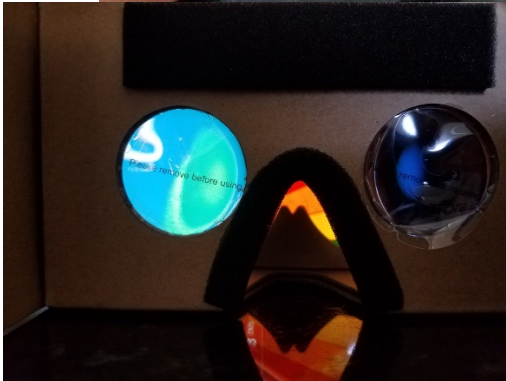
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 <i>Figure 3. Cardboard mechanical body: "t-shirt" part.</i>

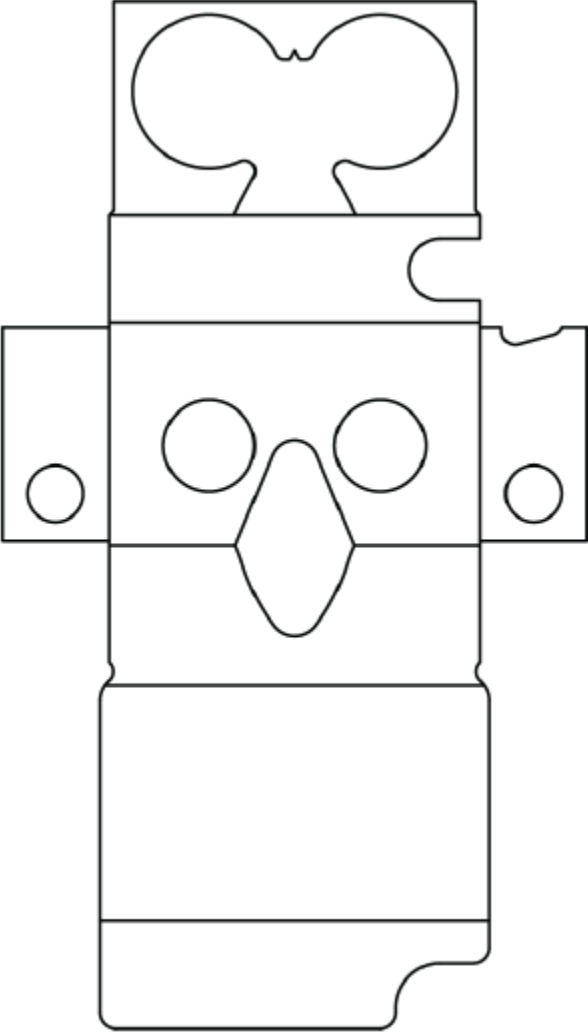
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 <i>Figure 4. Cardboard mechanical body: "button" part.</i> Google Cardboard (I/O 2015) Technical Specification – Version 2.0 (2015).
	<i>The housing of the Cardboard Viewers is configured to hold the mobile electronic device such that the touch screen is generally centered in a horizontal direction.</i>  GCV2 Physical Unit. 3.2. Cardboard Mechanical Design Specifications Google Cardboard (I/O 2015) mechanical body consists of three distinct parts: chassis, t-shirt and button. Each of these parts is made from the corrugated cardboard.

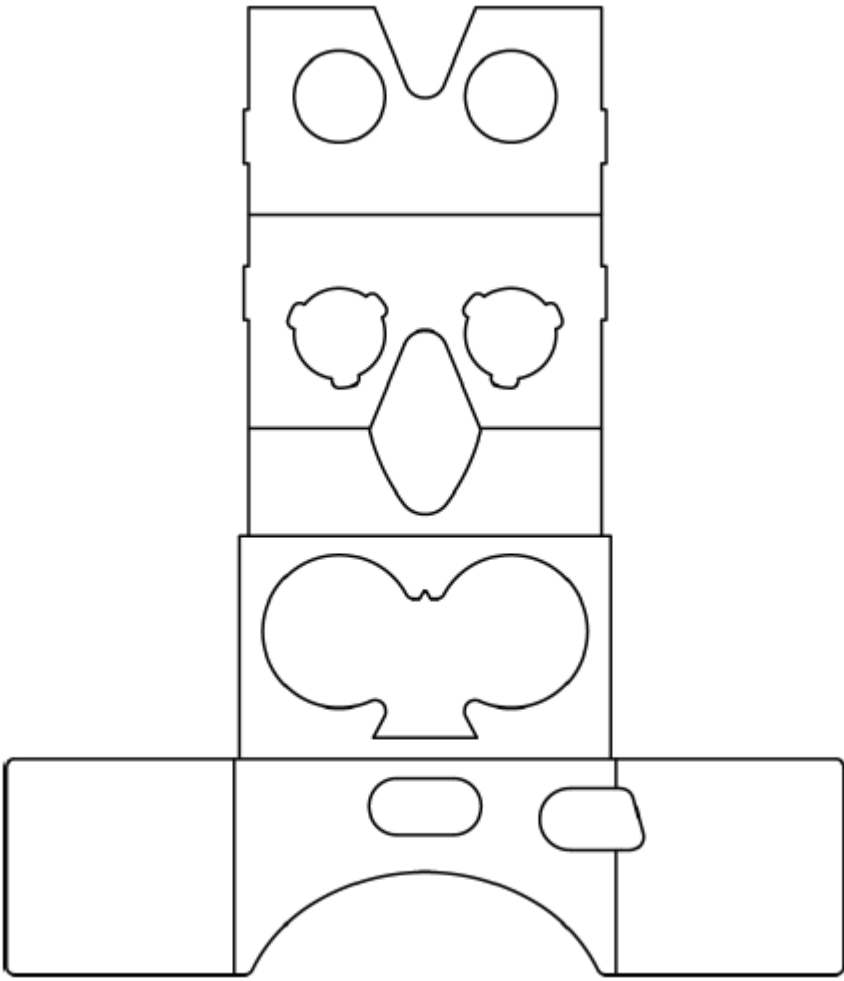
U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 <i>Figure 2. Cardboard mechanical body: "chassis" part.</i>

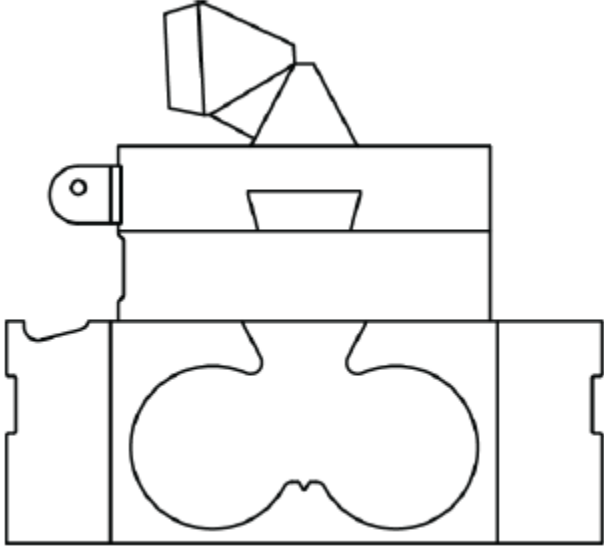
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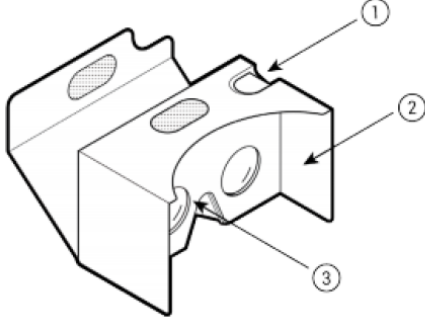
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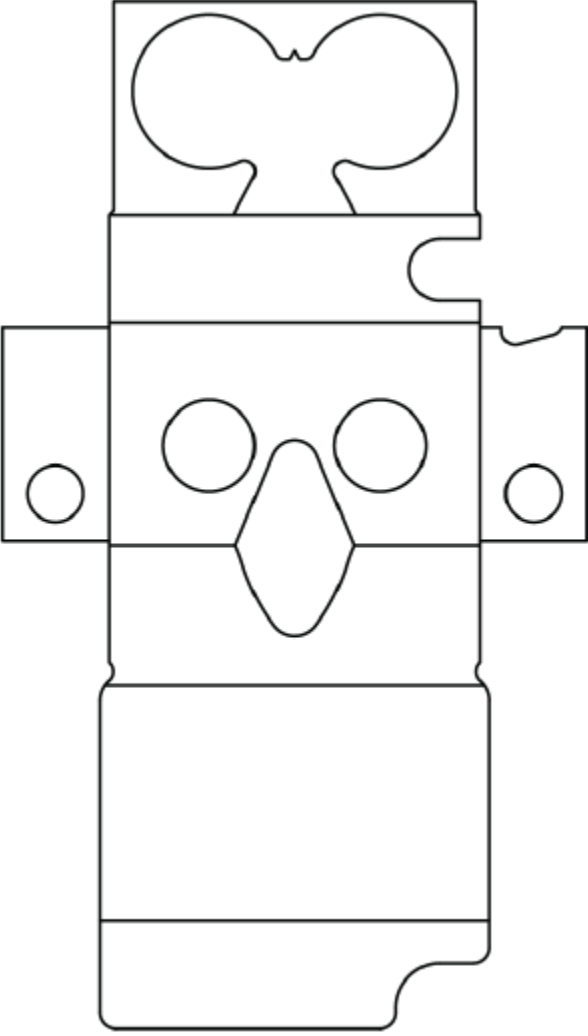
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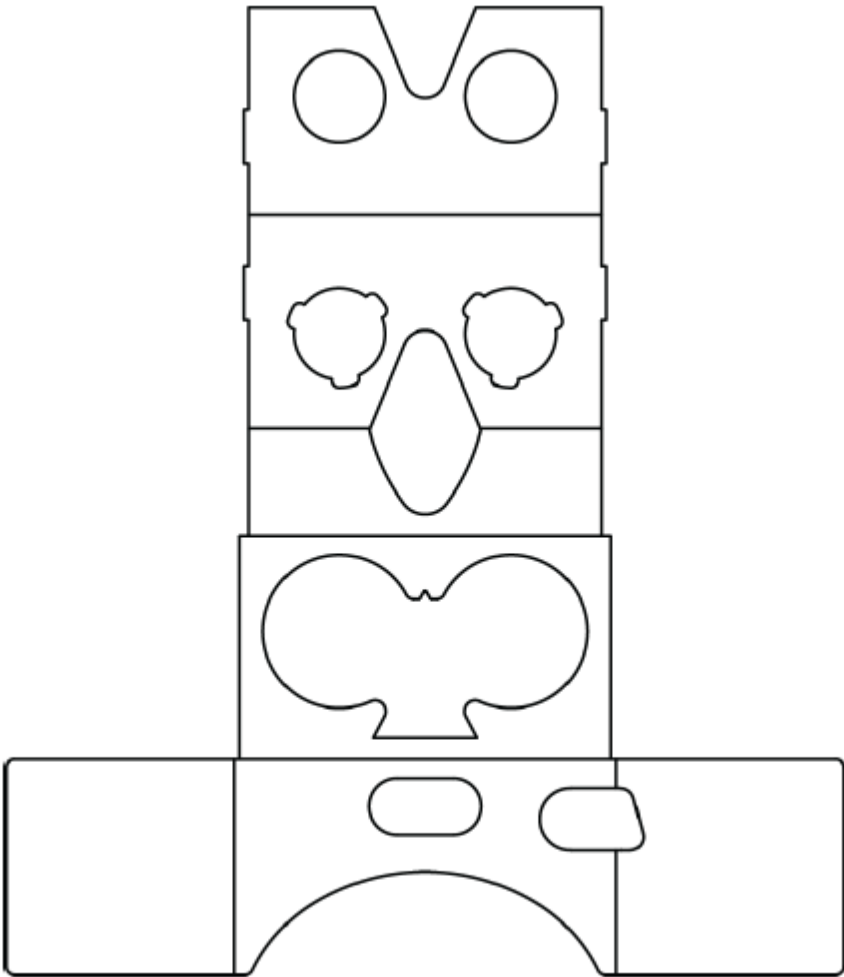
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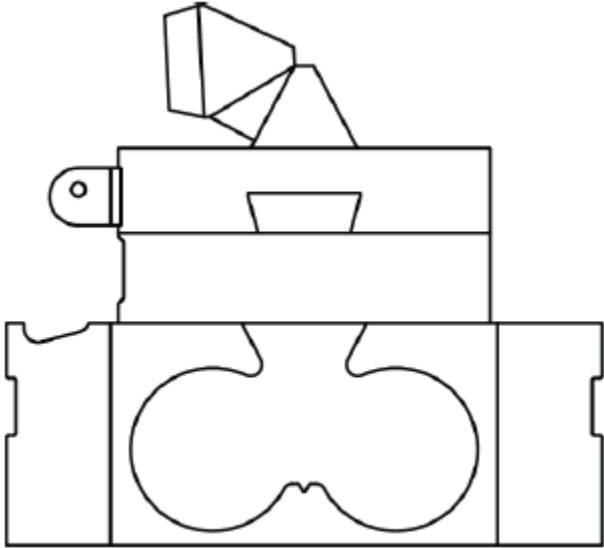
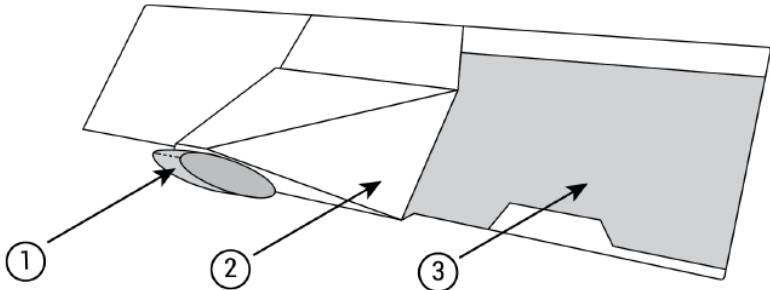
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Claim 1(c)	<i>The Cardboard Viewers further comprise an input mechanism that is accessible from an exterior of the housing.</i>  GCV2 Physical Unit.

U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	 Figure 1. Typical components of a Google Cardboard viewer: (1) - input, (2) - enclosure, (3) - lenses. Google Cardboard Best Practices – Version 3.0 (2020). 3.2. Cardboard Mechanical Design Specifications Google Cardboard (I/O 2015) mechanical body consists of three distinct parts: chassis, t-shirt and button. Each of these parts is made from the corrugated cardboard.

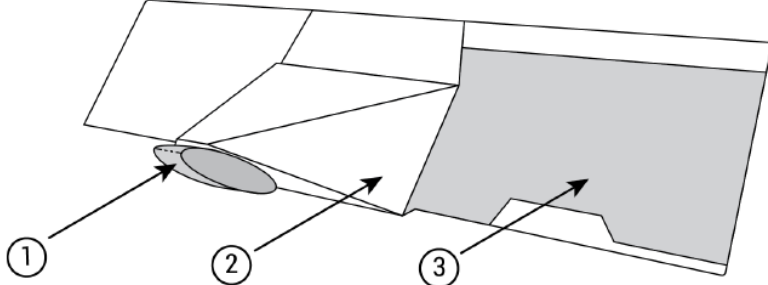
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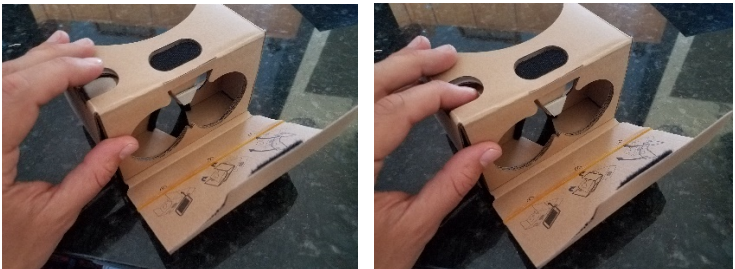
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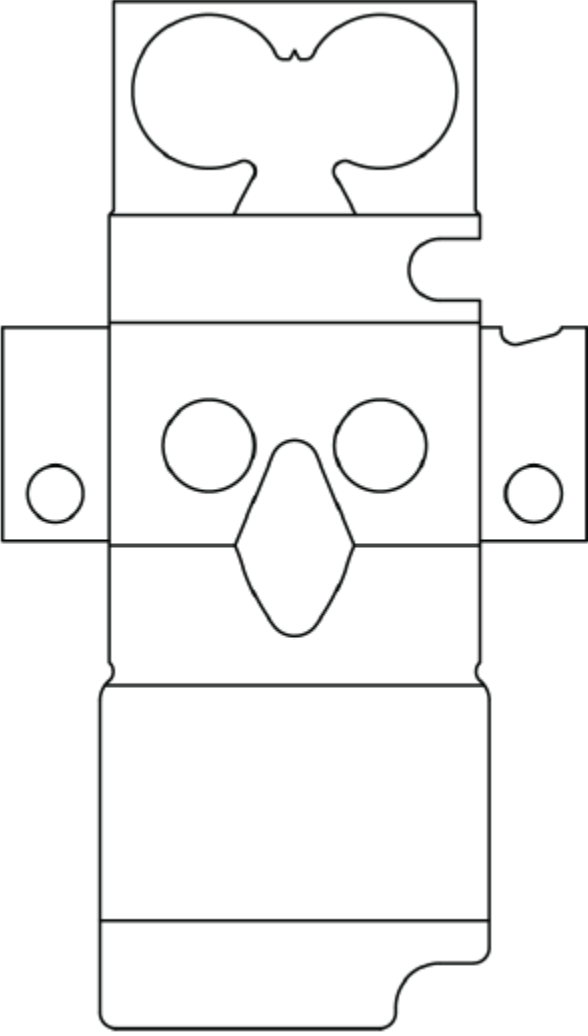
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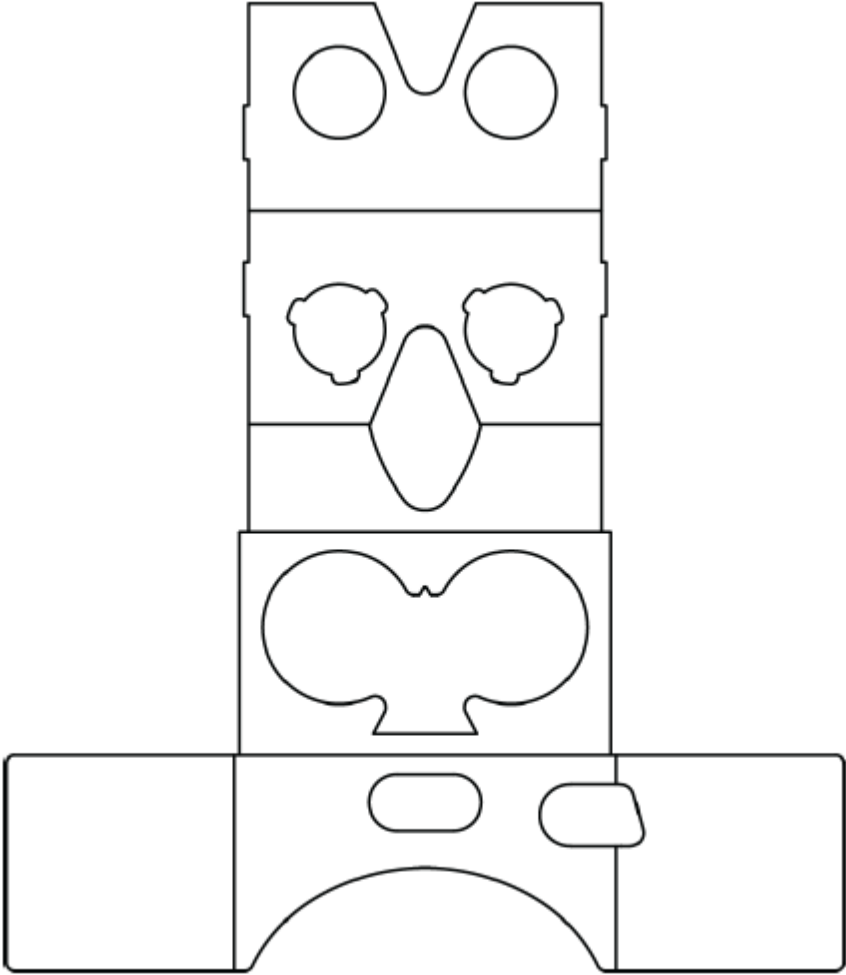
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U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
	  GCV2 Physical Unit.
Claim 1(d)	<i>The input mechanism of the Cardboard Viewers comprises an electrical shield having a surface.</i>  GCV2 Physical Unit.

U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (“Cardboard Viewer”)																														
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U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
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U.S. Patent No. 9,420,075 Claim 1	GOOGLE CARDBOARD GCV2 VR VIEWER (<i>"Cardboard Viewer"</i>)
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B. Objective Evidence of Nonobviousness Tied to the DODOcase VR 1.2

1. The Claimed Invention Addressed a Long-Felt Need

The attached Second Declaration of Patrick Buckley sets forth the history of VR viewers using a smartphone. In September 2008, Apple filed a patent application that issued as U.S. Patent No. 8,957,835. This patent disclosed a “[h]ead-mounted

display systems and methods of operation that allow users to couple and decouple a portable electronic device such as a handheld portable electronic device with a separate head-mounted device.” It did not disclose a capacitive button mechanism as utilized in the DODOcase VR 1.2 and as recited in claim 1 of the ’075 patent.

EX2054, ¶12.

In March 2011, Hasbro launched its My3D product with cutouts that allow fingers to touch the screen as a mode of user input. It makes no mention of a capacitive button mechanism as described in the DODOcase claimed invention.



EX2054, ¶13.

In May 2013, Open Dive launched as a DIY build for a smartphone VR holder. It used a cutout in the housing to allow a user's finger to touch the screen as the mode of user input. It makes no mention of a capacitive button mechanism as described in the DODOcase claimed invention. EX2054, ¶15 (referencing <https://www.youtube.com/watch?v=pgqxcExtjTw>).

In November 2013, Durovis Dive was launched by Shoogee. This product provided a cutout in the housing, allowing a user's finger to touch the screen as the mode of user interaction. It makes no mention of a capacitive button mechanism as described in DODOcase claimed invention.



EX2054, ¶16.

On June 25, 2014, Google launched a VR viewer known as Google Cardboard V1 (“GCV1 Viewer”) at its 2014 I/O Conference. EX2033, ¶20; EX2004, ¶24.

Google’s purported improvement involved a magnetic switch to interact with the magnetometer/compass of a smartphone to simulate a touch event (an inferior design that worked unreliably on a small number of mobile devices). EX2033, ¶22. During its demonstration of the GCV1 Viewer at the 2014 I/O Conference, Google described its magnet interaction technique and the state of the art in VR viewer development at that time. *Id.*, ¶23. Thus, Google recognized, before Spring of 2014, that there was a need for a VR viewer with an improved input mechanism. *Id.*, ¶24. But rather than develop a VR viewer with a conductive/capacitive button input (as disclosed in and claimed by the ’075 patent), Google opted for a magnet input. *Id.*, ¶25.

Despite many different available VR viewer types, no VR viewer existed with a capacitive/conductive touch mechanism to interact with the touchscreen of a smartphone (and possessing its corresponding advantages). *Id.*, ¶26. Google highlighted DODOcase at that conference as the first company to sell a VR viewer based on the GCV1 Viewer design (only four or five hours after Google posted its GCV1 Viewer designs on its website for manufacturers to use). *Id.*, ¶27; EX2004, ¶25. During manufacture and assembly of the first commercially available GCV1

Viewer, Mr. Buckley immediately recognized flaws in Google's design and set out to improve on the GCV1 Viewer by adding a capacitive/conductive touch button.

EX2033, ¶ 28.

On July 10, 2014, Mr. Buckley emailed members of the Google Cardboard team (Andrew Nartker and Clay Bavor) stating: "I think we have a clever/elegant way to make a conductive tap button which has a couple of advantages." EX2034, 3-4. Mr. Nartker responded on July 11: "Conductive button: Agree this could have benefits. We experimented briefly with this but didn't fully refine. Alex [Kauffmann], one of our lead engineers, has offered to visit DodoCase next week to share our tips here. Are you free next Weds [July 16, 2014] afternoon/end of day?" (*Id.* at 3 (emphasis added).) Thus, Google acknowledged that there was a need for a better input mechanism than the magnet of the GCV1 viewer, admitted that Google's highly skilled engineers had started to develop such a button, yet did not bring it to fruition. Thus, at the time of invention, Google's own conduct shows a long-felt but unresolved need for the very technology disclosed in and claimed by the '075 patent, and failure of others, including Google itself, to provide a safe, reliable way for users to provide a touch input to a smartphone housed in a VR viewer.

After filing a provisional patent application, Mr. Buckley set out to manufacture and assemble a VR viewer with the inventive improvement. EX2033, ¶

29. On July 25, 2014, Mr. Buckley sent a follow-up email to Google (with attached video clips) stating in pertinent part: “I am most excited by what I think is a breakthrough on a very simple conductive touch button for the cardboard viewer. Check out the attached video clips.” *Id.*, ¶3; EX2034 at 1-2; EX2004, ¶31. Those video clips showed a working prototype, based on the embodiments disclosed in the first provisional application to which the ’075 patent claims priority. EX2033, ¶ 30; EX2004, ¶ 31; EX2060; EX2061; EX2054, ¶11.

On the next day, July 26, Mr. Nartker (co-founder and Project Manager Lead for Google Cardboard) responded: “That button looks really neat! Thanks for sharing.” EX2033, ¶ 4; EX2034 at 1; EX2004, ¶ 32 (emphasis added). On July 27, Mr. Kauffmann (lead engineer who led all aspects of the design of Google’s Cardboard viewer) responded: “That’s an ingenious button! Does it work consistently on a variety of phones? I’d love to play with it.” EX2033, ¶ 5; EX2034 at 1; EX2004, ¶ 33 (emphasis added). And Mr. Bavor (computer scientist and Google’s Vice President of Virtual Reality/Augmented Reality) reiterated: “That button is genius.” EX2033, ¶ 6; EX2034 at 1; EX2004, ¶ 34 (emphasis added). Thus, after having considered its own conductive/capacitive button for a VR viewer and then failing to fully refine it, Google’s lead engineer, VR project manager, and VR Vice President, each lauded the successes of Mr. Buckley’s claimed invention.

On or around September 17, 2014, DODOcase launched its V1.2 Viewer, which included a capacitive/conductive touch button rather than Google's magnet switch. EX2033, ¶7; EX2004, ¶35. The V1.2 Viewer was available for sale at www.dodocase.com, and readily accessible to Google and its team members who were in regular communication with Mr. Buckley regarding DODOcase's product development. EX2033, ¶32. In October of 2014, Regan Arts published a book titled *Beginner's Guide to Virtual Reality*, which was packaged with the V1.2 Viewer, resulting in 50,000 units shipped to customers across the United States. *Id.*, ¶ 33; EX2004, ¶ 36. Based on Mr. Buckley's present recollection, those V1.2 Viewers were identified as "Patent Pending." EX2033, ¶¶ 9, 33; EX2036 at DDC_018348. DODOcase (through Mr. Buckley) made numerous public disclosures regarding the V1.2 Viewer through videos posted to YouTube, speeches, and news articles. EX2033, ¶34. DODOcase became recognized globally in the industry. *Id.*, ¶ 35. As set forth in the Second Declaration of Patrick Buckley, between September 17, 2014 and May 10, 2015, sales of the Version 1.2 Viewer ("Virtual Reality Carboard Toolkit – V1.2") generated \$67,639.45 of revenue. EX2054, Buckley Decl. ¶18; EX2055 (Google Analytics Report). Moreover, between September 17, 2014 and May 10, 2015, \$216,815.20 of revenue was generated from sales of "Virtual Reality Cardboard Toolkit." EX2054, Buckley Decl. ¶18; EX2055 (Google Analytics

Report). This corresponded to nearly 10,000 unique sales. EX2054, Buckley Decl.

¶19; EX2056 (Google Analytics Report).

Google was well aware of DODOcase's activities as evidenced by an October 13, 2014, email from Mr. Nartker to Mr. Buckley stating: "Congrats on the Fry's placement! We just received a v1.2 unit [DODOcase V1.2 Viewer] as well; really neat." EX2035; EX2033, ¶ 8. Yet, Google did not create a product based on a combination of Kondo and Chu, despite both patents having been available since 2013, but instead opted to copy Mr. Buckley and the disclosures of the '075 patent. Google's suggestion that a POSA would be motivated to combine Kondo and Chu – when Google itself never considered combining those two references (despite making some efforts to develop a conductive/capacitive button) – is clear hindsight bias inconsistent with the actual efforts of those in the industry attempting to resolve the long-felt need.

On August 27, 2015, Google sent an email stating: "We are excited to share with you that the V2 Manufacturer's Guide is now available! We strongly encourage any future production on your side to implement the new V2 guide. I have attached the V2 Manufacturer's Guide to this email for your convenience." EX2043 at 1.

Thus, at least as early as August 2015, Google was strongly encouraging manufacturers to abandon the GCV1 Viewer in favor of the new GCV2 Viewer

(which possessed DODOcase's ultimately patented features) (EX2004, ¶¶55-65), knowing at the time that patent protection was being pursued by DODOcase for that technology. Google's direct communications with DODOcase regarding DODOcase's own viewer ceased.

Google's public statements suggest version 1 cardboard VR with magnet input was selling at ~250,000 units per quarter in the one-year period from Q2 2014 launch to Q2 2015. EX2054, ¶20; EX2057. Google's public statements also appear to indicate that v2 VR cardboard with capacitive mechanism sold ~2 million units per quarter after its launch in Q3 and Q4 2015 (EX2054, ¶20; EX2058), representing nearly a 10x increase over the magnet input version of the product. From Q1 2016 to Q1 2017, Google statements also show that on average ~1 million units per quarter of v2 VR cardboard with capacitive button mechanism were sold (EX2054, ¶20; EX2059), totaling 1 million V1 VR cardboard with magnet input products sold in first year of product launch and 9 million V2 VR cardboard with capacitive button units sold in first 1.5 years of product launch. Since Google's V2 viewer copied DODOcase's V1.2 capacitive button mechanism, Google's greatly increased commercial success provides objective indicia of nonobviousness.

Moreover, in February 2015, a partnership between Google and Mattel was announced relating to a View-Master VR Viewer. EX2066; EX2054, ¶¶24-25. The

Mattel VR View-Master included a capacitive button similar to DODOcase's.

EX2054, ¶¶25-26; EX2067 (showing the operation of the capacitive button of the Mattel View-Master Virtual Reality Headset). Based on information announced regarding the partnership, it apparently began in approximately September 2014, about two months after Mr. Buckley disclosed DODOcase's capacitive button to Google. EX2054, ¶26. This demonstrates that Google not only quickly moved to copy DODOcase's capacitive button itself, but it also induced others to do the same. *Id.*

In sum, there was a long-felt need in the art for an improved input mechanism. This need was met by DODOcase's commercial product. Google, the leading driver of smartphone-type VR viewers, praised DODOcase's input mechanism. EX2054, ¶21. Then they copied the DODOcase patented feature and had commercial success with the V2 Google product. *Id.* These objective indica of nonobviousness provide further reason for the Board to reject Petitioner's proposed grounds of obviousness for claim 1 of the '075 patent.

VII. Conclusion

For the foregoing reasons, all grounds of the petition should be denied.

Dated: January 31, 2024

Respectfully submitted,

/Cortney S. Alexander/

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Patent Owner certifies that the foregoing Patent Owner's Preliminary Response contains 13,696 words, excluding the portions exempted by 37 C.F.R. § 42.24(a)(1), as measured by the word-processing software used to prepare the document.

/Cortney S. Alexander/
Reg. No. 54,778

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a) and (b), I certify that on the date indicated below, a true and accurate copy of the foregoing document was served on the following counsel for Petitioner via e-mail, pursuant to Petitioner's consent to e-mail service:

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