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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

FLATFROG LABORATORIES AB, Plaintiff, v. PROMETHEAN LTD. AND PROMETHEAN INC., Defendants.	**REDACTED PUBLIC VERSION** C.A. No. 19-2246-MN DEMAND FOR JURY TRIAL

JOINT CLAIM CONSTRUCTION BRIEF

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JEX-02	U.S. Patent No. 10,739,916
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JEX-04	Webster's Ninth New Collegiate Dictionary
JEX-05	Declaration of Darran R. Cairns, In Support of Defendants' Responsive Claim Construction Brief (August 16, 2021)
JEX-06	McCraw-Hill Dictionary of Scientific and Technical Terms
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I. INTRODUCTORY STATEMENTS

A. FlatFrog's Introductory Statement

For nearly fifteen years, FlatFrog has been an industry-recognized innovator of interactive large touchscreen technologies. FlatFrog launched its now patented InGlass™ products in 2016, which rapidly gained impressive market share and a reputation for best-in-class performance. FlatFrog's technology allows large touchscreens to accurately detect a user's interaction with it and provide a true "pen-on-paper" experience that feels as natural to the user as writing on a sheet of paper.[1] InGlass was quickly adopted by the world's leading touchscreen display companies, including Samsung, Sharp, Dell, NEC, LG, and Defendant Promethean. FlatFrog's customers, including Promethean, touted InGlass and its performance as providing, among other benefits, an improved writing experience that looks and feels natural and the ability for several users to work interactively and simultaneously.

FlatFrog's patented technology works by passing beams of infrared light over the surface of the touchscreen and detecting when an object, such as a finger or a stylus, blocks the passage of infrared light over the surface of the touchscreen. One key to the performance of these systems is how closely the infrared light can be passed above the surface of the touchscreen (also referred to as the "glass"). The distance the light travels above the glass is referred to as the "contact detection height," or CDH, which is the height at which an object (e.g., a stylus) is detected as a "touch." The lower the CDH, the better the performance and the more natural the writing experience. Writing with a traditional pen-on-paper would be equivalent to having a zero CDH because the pen must actually contact the paper in order to lay ink upon its surface. FlatFrog's InGlass outperforms competing technologies based on FlatFrog's discovery, in 2015, that using a

[1] A demo of FlatFrog's technology can be viewed at https://youtu.be/SWh9v9tfpnE

concave touch surface affords unexpected benefits and allows the infrared light to closely skim the surface of the glass, providing the industry's lowest CDH. This concept is depicted in Figure 11b of the '935 patent:

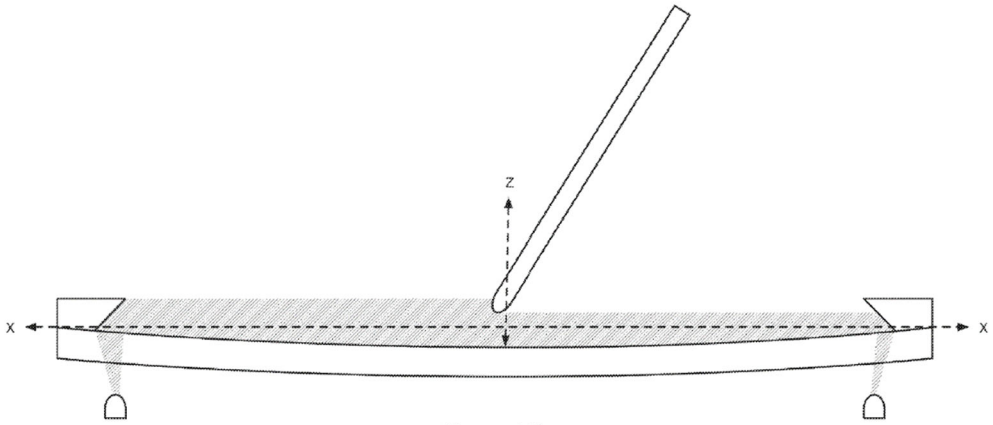


Figure 11b

Additionally, FlatFrog has learned over the past fifteen years through its research and development efforts that using infrared light for contact detection in a large touchscreen requires the precision alignment of multiple components. For example, Figure 2 from the '916 patent depicts an exemplary alignment and arrangement between the frame (110), emitters and detectors (103, 103'), sealing window (126), and the glass plate (101) along the edge of the display:

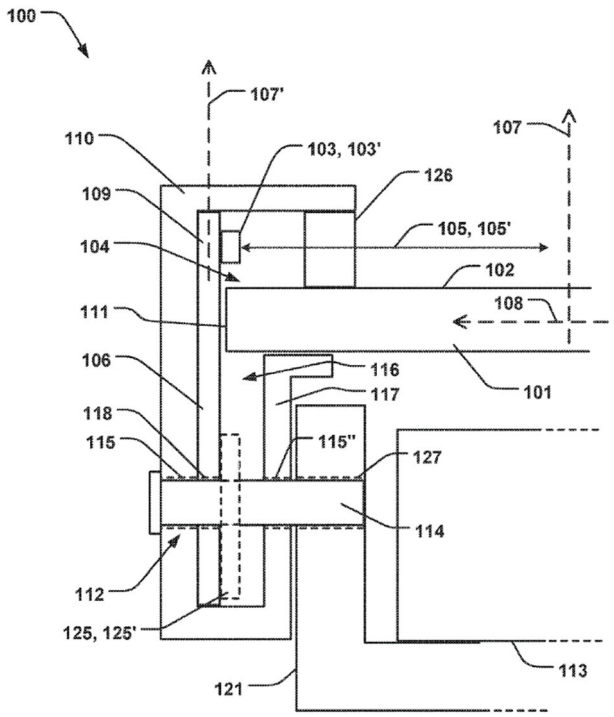


FIG. 2

FlatFrog's pioneering innovations cover not only the use of a curved touch surface, but also the technology that enables the incorporation of a curved touch surface into a mass-produced device.

Promethean quickly incorporated and proudly touted FlatFrog's InGlass technology in Promethean's touchscreen products. But in 2019, Promethean abruptly dropped FlatFrog and InGlass in lieu of cheaper, infringing alternatives from a Chinese supplier. Promethean had been working with an alternative supplier to duplicate FlatFrog's patented innovations and then demanded FlatFrog to drop its prices 50-80% to compete (against FlatFrog's own innovations), which FlatFrog could not do without losing its R&D investments. Promethean's "next" model duplicated FlatFrog's innovations and is the now accused infringing device, the AP7.

The parties stipulated to constructions for four claim terms. *See* ECF No. 89 at 2. Beyond those, FlatFrog believes there are only three additional terms that need construction by the court

to assist the jury with deciding this case. Promethean, however, seeks to burden the court with many more claim terms, including terms with non-technical words that have commonly understood meanings that need no construction (such as "projection," "downwards," and "fitted"). Many of Promethean's proposed constructions lard up otherwise concise and clear claim language by importing additional language into the claims. Promethean's remaining contention that it cannot understand the scope of the claims, and that they are indefinite, rings hollow. FlatFrog taught Promethean everything it now knows about how to build and design the infringing products, which are mere knockoffs of FlatFrog's own products and innovations described and claimed in its patents.

The three terms proposed for construction by FlatFrog are listed in the following chart, identified by their term number in the parties' Joint Claim Construction Chart (ECF No. 89) and addressed in detail below.

	Term	**Patent**
17	wherein the plate has a first curvature in the touch surface when not installed in the frame assembly, and wherein the plate has a second curvature along the width and along the length in the touch surface when the plate is installed in the frame assembly	'935 patent
3	optical element	'916 patent
6	supported by	'916 patent

B. Promethean's Introductory Statement

Plaintiff filed this suit, asserting infringement of three patents. When Defendants produced invalidating prior art, Plaintiff statutorily disclaimed all three patents. Plaintiff then amended its complaint to assert infringement of continuations of the disclaimed patents. Virtually all of Plaintiff's introductory story about its "inventions" in the now-asserted patents applies equally to

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the statutorily disclaimed patents and the prior art. Missing from that story is that Defendants, not Plaintiff, have been global leaders in the interactive touchscreen display panel industry, selling concave glass prior art active panel products as early as 2014—long before Plaintiff began supplying components to panels Defendants introduced in 2016.

Plaintiff's proposed constructions are divorced from ordinary meaning, do not reflect the intrinsic evidence, and would require the Court to rewrite claims. Moreover, Plaintiff's decision to not support many of its positions in its Opening Brief conflicts with the Scheduling Order and should result in a waiver of the majority of Plaintiff's positions. As a result, and as more fully described herein, Defendants respectfully request that the Court adopt Defendants' constructions.

C. FlatFrog's Reply to Promethean's Introductory Statement

Promethean's constructions inject unnecessary words into clear and concise claim language, and also improperly import limitations from certain described embodiments. But claim construction is not a process for redrafting the claims. Promethean also urges the Court to resort to *extrinsic* evidence, but that would be improper because the *intrinsic* evidence clearly defines the scope of the invention and claims. Promethean's criticism of FlatFrog's "decision to not support many of its [plain meaning] positions in its Opening Brief" rings hollow when Promethean revised so many of its constructions between submission of the joint chart and its opening brief and because FlatFrog could not practically or effectively explain why plain meaning is appropriate before Promethean laid out its arguments to the contrary.

II. AGREED-UPON CONSTRUCTIONS

Term (Patent, Claim)	Agreed Construction
"curvature" ('935 patent, claims 1 and 7)	the amount, if any, by which a line or surface deviates from a straight line or a flat surface
"element" ('916 patent, claim 1)	No construction needed.

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"a mating portion having a second cross-section shape that is substantially reciprocal to the first cross-sectional shape" ('916 patent, claim 1)	a mating portion has a second cross-sectional shape that is configured so that the mating portion can be received within the gap
"touch sensing apparatus of claim 3, wherein the first curvature and the second curvature" ('935 patent, claims 4, 5, and 6)	No construction needed.

III. DISPUTED CLAIM CONSTRUCTIONS

A. U.S. Patent No. 10,775,935

1. FlatFrog's Overview of the '935 ("warp glass") patent

The '935 patent is directed to a touchscreen display having an "assembly for holding and controlling curvature of a glass plate." '935 patent (JEX-01), Abstract. The "plate" referred to here is the glass plate a user interacts with on a touchscreen device—or simply the touchscreen itself. The patent also discloses "a method for assembling a plate of an optical touch sensitive system with a panel (such as a display panel) in such a way that curvature is controlled." *Id.* at 1:20-22.

The basic operation of optical touchscreen displays relies on sending infrared light over the surface of a touchscreen and detecting when the light is blocked by a user interacting with the touchscreen through a finger, hand, or stylus. *See, e.g.*, *id.* at 15:47-16:3. The light is sent by a device called an "emitter," and detected on the other end by a device called a "detector." *Id.* When the path of the light is blocked between an emitter and a detector, the system registers this as a touch. *Id.*

As explained in the patent, transmitting beams of light closer to the surface of the touchscreen allows for "significant improvements in accuracy." *Id.* at 1:49-55. However, "[i]n

systems where the light is directed closer to the touch surface, distortions in the plate have a disproportionally large effect on the light signal." *Id.* at 1:56-59. For example, the light may hit a distortion in the touch surface (such as a twist, curve, or bump) that blocks the light. Such distortions in the surface of the plate can result from the plate manufacturing process (e.g., a plate that is substantially, as opposed to entirely, flat) or be caused when the plate is installed within the frame assembly during the product assembly process. *Id.* at 1:64-2:17. Thus, "an improved frame assembly for holding a plate of an optical touch sensitive system relative to a panel would be advantageous and in particular allowing for improved precision, increased compactness, cost-effectiveness, and/or controlled curvature would be advantageous." *Id.* at 2:18-22. The curvature of the plate may be controlled to be either flat "or slightly concave as seen from the touch surface." *Id.* at 5:63-67. The key is to avoid convexity in the plate (*id.* at 5:67-6:2), because a convex plate blocks the path of light sent close to the surface of the plate. By controlling the curvature of the plate to result in a concave surface when installed in the frame assembly, FlatFrog discovered that "the sensitivity of the system may be even further improved." *Id.* at 8:35-38. The '935 patent also discloses embodiments where the frame assembly controls the plate to have a parabolic concave curvature when installed within the frame assembly and describes the discovery of certain additional benefits when a parabolic concave curvature is achieved. *See, e.g.*, *id.* at 16:18-18:8.

2. "configuring the frame assembly to support the plate includes inducing a parabolic curvature in the touch surface" (claim 1 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction (REVISED)
No construction needed	assembling the plate into the frame assembly so that the frame assembly applies a force to the plate that causes the formation of a parabolic curvature in the touch surface, wherein, prior to the assembly of the plate into the frame assembly, the plate does not

	have an inherent curvature greater than the parabolic curvature

a. FlatFrog's Opening Position

Although Promethean insists this phrase must be construed, FlatFrog disagrees and sees no basis to impose, for example, unclaimed restrictions on the curvature of the plate before installation in the frame assembly. Once Promethean articulates its argument and reasoning for its position, FlatFrog will respond in its reply brief.

b. Promethean's Answering Position

Defendants' proposal (REVISED): assembling the plate into the frame assembly so that the frame assembly applies a force to the plate that causes the formation of a parabolic curvature in the touch surface, wherein, prior to the assembly of the plate into the frame assembly, the plate does not have an inherent curvature greater than the parabolic curvature.

The parties dispute whether (1) including the "inducing" step into the "configuring" step requires that the plate's assembly into the frame causes the curvature inducement, and (2) the patent disavows the plate having an inherent curvature greater than the claimed parabolic curvature prior to that assembly.

Regarding the first dispute, the word "configuring" ordinarily would refer to specifically designing the frame to support the plate, without requiring assembly of the plate into the frame. *See Webster's Ninth New Collegiate Dictionary* 275 (JEX-04) (defining "configure" as "to set up for operation esp. in a particular way") (hereinafter "Webster's"); *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (equating "configured to" with "made to" and "designed to," contrasted with broader "capable of"). However, including "inducing a parabolic curvature in the touch surface" into the "configuring" phrase requires action upon the plate and, thereby, ***is not consistent with that ordinary meaning***. *See Irdeto Access, Inc. v.*

Echostar Satellite Corp., 383 F.3d 1295, 1300 (Fed. Cir. 2004) (claim term construed "only as broadly as provided for by the patent itself" absent an ordinarily understood meaning in the art). Thus, the POSA would understand that the "configuring" step requires the plate's assembly into the frame.

Additionally, the claim language and written description require causation between the frame assembly and inducing parabolic curvature in the touch surface. By "includ[ing]" inducement as part of "configuring" the frame assembly, the claim language requires that the frame assembly's configuration causes the parabolic curvature's formation. And, the specification is replete with discussion of the frame assembly's causation of curvature through the application of force. *See* '935 patent, 2:35-3:23; 5:60-6:29; 8:4-36; 8:49-56; 9:15-29; 9:37-13:54; 13:60-14:9; 16:4-8 (JEX-01).

Regarding the second dispute, the '935 patent disavows inducing a parabolic curvature to a plate that already has an inherent curvature greater than the induced parabolic curvature. In its background section, the patent presents the problem that it intends to solve: unpredictable twist in a lightweight frame and touch plate arising from the frame's fastening into the remainder of the touch sensing apparatus. '935 patent, 1:56-63; 6:7-13; Decl. at ¶¶ 13, 14 (JEX-05). Unpredictable twist is a problem for touch sensing apparatus because twist can cause plate convexity, which can create interference between the plate and a low-touch height light field above the plate. '935 patent, 1:64-2:4. In other words, twist makes the product not work properly. This problem arises when a lightweight frame and "usually flat" plate do not have sufficient inherent strength to withstand the unpredictable twist caused by fastening the frame into the apparatus or hanging the apparatus on a wall. '935 patent, 1:64-2:4; 6:7-13.

The specification recognizes the prior art's knowledge that assembling a curved plate into a bulky frame strong enough to reduce the plate's curvature introduces forces into the frame large enough to overcome the forces that otherwise would cause plate twist. '935 patent, 1:64-2:4; Decl. at ¶¶ 15, 16, 17. The specification then rejects that prior art knowledge as "unsuitable" and "insufficient" for the systems disclosed in the '935 patent. '935 patent, 2:9-17. The solution is insufficient because it would undermine the patent's use of compact, lightweight frames:

> However, such solutions are unsuitable/insufficient for touch sensitive systems since they typically require bulky frames at the border of the glass and/or pressure points closer to the center of the panel where force may be applied to control the shape of the glass. These solutions are unsuitable where a minimal/lightweight border bezel is required, and no supporting objects may touch the glass further in than the borders. Additionally, pre-bent glass is expensive and fragile to transport.

Id.; *see id.*, 2:18-22; 3:20-23; 8:32-35 (emphasizing the patent's objective of controlling curvature while simultaneously using a compact bezel and avoiding use of center supports). The specification's explanation is a positive statement that the prior art solution is unsuitable and insufficient for the systems the specification is about to disclose. Indeed, the specification then discloses a series of embodiments in which fasteners internal to the frame assembly create predetermined, predictable forces within the frame assembly to control the plate's curvature. '935 patent, 5:60-6:29; 8:4-36; 8:49-56; 9:15-29; 9:37-13:54; 13:60-14:9; 16:4-8; Decl. at ¶ 18. This allows the use of a glass plate either without change in its curvature or with a predictable change in its curvature. *Id.*, 5:60-63; 6:22-25; 8:13-30; 9:37-54; 9:57-64; 10:8-20; 11:5-18; 11:51-12:26; 13:20-54; 14:18-19. The '935 patent discloses no embodiment in which the frame assembly controls the glass plate's curvature by reducing the plate's inherent curvature. The '935 patent unmistakably disavows coverage of embodiments wherein, prior to the plate's assembly into the frame assembly, the plate has an inherent curvature greater than the final parabolic curvature.

c. FlatFrog's Reply Position

The '935 patent solved the prior art problem of uncontrolled curvature and describes inventive systems and methods in which the curvature of the plate (used for the touch surface) is controlled when integrating it into the frame assembly of the touchscreen device. '935 patent, 1:56-2:25. The curvature of that touch surface can be controlled to be flat, concave, parabolic, etc. *Id.* at 2:35-3:34. Claim 1 does not specify exactly how that curvature is induced, nor does it require that the frame assembly is what induces curvature (as Promethean contends).

Claim 1 recites a "method for assembling a touch sensing apparatus" that includes the step of "*configuring* the frame assembly to support the plate [which] *includes inducing* a parabolic curvature in the touch surface." This "configuring" step expressly includes "inducing a parabolic curvature in the touch surface." Thus, this recited step of configuring/assembling the "plate" into the claimed "frame assembly" is what controls the curvature of the plate and, in this instance, results in a "parabolic curvature" in the touch surface. Promethean's invitation to redraft a simple seventeen-word phrase into a 55-word phrase should be rejected.

FlatFrog agrees that the claim language requires that the recited "parabolic curvature" is induced by "configuring the frame assembly to support the plate"—that is its cause. Thus, using Promethean's words, the "plate's assembly into the frame" is what "causes the curvature inducement" (*supra*). Promethean's assertion that this is disputed (its alleged "first dispute") is thus incorrect. As a result, claim construction is unwarranted because (a) there is no genuine dispute, and (b) the claim clearly and concisely conveys this concept. *See, e.g.*, *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1372-73 (Fed. Cir. 2016); *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568-70 (Fed. Cir. 1997).

For its "second dispute," Promethean contends there has been a "disavowal" of certain post-assembly curvatures based on pre-assembly curvatures. Promethean is wrong. "The standard

for disavowal of claim scope is . . . exacting." *Thorner*, 669 F.3d at 1366. "Mere criticism of a particular embodiment encompassed in the plain meaning of a claim term is not sufficient." *Id.* Disavowal requires "expressions of manifest exclusion or restriction" to "represent[] a clear disavowal of claim scope." *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002); *see also Thorner*, 669 F.3d at 1366-67 ("To constitute disclaimer, there must be a clear and unmistakable disclaimer.").

Promethean's urged disavowal falls far short of these exacting standards. Nowhere does claim 1 restrict the initial curvature of the plate before it is installed in the frame assembly. The only requirement in claim 1 is that installation of the plate into the frame assembly induces a "parabolic curvature in the touch surface." No matter the starting curvature of the plate, the claim is met if installation in the frame assembly induces a "parabolic curvature."

Promethean identified nothing in the specification amounting to a "clear and unmistakable disclaimer." The '935 patent describes controlling the curvature of a touch surface, whereas the prior art systems failed to control the curvature and instead introduced uncontrolled warpage. '935 patent, 1:64-2:25. The patent explains that prior art devices using pre-bent glass, as in prior non-touchscreen systems, would not work with touchscreen systems because the prior devices were bulky and required supporting objects in the center of the plate. *Id.* at 2:5-16; *see also id.* at 3:22-23. This discussion is far from a disavowal of systems that control the curvature of the touch screen by reducing its inherent curvature. Promethean nevertheless asks the Court to find "unmistakabl[e] disavowal" because the patent discloses "no embodiment in which the frame assembly . . . reduc[es] the plate's inherent curvature." That is incorrect. The specification describes embodiments where the plate has a "substantially flat" (i.e., not flat) inherent curvature and then making it flat (*id.* at 5:62-67, 8:5-26)—thereby reducing the plate's inherent curvature.

Promethean's argument is also legally flawed because even if all embodiments increase the plate's inherent curvature (they do not), "[i]t is . . . not enough that the only embodiments, or all of the embodiments, contain a particular limitation." *Thorner*, 669 F.3d at 1366. It is also wrong as a matter of claim differentiation. Claim 3 expressly defines the "first curvature" (before configuration in the frame assembly), the "second curvature" (after configuration in the frame assembly), and the relationship between them (the second curvature is greater than the first). If Promethean's "disavowal" argument were adopted, claim 3 would be superfluous. *See, e.g.*, *Ortho-McNeil Pharm., Inc. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1362 (Fed. Cir. 2008) (rejecting construction that would render dependent claim meaningless); *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971-72 (Fed. Cir. 1999).

Promethean's construction also injects a new requirement that the frame assembly exert force to cause the inducement of curvature. However, the claim was drafted in the passive voice and imposes no requirement on which specific component(s) induce curvature or how it is induced. The claim encompasses embodiments in which other components (e.g., spacing elements) exert a force to induce the curvature. *See, e.g.*, '935 patent, 10:13-16. Or embodiments in which the force is exerted by gaskets, as in claims 12 and 13. *See, e.g.*, *id.* at 11:44-12:26.

d. Promethean's Sur-Reply Position

The parties agree that this term requires the assembly of the plate into the frame assembly. Plaintiff argues this means that the general assembly of the frame, not necessarily the frame itself, causes the parabolic curvature. Defendants assert that if the frame assembly's configuration "includes" inducing the parabolic curvature, the frame itself induces, i.e. causes the formation of, that curvature through a force between the frame and the plate. This understanding is consistent with the examples provided in the '935 specification. Plaintiff's reference to the use spacing elements such as gaskets ignores that the frame forces the plate against those elements.

Plaintiff argues gravity does not contribute to the claimed inducement. *Infra*, p. 21. Plaintiff is wrong. The frame causes the parabolic curvature's formation but will do so subject to the plate's internal structure and the environment in which the frame applies force to the plate. *See* Decl. at ¶¶ 21, 22 (JEX-05). Those factors cannot be ignored. For example, if a touch sensing apparatus has a horizontal plate, gravity is an integral part of the plate's curvature. Plaintiff alleges components other than the frame are considered but does not explain why gravity is not.

Plaintiff's opposition to the patent's disavowal of the use of pre-curved plates in the frame is also incorrect. The '935 specification does not merely disparage prior art methods of using pre-curved plates. The specification does not simply describe how to make the claimed invention using a preferred method. Instead, the specification states flatly that solutions relying on pre-curved glass plates "are unsuitable/insufficient for touch sensitive systems." The claims are directed to touch sensitive systems in which plates are installed in frames. It is difficult to imagine a more manifest expression of exclusion. *See Honeywell Int'l, Inc. v. ITT Industrials, Inc.*, 452 F.3d 1312, 1319-20 (Fed. Cir. 2006) (finding disavowal because specification "informed … readers specifically why carbon fibers would not be suitable as 'electrically conductive fibers'").

Plaintiff mischaracterizes the subject matter Defendants assert as disavowed as being bulky frames and center supports. However, the specification's explicit disavowal is to "[s]uch solutions [that] include pre-bent glass in order to control warpage." '935 patent, 2:7-8. The specification recites reasons the use of pre-curved plates is unsuitable, i.e. because their use typically requires a bulky frame or a center support and because of the expense and fragility of pre-curved glass in transport, *see id.*, 2:7-17, but the disavowal is to the reduction of the pre-curved plate's curvature.

Plaintiff incorrectly states that the '935 patent discloses the reduction of curvature in pre-curved plates. For example, Plaintiff cites a reference to a "substantially flat" plate and, then, to

embodiments of Figures 3a-3d in which frame support portions 101a, 101b control the plate to be in a "flat plane," *id.*, 8:13-18, implying that a "substantially" flat plate is changed to an ideally flat plate. But the specification explains that no plate is ideally flat. *Id.*, 18:45-49. The specification provides no guidance as to the boundaries of "flat," e.g. also describing, at 9:39-45, the frame support portions of Figure 3a that control the plate to the allegedly ideal "flat" plane as being "substantially flat." Plaintiff's attempt to cast this description as specifically referring to a pre-curvature that is reduced to an ideal curvature is without merit.

Plaintiff's claim differentiation argument fails at least because a patentee cannot use claim differentiation, and here through the presentation of later-filed claims, to change the meaning of terms as required by the specification. *See MarcTec, LLC v. Johnson & Johnson*, 394 Fed. Appx. 685, 687 (Fed. Cir. 2010) (finding claim differentiation cannot broaden claim beyond correct scope as determined in light of specification, prosecution history, and relevant extrinsic evidence).

3. "curvature in the touch surface" (claim 1) / "curvature . . . after the plate is configured in the frame assembly" (claim 3) / "second curvature . . . in the touch surface when the plate is installed in the frame assembly" (claim 7 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
No construction needed	The curvature in the touch surface, measured when the touch sensing apparatus is in its operative orientation, extends from one side of the touch surface to an opposite side of the touch surface

a. FlatFrog's Opening Position

Promethean asserts that this phrase must be construed, but FlatFrog sees no basis to import unclaimed restrictions concerning "operative orientation" or how the curvature must be measured. After Promethean has articulated its argument and reasoning for its position, FlatFrog will respond in its reply brief.

b. Promethean's Answering Position

Fundamentally, the parties' dispute relates to the fact that the touch panel's curvature changes when measured vertically or horizontally and may depend on where it is measured. Thus, the same product or prior art could be covered by the claims or not, depending on whether it is measured vertically or horizontally, and where the measurements are made. Defendants' proposal aligns with these truisms.

The disputes arise because the claim language requires measuring an attribute (i.e., the touch surface curvature) but fails to identify which of multiple possible measurement methods should be used. Construction is required to determine whether the resulting ambiguity renders the claims indefinite or, instead, the specification conveys to the POSA what the measurement method should be. *See Honeywell Int'l, Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 1339-40 (Fed. Cir. 2003) (finding patent's intrinsic record did not support narrowing claim construction to one of multiple possible methods, so that bounds of invention were indiscernible). Defendants submit that the '935 specification defines how the measurement should be made.

Regarding the first dispute, Plaintiff cannot reasonably debate that the touch sensing apparatus' orientation can determine the curvature of a plate secured by a frame assembly because gravity's impact on plate curvature varies with that orientation. Decl. at ¶¶ 20-22 (JEX-05). Plaintiff recognizes gravity's effect on touch plates in its Touch and Pen Kit Product Specification DA-TKxP-20P1-M3 ("FlatFrog Product Spec"). *Id.* at Ex. B. Redacted

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The FlatFrog Product Spec shows that measuring in vertical versus horizontal orientation is outcome-determinative with regard to claim 1. To illustrate, claim 1 requires a parabolic curvature. The FlatFrog Product Spec shows that a touch sensing apparatus may be assembled with a substantially flat glass plate (that does not have a parabolic curvature). The patent also explains that substantially flat glass may be assembled into a frame assembly that maintains that glass's flat curvature. '935 patent, 5:62-63; 8:13-19; 9:37-54; 9:57-64. The patent provides and the FlatFrog Product Spec shows that a touch sensing apparatus may be assembled with a glass plate that, when measured vertically, does not have a parabolic curvature, but meets every other limitation of claim 1. *See id.*, 16:36-38 (disclosing that curvature can be assessed when the touch panel is "vertically-oriented"). This vertically-oriented apparatus would not be covered by the claim.

However, if that above apparatus with the substantially flat glass were oriented horizontally, gravity can induce a concave curvature in the touch surface due to principles applying to beam displacement. Decl. at ¶¶ 20-22. When such glass plate is held by the frame at its edges without interior support, gravity tends to induce a parabolic curvature, such that the substantially flat touch surface when vertical naturally forms a parabolic curvature when horizontal. Decl. at ¶¶ 21-22. Thus, in contrast to the vertical orientation above, the horizontally-oriented apparatus could be covered by the claim. While a variety of factors influence the degree of the parabolic deformation, the FlatFrog Product Spec acknowledges that glass plates in touch screen apparatus can be subject to material displacements from gravity. Decl. at ¶ 22. Thus, the choice of a touch sensing apparatus' orientation can be outcome-determinative with regard to claim 1.

Measuring in vertical versus horizontal orientation also is outcome-determinative with regard to claim 3. Claim 3 depends from claim 1 and requires that the in-frame curvature be greater than the out-of-frame curvature. '935 patent, claim 3. If a substantially flat glass plate is oriented vertically, the plate's in-frame curvature would not be greater than its out-of-frame curvature. Thus, even if the apparatus met all of the other limitations of claim 3, it would not be covered by the claim. However, if that same apparatus were measured horizontally, gravity could induce a parabolic curvature, making the in-frame curvature greater than the out-of-frame curvature and triggering coverage by the claim. Thus, the choice of a touch sensing apparatus' orientation can be outcome-determinative with regard to claim 3.

Claim 7 requires that the touch surface's out-of-frame curvature be concave and that its in-frame curvature be parabolic. Defendants examined two prior art touch sensing apparatus in which these conditions are met both when the in-frame curvature is measured for the apparatus in a vertical position and in a horizontal position. Decl. at ¶¶ 23-33. However, based on the principle of superposition as it applies to beam displacement, if the frame were to control the plate's curvature to a substantially flat state when vertical (not covered by the claim), gravity could induce a parabolic curvature in the touch surface when the plate is oriented horizontally (covered by the claim). Decl. at ¶¶ 28, 29. As a result, the choice of a touch sensing apparatus' orientation can be outcome-determinative with regard to claim 7.

Regarding the second dispute, selecting the location on the touch surface or plate at which to measure for a parabolic curvature can be outcome-determinative. The curvatures for claims 1 and 7 must be parabolic. Figures 11c and 11d illustrate examples of parabolic curvatures in the touch surface. '935 patent, 16:18-35. The specification appears to presume that curvature is considered from one side of the plate to the other, rather than in any particular subsection thereof.

For instance, in Figure 11d, the curve would not be considered parabolic if the curvature is considered only between the points indicated at "X" and "Y."

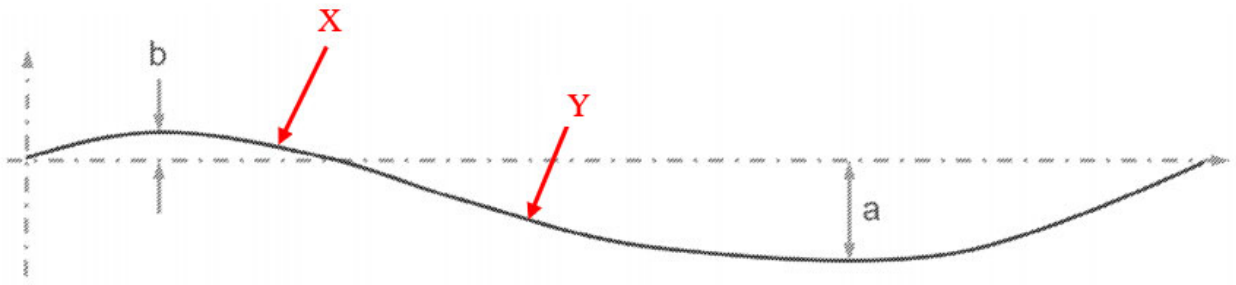


Figure 11d

Similarly, while the specification indicates, at 18:50-57, that curve 1810 in Figure 18a is parabolic, the specification appears to reach that result based on assessing curvature from one side of the plate to the other. The section of line 1810 appears linear between the 200mm and 800mm points, such that considering only that section might not be parabolic. As noted, claim 3 requires that the plate's in-frame curvature be greater than its out-of-frame curvature. Figure 18a illustrates the potentially outcome-determinative impact of deciding where to measure the curvature, in that measuring from one side of the plate to the other results in a curvature much larger than the linear, or near linear, curvature from 200mm to 800mm. Thus, under Plaintiff's proposal, the choice of location when measuring plate or touch screen curvature is outcome-determinative.

Regarding indefiniteness, claims 1, 3, and 7 are directed to an attribute, the measurement of which is subject to multiple, outcome-determinative methods, without identifying which method is to be used. Thus, the claims would be indefinite unless the specification conveys the applicable method. *See Honeywell*, 341 F.3d at 1340-41 (finding claim indefinite where specification failed to provide sample preparation method for PET yarn); *Saso Golf, Inc. v. Nike, Inc.*, 843 Fed. Appx. 291, 296-298 (Fed. Cir. Feb. 10, 2021) (finding claims indefinite where specification failed to

provide method for measuring curvature of golf club head) (nonprecedential). In this case, the specification does indicate how the apparatus should be measured, both with respect to apparatus orientation and measurement location. In particular, it focuses on solving the problem of touch plate twist. '935 patent, 1:56-2:4; 5:60-6:2; 6:7-11; 6:14-18; 8:13-30; 16:28-35; 16:36-42. That context is relevant only when the device is in operation, in its operative position. Therefore, the curvature measurement should be made with the device in its operative position. *See id.*, 16:36-38 (referring to distance range "for a vertically oriented touch plate," i.e. a touch plate in its operative orientation); 6:7-13 (describing prior art problem of frame twist in context of VESA standard wall, i.e. vertical, mounts). Also, as noted, the patent directs touch surface and plate measurement to be made entirely across the touch surface, from one side to another. Every touch surface curvature presented in the specification is measured entirely across the touch surface.

Because of the specification's teaching, the phrases should not cause their respective claims to be indefinite but should be construed as referring to a touch surface or plate curvature, as applicable, measured when the touch sensing apparatus is in its operative position, extending from one side of the touch surface to an opposite side of the touch surface.

c. FlatFrog's Reply Position

Promethean contends the Court must construe these "curvature" elements to restrict where the induced curvature must be measured to allegedly save these claims from indefiniteness. To be clear, however, Promethean does not ask this Court to find these terms indefinite.[2] And Promethean's narrowing constructions are unwarranted.

[2] If Promethean were to later argue these terms are indefinite, FlatFrog would request the opportunity to submit additional argument and expert evidence.

First, Promethean contends the induced curvature must be measured with a specific product orientation because gravity "may induce" a curvature in the plate. But claim 1 is expressly directed to curvature induced by integration with the frame assembly, not gravity. It is irrelevant (and by no means outcome determinative, as Promethean contends) that other forces, such as gravity or a user's finger, may induce other curvatures in the touch surface. The patent is directed to controlling curvature induced by integration with the frame assembly, not other forces. Moreover, Promethean's proposed construction will inject more ambiguity by importing an "operative" element nowhere recited in the claims.

Second, Promethean contends the induced curvature must extend from edge-to-edge of the touch surface. Again, Promethean is mistaken and these claim elements are not so limited. The specification and the claims are directed to inducing parabolic curvatures in a touch surface during assembly of the touch device. The claims, as drafted, already provide details as to where on the touch surface the claimed assemblies may induce such curvatures. For example, independent claim 1 provides that the induced curvature may exist: "relative to a first axis and relative to a second axis perpendicular to the first axis, said first axis is parallel to a line between the first end point and the second end point and said second axis is parallel to a line between the second end point and the third end point." Independent claim 7 provides the induced curvature exists "along the width and along the length."

It would be improper to impose an "edge-to-edge" requirement when the claims expressly define the location on the touch surface where the curvature is induced. And dependent claims provide further examples where the induced curvature is measured: claims 4 and 9 ("along an edge"), claims 5 and 10 ("along an axis passing through a center point of the plate"), and claims 6 and 11 ("along a line passing through a point on the touch surface"). It would thus be error to

import an "edge-to-edge" requirement simply because, as Promethean argues, the specification "*appears* to *presume* that curvature is considered from one side of the plate to the other." *Supra* (emphasis added).

Nor do Promethean's cases mandate its construction. In *Honeywell*, the parties disputed which of four methods of measuring the "melting point elevation" should be used when the measurement could "vary greatly" depending on the method used. 341 F.3d at 1336. Here, the parties do not dispute which measuring method should be used to measure the curvature. Rather, the parties dispute where the curvature may be induced. And even if this were viewed as a dispute over measurement, it only concerns which endpoints should be used for the measurement. "[B]readth is not indefiniteness." *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1367 (Fed. Cir. 2017). Considering the specification, inducing controlled curvature is the advance over the prior art, not methods of measuring.

Nor is this a case governed by *Saso*, a non-precedential decision. There, the claims defined curvature by reference to two points on a golf club: the "toe" and the "heel." 843 Fed. App'x at 292-93. But an artisan would not have known the location of the "toe" and the "heel," so the claims were held indefinite. *Id*. at 296-97. Here, unlike *Saso*, the claims do not define the curvature by reference to two undefined points. Rather, the claims cover any parabolic curvature in the touch surface at the locations indicated in the claims.

d. Promethean's Sur-Reply Position

Plaintiff contends Defendants are wrong that the plate's curvature must be measured when the plate is in its operative position primarily because measurement of a "parabolic curvature" should ignore gravity's effects. Plaintiff is wrong in excluding gravity, as Defendants explain above. Plaintiff also opposes Defendants' construction calling for the "operative" position. The basis for the "operative" limitation is addressed in Defendants' answering brief.

Plaintiff also challenges Defendants' construction that the curvature should be measured edge-to-edge on grounds that certain dependent claims specifically locate lines on the touch surface at which curvature should be measured. However, the issue is where to start and stop a measurement on such a line, not the line itself. Moreover, the specification conveys that the curvature *must* be measured from plate edge to plate edge. Not only is that true of every touch surface curvature the patent discloses, the patent's written description presumes it. For example, the definitions of maximum concavity and convexity in the patent's Figure 11d and the example table at 19:9-24 would be irrelevant if the measurement line could be arbitrarily defined across the plate. The purpose of defining maximum convexity is to assure that no convex portion of the line interferes with the infrared light field. *See* '935 patent, 16:29-33. That makes sense only if the line subject to the maximum convexity limitation extends *entirely across the plate*.

4. "parabolic curvature in the touch surface" (claim 1) / "curvature [in the touch surface] is parabolic" (claim 7 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction (REVISED)
No construction needed. If the Court determines that a construction is needed, then "parabolic" should be construed as "substantially parabolic."	The curvature in the touch surface conforms to a mathematical parabola that bows toward the display panel and does not vary from the mathematical parabola by more than 0.5mm.

a. FlatFrog's Opening Position

Promethean asserts that this phrase must be construed, but FlatFrog sees no basis to import unclaimed restrictions concerning a "mathematical parabola" or a hard numerical limit on a curvature's deviation therefrom. After Promethean has articulated its argument and reasoning for its position, FlatFrog will respond in its reply brief.

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b. Promethean's Answering Position

Defendants' proposal (REVISED): The curvature in the touch surface conforms to a mathematical parabola that bows toward the display panel and does not vary from the mathematical parabola by more than 0.5mm.

By using a term of degree inconsistently with its ordinary meaning, the patentee limits the term to the specification's disclosure of both mathematical parabola and a 0.5mm deviation from that mathematical parabola. Defendants' proposal is supported by the patentee's approach, the specification, and the law. Plaintiff prefers to ignore that support, leading to the parties' dispute whether the claims (1) require the plate or touch surface to conform to a concave mathematical parabola that bows toward the display panel and (2) define the curvature's allowable deviation from a mathematical parabola by a 0.5mm variation.

There is no special meaning of a "parabolic" curvature for touch surfaces in the art of touch sensing devices. Decl. at ¶ 36 (JEX-05). Further, the POSA would not comprehend any ordinary meaning of a parabolic curvature from the specification. In the absence of an ordinarily understood meaning, the term is defined by the specification's bounds. *See Irdeto*, 383 F.3d at 1300.

Except for disclosure of certain specific examples, the specification fails to provide guidance to understand the term's scope. The POSA would understand an "ideal" or "mathematical" or "mathematically defined" parabola to mean a plane curve given by an equation in the form of $y = ax^2 + bx + c$, where x is a variable and a, b, and c are constants (referred to herein as a "mathematical parabola"). *See* '935 patent, 16:55-62; 17:26-47; 18:50-19:48; *McGraw-Hill Dictionary of Scientific and Technical Terms* 1525 (6th ed. 2003) (JEX-06) (hereinafter "McGraw-Hill"); Decl. at ¶ 36. The specification states that the claimed parabolic curvatures cannot be mathematically parabolic, thereby defining the "parabolic curvatures" as "real-world" parabolic curvatures, rather than mathematical parabolas. '935 patent, 18:45-19:48. Since the specification

defines a "parabolic" curvature in terms of its variability from a "mathematical" parabola, "parabolic" is a term of degree, where the "degree" is the degree to which the real-world parabolic curvature varies from a mathematical parabola.

Having used a term of degree, the specification then uses it inconsistently with any understanding of a parabola. The examples the specification provides of "parabolic" curvatures allow such a high degree of variation from mathematical parabolas that the "real-world" parabolic curvature need have little, if any, shape similarity to an actual parabola. Decl. at ¶ 37; '935 patent, 18:50-20:65; Figs. 18a-21d. The '935 patent presents the examples with respect to a table, at 19:9-28, that identifies six applicable parameters. Of these, only the sixth, maximum parabolic deviation, refers to the shape of the "parabolic" curve. The sixth parameter describes how much any point on an actual touch surface curve can deviate from a parabolic curve. The table consistently applies a 0.5mm allowable deviation, regardless of the size of the touch plate or the depth of the curvature in the plate. Decl. at ¶ 37. Accordingly, the '935 patent accepts as a parabolic curvature any touch surface curvature with less than 0.5mm deviation between a best fit parabolic curve and the measured data. *Id*. But because the examples encompass curvatures less than a maximum 0.5mm depth, the examples include possible deviations from a parabolic shape of 100% or more, even including a straight line. The skilled person would not consider the term "parabolic" curvature to encompass a straight line or other such significant deviations from a parabola. Thus, the POSA would not comprehend an ordinary meaning of a "parabolic" curvature in the context of the '935 patent's specification. Decl. at ¶ 37. Under such conditions, the claim term is properly construed to the bounds of the specification's disclosure. *See Irdeto*, 383 F.3d at 1300; *Iridescent Networks, Inc. v. AT&T Mobility, LLC*, 933 F.3d 1345, 1349-51, 1353-54 (Fed.

Cir. 2019) (finding term of degree limited to parameter values provided in specification drawing where claim term had no ordinary and customary meaning in the art).

However, the specification fails to provide meaningful guidance to the boundaries of "parabolic" beyond the specification's specific examples. Those examples bound the term by (1) defining a "real-world" parabolic curvature in terms of conforming to a best fit mathematical parabolic shape, (2) allowing deviation from the mathematical parabolic shape by up to 0.5 mm, and (3) requiring that the "parabolic" curvature be concave. First, the specification's examples indicate that the patent defines a "real world" parabolic curvature by first determining the closest parabola that fits data measured from the actual touch surface curvature. This is apparent from the lines 1820 and 1920 in Figures 18a and 19a and from the discussions of these figures. '935 patent, 18:50-51; 19:29-32.

Second, the examples also allow the "real world" parabolic curvature to deviate from a "mathematical" parabolic shape by up to 0.5mm, regardless of the plate's size or the curvature's size. *Id*., 19:9-26. Other parameters in the examples bound the parabolic curvature's size or location but do not address parabolic shape and therefore should not be considered bounds on whether the "real-world" curvature is or is not "parabolic."

Third, the '935 patent specification requires that the parabolic curvature induced by the frame assembly be concave in order to avoid the convexity in the plate that could interfere with the infrared light field above the plate. *Id*., 1:56-2:4; 5:60-6:2; 6:7-11; 6:14-18; 8:13-30; 16:28-35; 16:36-42. The specification does not use the term "convex" in its ordinarily understood context of a shape of the touch surface. Instead, "convex" refers to the distance above the touch plate's edge plane that the touch surface might extend and interfere with the light. *Id*., 19:9-26; Fig. 11(d) ("convex" referring to distance "b" while "concave" referring to distance "c"). Similarly, the

specification uses the term "concave" to refer to the curvature's distance away from the light, or toward the display panel. *See id*., 8:24-26 ("[T]he plate 2 is given a slightly concave shape, i.e. in the direction from the touch surface of the plate 2 toward the panel 1"); 9:45-54; 10:54-58; 19:9-26; Fig. 11(d). The term "parabolic" curvature does not encompass conformance with a convex curvature since the patent expressly directs that the purported invention avoids curvature in that direction. *See supra*, pp. 1-2 (stating "FlatFrog's InGlass outperforms competing technologies based on FlatFrog's discovery, in 2015, that using a concave touch surface affords unexpected benefits and allows the infrared light to closely skim the surface of the glass…."); *supra*, p. 7 (stating "the key is to avoid convexity in the plate…."). The overall curvature and its conformance to a mathematical parabola must remain concave, i.e., bowing toward the display panel, and can only include an amount of convexity so limited that it does not interfere with the light field. *See id*. As a result, Defendants' proposed construction that the parabolic curvature conform to a curvature that bows toward the display panel is correct. *See* '935 Patent, at 8:24-26.

Plaintiff's back-up position, that the term should be construed as "substantially parabolic," also should fail. The addition of the imprecise broadening term "substantially," when patentee did not elect to use that term when originally drafting the claim term, is improper. *See Biovail Labs. Int'l SRL v. Abrika LLP*, 2006 WL 6111777, at *16-18 (S.D. Fla. Aug. 24, 2006) (rejecting patentee's proposed inclusion of the modifier "substantially" in construction of "water-insoluble polymer," finding that the addition of "substantially" was "subjective" and "imprecise"); *Eko Brands, LLC v. Adrian Rivera Maynez Enters., Inc.*, 2020 U.S. Dist. LEXIS 47170, at *9-*12 (C.D. Cal. Mar. 16, 2020) (rejecting patentee's attempt to construe the term "planar" as "substantially flat" and noting that such an interpretation "would expand the plain meaning of 'planar' itself").

c. FlatFrog's Reply Position

FlatFrog discovered that if the curvature of the touch surface can be made parabolic – meaning it resembles a parabola – that certain additional performance benefits can be achieved. *See, e.g.*, '935 patent, 16:4-62. The specification describes the scientific theory behind this discovery and provides mathematical models of a parabola. *Id.* at 16:63-21:12.

However, the patent also explains that in the real world, nothing is perfect. Touch plates cannot be perfectly manufactured, positioned, or held in shape, and real-world touch plates will not have a perfect mathematical parabolic shape. *Id.* at 18:45-49. The patent then provides "a preferred set of restrictions on the shape of the touch surface in order to achieve an optimal touch surface shape" that includes a 0.5mm deviation from a mathematical parabola. *Id.* at 19:9-24. Despite providing these parameters for an optimal parabolic curvature, the specification nowhere defines "parabolic" as being limited to a 0.5mm deviation from a mathematical parabola. Nor do the claims recite this numerical value. *See, e.g.*, *Conoco, Inc. v. Energy & Env't Int'l*, 460 F.3d 1349, 1357-58 (Fed. Cir. 2006) ("[W]hen a claim term is expressed in general descriptive words, we will not ordinarily limit the term to a numerical range that may appear in the written description or in other claims.").

Promethean's construction imports a numerical limitation ("does not vary from the mathematical parabola by more than 0.5mm") from the specification and should be rejected. It is not in the claims. And the curvature shown in Figure 18a deviates by more than 0.5mm. Figure 18b plots the deviation of the curvature depicted in Figure 18a from a mathematical parabola in a graph and, as shown below, the curvature deviates by more than 0.5mm along the right edge of the display:

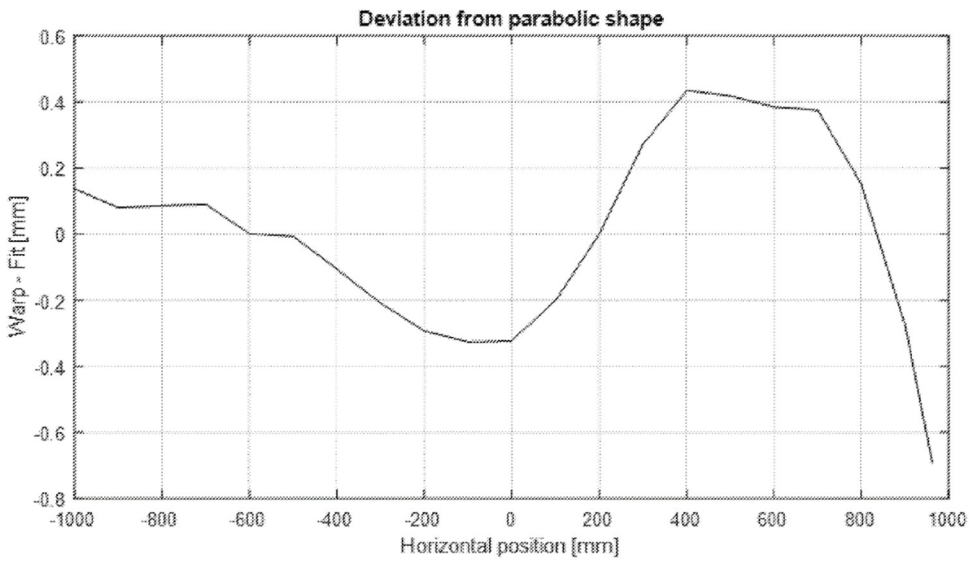


Figure 18b

Adopting Promethean's proposed construction would also improperly exclude a preferred embodiment without any evidence that this was intended. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (a claim construction that excludes the preferred embodiment is "rarely, if ever, correct and would require highly persuasive evidentiary support"). Rather, FlatFrog's claims, cover a touch surface having a real-world parabolic curvature, which may deviate from a mathematical parabola but is still recognizable as parabolic.

Promethean's bootstrapped proposal also imports a "concave" term into the claims and then construes that term to require the *post*-integrated touch surface "bow in towards the display." It is improper to narrow the claims in this way. The claims do not limit the *post*-integration curvature of the touch screen to "concave." By contrast, claim 7 limits the inherent curvature to "concave" *before* integration with a frame assembly. But the claims nowhere require the touch surface *after* integration to be "concave." Nor does the specification exclude post-integration curvatures having some convexity (i.e., bow away from the display). The table defining a "preferred set of restrictions" to achieve "an optimal touch surface shape" after integrating the touch screen into a frame assembly expressly permits some degree of convexity and even provides

a "max convexity." '935 patent, 19:6-24. The concept of "maximum allowed convexity" is also depicted in Figure 11d and its accompanying description. *Id.* at 16:28-35; Fig. 11d. These portions of the specification refute Promethean's construction.

Promethean professes that a real world "parabola" may have "little, if any, shape similarity to an actual parabola." This concern is unfounded. Figures 18a, 19a, 20b-20d, and 21b-21d depict real-world curves the specification describes as "parabolic" and each resembles a parabola. A construction of "parabolic" is unwarranted. But, to address Promethean's concern, FlatFrog proposed a construction of "parabolic" to mean "substantially parabolic" to require that the claimed "parabolic" curvature be substantially similar in shape to a mathematical parabola. *See, e.g.*, *Playtex Prods., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 906-09 (Fed. Cir. 2005) ("The term 'substantial' is a meaningful modifier implying 'approximate,' rather than 'perfect.'").

Promethean's reliance on *Iridescent* and *Irdeto* is misplaced because each involved coined terms without an accepted meaning. *Iridescent*, 933 F.3d at 1350-53 ("high quality of service connection"); *Irdeto*, 383 F.3d at 1300 ("group key"). Here, by contrast, "parabolic" has a well-understood definition, is clarified with mathematical equations in the specification, and each of the depicted parabolic curvatures in exemplary real-world devices resembles a parabola.

Nor do *Biovail* or *Eko* preclude using "substantially" to characterize a real-world parabolic curvature in a manufactured plate as opposed to a mathematical parabola in the '935 patent. In *Biovail*, the construed term was binary (soluble vs. insoluble) and the intrinsic record "employ[ed] descriptive terms with well-known quantitative meanings." 2006 WL 6111777, at *18. In *Eko*, in which "planar" was construed as flat rather than substantially flat, the patentee added "planar" to the claims to distinguish the prior art; the patentee did not dispute the examiner's express construction of "planar" as "flat," and all of the embodiments in the specification were flat. 2020

U.S. Dist. LEXIS 47170, at *10-12. But here, the '935 patent expressly refers to "deviation" between a real-world parabolic shape and a mathematical parabola. '935 patent, at 18:45-49.

d. Promethean's Sur-Reply Position

Plaintiff asserts that examples depicted in Figures 18, 19, 20, and 21 "resemble" a mathematical parabola. Regardless of those figures, however, the 100% or more deviation from a parabola that the '935 patent's example table permits means the '935 patent's use of "parabolic" encompasses curvatures that have no possible resemblance to a parabola. Moreover, Plaintiff's proposal that a "parabolic" curvature is one that "resembles" a mathematical parabola fails because the purely subjective criteria of resemblance would not be tempered by any objective qualifications. *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249, 1251-53 & n.3 (Fed. Cir. 2008) (rejecting patentee's arguments that specification provided objective boundaries for claim term).

Plaintiff criticizes Defendants' reliance on the *Iridescent* and *Irdeto* cases on grounds that they involved coined terms without accepted meanings. However, as set forth above and in the answering brief, the POSA would not recognize an ordinary meaning of a "parabolic" curvature as used in the '935 patent because the patent's use of the term encompasses curvatures that are beyond any lay understanding of a parabola. Moreover, Plaintiff has presented no evidence, nor are Defendants aware of any, that there is any common understanding of a "parabolic" curvature in the art of touch sensitive panels. *See* Decl. at ¶ 36 (JEX-05). In these circumstances, the '935 patent uses "parabolic" curvature as a coined term. *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1361-62 (Fed. Cir. 2013) (claim term limited to specification disclosure where unrebutted expert testimony indicated term was not a term of art and where term would not have had plain and ordinary meaning to POSA).

Without ordinary meaning, "parabolic" curvature must find its bounds within the specification. The three bounds the '935 patent provides are that the parabolic curvature must (1) conform to a best fit mathematical parabola, (2) not deviate from the mathematical parabola by more than 0.5mm, and (3) be concave, which in the context of the '935 patent means that the best fit mathematical parabola bows toward the display panel. Plaintiff has raised no express objection to the first boundary. Plaintiff opposes the 0.5mm boundary because, Plaintiff argues, the '935 patent's Figure 18b shows data at the graph's extreme end that exceeds it. However, the specification expressly states that the Figure 18b example *meets* the requirement that "parabolic deviation [is less than] 0.5mm." '935 patent, 18:63-67. Thus, the POSA would understand the apparent anomaly at the tail of the Figure 18b graph to be extraneous data. Alternatively, if the Court accepts Plaintiff's apparent position that the '935 patent presents internally inconsistent example data, the Court should find the term to be indefinite. *See IQASR LLC v. Wendt Corp.*, 825 Fed. Appx. 900, 905-06 (Fed Cir. 2020) (finding "contradicting examples in the specification introduce ambiguity to an otherwise clear term and render it indefinite").

Plaintiff argues the specification does not impose the third boundary, concavity, to the plate when in the frame because claim 7 expressly applies that limitation to the plate when out of the frame and because the specification expressly allows for "convexity." The first objection fails because a claim language convention cannot undermine a term's meaning as established by the specification. The second objection fails because the specification's references to convexity do not contradict Defendants' proposed construction. The specification establishes that the plate's overall curvature must conform to a parabola and that that conforming parabolic curvature must bow toward the display, regardless whether any specific portion of the plate surface might define some degree of convexity. For example, the specification explains, at 16:36-42, that a minimum

concave depth parameter ("a" in Figure 11d) is needed to assure that the individual convex portions of the curvature do not accumulate such that the *overall* curvature, i.e. the parabola to which the real-world curvature conforms (*see* boundary (1) above), is not convex.

5. "a parabolic curvature in the touch surface relative to a first axis and relative to a second axis perpendicular to the first axis" (claim 1) / "a second curvature along the width and along the length in the touch surface" (claim 7 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
No construction needed.	The parabolic curvature is defined in the touch surface relative at least to a first axis and to a second axis perpendicular to the first axis. Curvature of the parabolic curvature at the first axis may be different from curvature of the parabolic curvature at the second axis. The second curvature is defined along at least the width in the touch surface and the length in the touch surface perpendicular to the width. Curvature of the second curvature along the width may be different from curvature of the second curvature along the length.

a. FlatFrog's Opening Position

Promethean contends that this phrase must be construed, but FlatFrog disagrees. While FlatFrog generally agrees with Promethean's view of the scope of this term, FlatFrog does not see a need to inject additional language into the claims when the claims are straightforward and do not imply that the curvature in one axis must be the same as the curvature in a different axis. After Promethean has articulated its argument and reasoning for its position, FlatFrog will respond in its reply brief.

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b. Promethean's Answering Position

The parties dispute whether the claims (1) require the curvature to exist in both claimed dimensions, and (2) allow the curvature to be different in both claimed dimensions.

First, regarding existence of the parabolic curvature in two dimensions or one, the language of claim 1 specifically provides that the parabolic curvature must exist in two dimensions:

> parabolic curvature in the touch surface relative to a first axis and relative to a second axis perpendicular to the first axis.

'935 patent, claim 1. The language of claim 7 also establishes that curvature exists in two dimensions: "along the width ***and*** along the length in the touch surface." *Id.*, claim 7 (emphasis added).

Second, regarding different curvature in both claimed dimensions, the specification's embodiments in which the touch glass is curved in two dimensions disclose that the curvature in the two dimensions can be different. *See id*., 16:63-17:47.

Plaintiff states that it "generally agrees" with Defendants' proposal. Insofar as Plaintiff's "general" agreement indicates an ongoing dispute, the claims need to be construed and Defendants' proposal adopted.

c. FlatFrog's Reply Position

These terms do not need construction because the claim language is clear and there is no dispute between the parties. Claim construction is intended to resolve disputes as to claim scope, not to redraft the claim language at a defendant's election—especially where defendant's proposed construction simply adds words that may create unintended consequences and spawn more disputes down the road.

d. Promethean's Sur-Reply Position

Plaintiff agrees with Defendants' proposed construction but then opposes it as likely to "create unintended consequences and spawn disputes," without explaining how. With no articulated basis of opposition, the Court should accept the parties' agreement.

6. "wherein the plate has a first curvature in the touch surface when not installed in the frame assembly, and wherein the plate has a second curvature along the width and along the length in the touch surface when the plate is installed in the frame assembly" (claim 7 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
wherein the plate is configured to have a first curvature in the touch surface when not installed in the frame assembly, and a second curvature along the width and along the length in the touch surface when the plate is installed in the frame assembly	Indefinite

a. FlatFrog's Opening Position

Claim 7 of the '935 patent recites a "touch sensing apparatus" with a display panel, a plate, emitters, detectors, and a frame assembly. '935 patent at 22:16-42. FlatFrog believes that the scope of the claim is clear when read in the context of the specification, but Promethean contends it is indefinite (*see* JEX-03 at 22-23), so FlatFrog identified this term for construction in view of the specification.

Promethean alleges this element is indefinite because infringement "may depend on the occurrence of events that may, or may not, occur in the future." *Id.* That is incorrect. This element, properly understood in view of the intrinsic evidence, does not depend on future events. Instead, this claim is directed to the claimed touch sensing apparatus which includes a plate having the recited **property or characteristic** of a "first curvature in the touch surface when not installed in the frame assembly" and "a second curvature along the width and along the length in the touch

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surface when the place plate is installed in the frame assembly." ECF No. 89 at 2 (the parties agree that "curvature" is a property of an object). This element explains this characteristic of the plate by simply giving a name to the curvature of the freestanding plate ("first curvature") and a name to the curvature of the plate when installed in the frame assembly ("second curvature"). The "first curvature" and "second curvature" are expressly called out in claim 7 because they are referenced again later in claim 7 and in dependent claims 9-11.

This is amply supported by the specification, which discloses that the plate is configured to have a first curvature when not installed in the frame assembly and a second/desired or "controlled" curvature after it is installed in the frame assembly. *See, e.g.*, '935 patent at 1:15-22, 1:56-2:17, 5:60-67, 8:1-38, 9:37-54, 13:60-14:9, 14:18-21. More specifically, the free-standing plate, before installation into a frame assembly, will necessarily have a curvature (including zero curvature for a flat plate). *See, e.g.*, ECF No. 89 at 2. The specification gives non-limiting examples of plates with varying pre-installed curvatures, such as substantially flat (*see, e.g.*, '935 patent at 5:62-67) or curved (*see, e.g.*, *id.* at 1:16-19; *id.* at 2:23-25). The specification then discloses that the frame assembly may be configured to control the curvature of any plate when the plate is installed in the frame assembly to achieve a desired curvature of the plate. *See, e.g.*, *id.* at 8:1-38, 9:37-54, 14:18-21. For example, the specification discloses embodiments with a frame assembly "configured to hold or support the plate" that "applies a controlled force to the plate [] such that curvature of the plate [] is controlled." *Id.* at 6:22-25.

Contrary to Promethean's assertions, nothing in claim 7 refers to a curvature that depends on future events. None of the intrinsic evidence cited by Promethean identifies a future event after the plate is assembled in the frame assembly (e.g., such as later removing the plate from the frame assembly). In fact, the specification makes clear that it is the curvature of the plate when installed

in the frame assembly (i.e., "after integration") that is "a concern." *Id.* at 5:63-6:2. It says nothing about later removal of the plate by the user after assembly. Rather, the focus of the patent is on the plate being configured to have an initial curvature ("a first curvature") when not installed in the frame assembly, and "a second curvature" when installed in the frame assembly. Accordingly, and in light of Promethean's indefiniteness argument, FlatFrog proposes construing this term as follows: "wherein the plate is configured to have a first curvature in the touch surface when not installed in the frame assembly, and a second curvature along the width and along the length in the touch surface when the plate is installed in the frame assembly." This construction is consistent with the intrinsic record and the claim language as explained above.

Promethean's "indefiniteness" position seeks to manufacture uncertainty and confusion where none exists. Although Promethean has argued that the claim could be read to cover an end user removing the plate from a frame assembly after purchasing the touchscreen, Promethean identifies no disclosure in the specification that refers to such disassembly or suggests this was the intended scope of claim 7. Instead, the patent is solely directed to a method of assembling, not disassembling, a touch sensing apparatus. *See, e.g.*, *id.* at 1:19-22 ("The invention also relates to a method for assembling a plate of an optical touch sensitive system with a panel (such as a display panel) in such a way that curvature is controlled."). FlatFrog's construction is thus true to the intrinsic evidence; Promethean's is not.

b. Promethean's Answering Position

Plaintiff's proposed construction differs from the literal claim language only in rewriting the word "has." Plaintiff's proposal is an overt attempt to change the clear and unambiguous word "has" to "configured to have" in order to preserve validity. Plaintiff's fundamentally flawed effort conflicts with the ordinary meaning and has no support in the specification.

Thus, the parties dispute whether (a) the Court should rewrite the otherwise unambiguous word "has" in the claim language, changing it to "configured to have," in order to preserve validity and (b) whether claim 7 is indefinite. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1327, 1328 (Fed. Cir. 2005) (declining to construe claim term to preserve validity where term is unambiguous).

The POSA, in view of the specification, would understand the ordinary meaning of the word "has" to be: to possess or to include. *Webster's* 556 (defining "have" to mean to hold, include, or contain as a part or whole). The word refers to a condition. Its meaning does not extend to how the condition comes about or when the condition exists. Absent evidence that the patentee used the term "has" such that it has no ordinarily understood meaning, or that the patentee provided an express or implied meaning, such limitations must come from other claim language.

The first "whereas" clause, under the ordinary meaning of "has," requires simply that the plate possesses a concave curvature at a moment in time (when the first plate is not installed in the frame assembly), regardless whether the concave curvature comes from an inherent condition of the plate or through applying an external force. *See* '935 patent, claim 7 (reciting "wherein the first curvature is concave"). No language in the first "whereas" clause, or elsewhere, limits the first curvature's cause. Even though the second "whereas" clause uses language requiring that the frame assembly be the cause of the touch surface's parabolic curvature, that language is separate from the word "has." That is, the word "has" has the same meaning in both "whereas" clauses and carries no meaning regarding the cause of the touch surface's curvature.

These clauses cause claim 7 to be indefinite because any given touch sensing apparatus could infringe or not infringe, simultaneously, depending on how a component of the apparatus (the plate) is handled in the future under changing conditions. *See Geneva Pharmaceuticals, Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003) (finding proposed claim

construction indefinite when result would be that a given formulation would, or would not, infringe the claims, depending on how formulation might later be used). Here, claim 7 is directed to a touch sensing apparatus comprising, *inter alia*, a display panel, a plate, and a frame assembly with an element thereof arranged around at least a portion of the periphery of the plate. The plate "has a first curvature in the touch surface when not installed in the frame assembly." Nothing in the meaning of "has," or in any other language in claim 7, restricts the cause of the first curvature to being internal (as opposed to external) to the plate or to occurring in the past (as opposed to the future). If an artisan has a touch sensing apparatus with a plate that was not concavely curved prior to its assembly into the touch sensing apparatus, such that the plate does not bring the apparatus within the scope of the claim due to its past curvature when out of the frame, the artisan cannot know if the apparatus nonetheless falls within the claim because of curvature that an unpredictable future force may apply to the plate when it is again out of the frame. As the Court noted in *Geneva Pharmaceuticals*, such a result is "the epitome of indefiniteness." *Id*. at 1384.

Thus, the indefiniteness arises from the unambiguous plain meaning of the word "has." To avoid that result, Plaintiff argues that curvature is a "property or characteristic" of an object. *Supra*, pp. 35-36. Then, to identify the property's origin, Plaintiff asserts that "the focus of the patent is on the plate being ***configured to have***" the first and second curvatures. *Supra*, p. 37. Thus, Plaintiff construes the word "has" to be "is configured to have," thereby requiring that the plate is specifically designed to have the first and second curvatures inherently, without the aid of any external force. *See Aspex Eyewear, Inc.*, 672 F.3d at 1349 (equating "configured to" perform function to being "made to" or "designed to" perform function, not merely capable of performing function). Plaintiff thus contends that the claim requires the plate to have an inherently concave

"first" curvature so that the concave curvature is a measurable property of the plate at any and all times, excluding from the claim's scope a curvature caused by an externally-applied force.

Plaintiff's proposed construction is mistaken. First, Plaintiff provides no basis for construing the word "has" to mean "is configured to have" or anything else inconsistent with the term's ordinary meaning.

Second, Plaintiff is wrong: the patent's intrinsic evidence does reference future events. For example, the '935 specification refers to disassembly, discussing a touch sensing apparatus component, i.e., second frame element 103a, 103b, in the context of its shape once the touch sensing apparatus is disassembled. '935 patent, 10:21-25. Further, as Plaintiff recognizes, the patentee knew how to impose temporal limitations when desired. *See supra*, p. 37 (noting specification's reference to "after integration," which mirrors claim 3's reference to curvature "after the plate is configured in the frame assembly"). The omission of such language from claim 7 indicates that the patentee did not intend to limit claim 7 to past events.

Third, Plaintiff's proposed construction of "has" to mean "is configured to have" applies not only to the first "whereas" clause, but also to the second. Thus, Plaintiff's construction would require the plate to be specifically designed, itself, to have a parabolic curvature when it is installed in the frame assembly. However, the specification provides no support for such a construction. The specification's only disclosure of the cause of the plate's curvature when in the frame is that the frame assembly controls curvature of a "normally substantially flat" plate. *See* '935 Patent, 5:60-6:29; 8:4-38; 8:49-56; 9:15-29. The specification has no disclosure of a touch plate that is, in and of itself, specifically designed to have a parabolic curvature when in the frame assembly. A proposed construction that both conflicts with the ordinary meaning of the claim language at issue and finds no support in the specification must fail.

Further, Plaintiff's argument that "the patent is solely directed to a method of assembling, not disassembling, a touch sensing apparatus" fails at least because this is an apparatus claim. In any event, as noted above, the specification refers to disassembly in describing the characteristics of a touch sensing apparatus component, i.e., second frame element 103a, 103b.

c. FlatFrog's Reply Position

This claim element, including the use of "has" complained about by Promethean, is not indefinite. It provides fair and sufficient notice to competitors and those of skill in the art that the claim covers a touch screen system comprising a plate that "has a first curvature"—which Promethean characterizes as an "inherent" curvature in its brief and expert declaration (*see, e.g.*, JEX-05 ¶¶ 15, 16, 29)—and also a "second curvature . . . when the plate is installed in the frame assembly." Indeed, in another section of its brief, Promethean wrote that a skilled artisan "would understand that [claim 7's] references to an initial concave curvature and a *later* parabolic curvature mean that the intervening insertion of the plate into the frame assembly" results in the plate's "parabolic curvature." *Infra* (emphasis added). The meaning of the claim is clear and not reasonably disputed, yet Promethean contended during the meet and confers that this claim element is indefinite. FlatFrog disagreed, but in response to Promethean's assertion and to provide additional clarity, FlatFrog suggested that "has" be construed as "is configured to have." This was intended to clarify that the plate has what Promethean has described in its answering brief as an "inherent" first curvature, which FlatFrog referred to as a property or characteristic of the plate in its opening brief. Under either articulation the meaning of the claim is clear and the same. Thus, Promethean has failed to carry its heavy burden to establish that this term, considering the specification, "fails to inform, with reasonable certainty, those skilled in the art . . . about the scope of the invention." *Eidos Display, LLC v. AU Optronics Corp.*, 779 F.3d 1360, 1364 (Fed. Cir.

2015). To the contrary, this term is "precise enough to afford clear notice of what is claimed." *Id.* Significantly, Promethean's expert did not contend otherwise.

Promethean nevertheless tries to create ambiguity by arguing that the first or inherent curvature refers to a *future* curvature after the plate is removed from an assembled touchscreen device. That argument, however, is inconsistent with Promethean's assertion noted above that a skilled artisan "would understand that [claim 7's] references to an initial concave curvature and a *later* parabolic curvature mean that the intervening insertion of the plate into the frame assembly" results in the plate's "parabolic curvature." *Infra* (emphasis added). Promethean's arguments on this point are also inconsistent with the specification, which provides no support for Promethean's argument that the "first curvature" refers to a future curvature after disassembly. As explained above, the specification repeatedly discloses that the plate is configured to have a first (inherent) curvature when not installed in the frame assembly and a second ("controlled") curvature after it is installed in the frame assembly. *See, e.g.*, '935 patent at 1:15-22, 1:56-2:17, 3:8-23, 5:60-67, 8:1-38, 9:37-54, 13:60-14:9, 14:18-21. Promethean identified nothing in the specification that refers to the curvature of the plate after it has been removed from the frame assembly. Although Promethean contends that "the patent's intrinsic evidence does reference future events," the passage it cites describes a disassembled frame element, not the curvature of a disassembled touch screen.

Promethean additionally contends that FlatFrog's proposed construction requires "the plate to be specifically designed, itself, to have a parabolic curvature when it is installed in the frame assembly." That is incorrect; the claim does not require that. Instead, the claim only requires what it says, that the plate have a first and second curvature pre- and post-integration into the assembly. And the specification makes it clear that the claimed second curvature is induced by integration

into the assembly. That is, the plate is *not* "designed, itself, to have a parabolic curvature" as argued by Promethean.

Promethean's reliance on *Geneva* is misplaced. Promethean admits that plate has an inherent (first) curvature before it is integrated into the frame assembly. The presence of such an inherent property/characteristic does not create a situation, as there was in *Geneva*, where a product would "simultaneously infringe and not infringe the claims." 349 F.3d at 1384. Promethean, other competitors, and those of skill in the art are on notice that the inherent curvature of the plate meets the "first curvature" element of the claim. There is thus no fair notice problem to competitors as there was in *Geneva*.

d. Promethean's Sur-Reply Position

The term under construction requires that "the plate *has* a first curvature" and that "the plate *has* a second curvature." (emphasis added) Plaintiff argues that "has" means that the claimed first curvature is an inherent curvature of the plate, i.e., without regard to external forces applied to the plate. *See supra*, p. 41. However, Plaintiff believes the same word "has" does *not* require the *second* curvature to be an inherent curvature and that the specification requires the second curvature to be *induced* by the plate's integration into the frame assembly. *Supra*, pp. 42-43.

Plaintiff mischaracterizes Defendants and its expert as agreeing with Plaintiff that the claimed first curvature is an "inherent" curvature. As set forth in Defendants' answering brief, the word "has" should not be rewritten as "is configured to have" or to require inherent curvature of either the first or second curvature. Further, nothing in claim 7, and particularly in the meaning of "has," requires the frame assembly to induce, i.e. cause the formation of, the second curvature. During prosecution, Patentee expressly required inducement in claim 1, but Plaintiff agreed to an examiner's amendment to remove the inducement limitation from the claim that

matured into claim 7. *See* JEX-14. Plaintiff has provided no justification to re-insert by claim interpretation subject matter it expressly agreed to remove during prosecution.

Plaintiff also makes a series of unavailing arguments that claim 7 requires the first curvature to occur before the second curvature, despite the lack of any supporting language in the claim or requirement from the specification. Plaintiff asserts that Defendants have identified no support in the specification for curvature after disassembly of the plate. But the '935 specification provides no disclosure of *any* curvature that would meet the claimed requirements for the first curvature. Other than referring to disavowed prior art methods, the citations on Plaintiff's reply brief, *supra* p. 42, could imply only that a plate not subject to the frame's control can be substantially flat. But claim 7 requires that the claimed first curvature be concave. The specification provides no support for that limitation and, thus, provides no support for the claimed first curvature at all, whether before or after the plate's installation in the frame assembly.

Similarly, Plaintiff's assertion that Defendants' construction *requires* that the first curvature occur in the future is false. As set forth previously, the term "has" encompasses the first curvature's occurrence before or after the second curvature but does not restrict the claim to either.

7. "wherein the plate has a second curvature along the width and along the length in the touch surface when the plate is installed in the frame assembly" (claim 7 of '935 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction (FINAL REVISED)
No construction needed. If the Court determines a construction is needed, then "has" should be construed as "is configured to have."	The touch surface of the plate, when the plate is installed in the frame assembly, has a second curvature along a width and along a length of the touch surface, wherein the plate does not have an inherent curvature greater than the second curvature.

a. FlatFrog's Opening Position

Promethean contends that this phrase must be construed, but FlatFrog disagrees. FlatFrog sees no basis to import unclaimed restrictions regarding the relationship of the "first curvature" to the "second curvature." After Promethean has articulated its argument and reasoning for its position, FlatFrog will respond in its reply brief.

b. Promethean's Answering Position

Defendants' proposal (REVISED): The touch surface of the plate, when the plate is installed in the frame assembly, has a second curvature at the same position on the touch surface as the first curvature but that is different from the first curvature, wherein the first curvature is not greater than the second curvature.

Defendants modify their proposal to replace the phrase "in the first plane and in the second plane" with "at the same position on the touch surface as." References to "the first plane" and "the second plane" were originally made to terms introduced in construction of another claim term that was not selected for construction in the present process. As the purpose of referring to the planes was to establish that the first and second curvatures are located at the same position on the touch surface, Defendants have made that clarification in this construction.

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Defendants address certain portions of this phrase in sections III.A.3.b, III.A.4.b, and III.A.5.b above. Here, Defendants address the parties' disputes whether (1) claim 7 requires the measurement of the second curvature must be made at the same position in the plate as measurement of the first curvature, (2) the first curvature and second curvature must be different from each other at the touch surface, and (3) the patent disavows coverage of the touch surface having an inherent first curvature greater than the claimed parabolic curvature of the second curvature.

Regarding the first dispute, the claim's use of "first" and "second" creates an ambiguity, in that it is unclear whether the terms refer to curvatures at the same position on the touch surface (but at different times, as required by the claim language) or, instead, can encompass curvatures at different, unrelated positions on the touch surface. However, as noted above, a significant portion of the '935 patent's specification is dedicated to discussions of modifications of glass plate curvature, meaning a curvature before and a curvature after. *See* '935 Patent, 1:64-2:4; 5:60-6:29; 8:4-38; 8:49-56; 9:15-29; 9:37-13:54; 13:60-14:9; 16:4-8. Comparisons between an initial and a later curvature make sense only if those curvatures are measured at the same position on the plate. Thus, Defendants' proposal is correct.

Regarding the second dispute, the POSA would understand from the '935 specification that the first and second curvatures are different from each other. The language of claim 7, in reciting that the first curvature is concave while the second curvature is parabolic when installed into the frame assembly, conveys to the POSA that the frame assembly causes the parabolic curvature. The specification confirms the causal relationship in its statement of "the invention" disclosed as relating to assembling the system "in such a way" that the system controls the curvature of the plate's touch surface. *See id.*, 1:19-22 (stating "[t]he invention also relates to a method for

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assembling a plate of an optical touch sensitive system with a panel (such as a display panel) in such a way that curvature is controlled"). Thus, the POSA would understand that the claim's references to an initial concave curvature and a later parabolic curvature mean that the intervening insertion of the plate into the frame assembly causes a change in the plate's curvature to the parabolic curvature. Thus, the POSA would understand the first and second curvatures are different from each other.

Regarding the third dispute, Defendants' proposal "wherein the first curvature is not greater than the second curvature" reflects the patent's disavowal of coverage of embodiments wherein, prior to the plate's assembly into the frame assembly, the plate has an inherent curvature greater than the final parabolic curvature. The basis for the disavowal in claim 7 is the same as discussed above with regard to claim 1.

Again, "has" has an ordinary meaning, and there is no basis to deviate therefrom.

c. FlatFrog's Reply Position

Promethean agrees Claim 7 refers to two curvatures of the plate: "a curvature before and a curvature after" (*supra*) installation in the frame assembly. Promethean's further proposal imports limitations into claim 7 that could easily have been added if that was FlatFrog's intent.

First, Promethean proposes a "same position" requirement even though Promethean acknowledges the claim language does not include it. The claim does not state: wherein said first curvature and said second curvature are measured at the same position on the touch surface. It would also be non-sensical to import a "same position" requirement into claim 7 because the "first curvature" includes curvature in one axis (e.g., a two-dimensional curvature profile) whereas the "second curvature" includes curvature in two axes (e.g., three dimensional curvature profile). Promethean's proposal also fails to specify whether the "first curvature" must be measured at the same position as the "width" component of the "second curvature" or the "length" component.

Furthermore, when FlatFrog intended the claims to specify a location for observing the induced curvature, they expressly did so, as in claim 9 ("along an edge of the plate"), claim 10 ("along an axis passing through a center point of the plate"), and claim 11 ("along a line passing through a point on the touch surface").

Promethean attempts to justify its "same position" requirement by stating "[c]omparisons between an initial and a later curvature make sense only if those curvatures are measured at the same position on the plate." Promethean's premise is flawed. Nowhere does claim 7 (or its dependents) *compare* the "first curvature" to the "second curvature." The only claim that compares a "first curvature" and "second curvature" is claim 3, which depends from claim 1 and not claim 7. In sum, system claim 7 never compares the inherent "first curvature" and the induced "second curvature."

Promethean baldly and incorrectly asserts a skilled artisan would understand that the "first curvature" and "second curvature" in claim 7 "are different from each other." The language of the claim only requires that the "first curvature" be concave and that the "second curvature" be parabolic. The claim does not state: wherein the first curvature differs from the second curvature.

Promethean's proposed construction also conflicts with the intrinsic record. The '935 patent seeks to control the curvature of the plate when integrating it with a frame assembly. Control includes not only changing the curvature, but also maintaining the plate's inherent curvature and solving the problem of *uncontrolled* curvature. Indeed, Promethean agrees the invention "allows the use of a glass plate *either without change in its curvature* or with a predictable change in its curvature." *Supra* (emphasis added).

Finally, Promethean recycles its "disavowal" argument, which should be rejected for the reasons stated above.

d. Promethean's Sur-Reply Position

Defendants' proposal (REVISED): The touch surface of the plate, when the plate is installed in the frame assembly, has a second curvature along a width and along a length of the touch surface, wherein the plate does not have an inherent curvature greater than the second curvature.

Defendants agree that claim 7 does not require that the first and second curvatures must occur at the same position or that the first and second curvatures be different. Defendants' construction is also amended to make clear that the disavowals in claims 1 and 7 are the same.

B. U.S. Patent No. 10,739,916

1. FlatFrog's Overview of the '916 ("sealing window") patent

The '916 patent is directed to "above surface optical touch systems" similar to the touchscreen display described in the '935 patent. '916 patent (JEX-02) at 1:16-29. The touchscreen display operates by propagating light above the touch panel and detecting the attenuation of the light when an object (e.g., a pen or a finger) blocks the propagation of the light. *Id.* at 1:25-36. The '916 patent further relates to "optical and mechanical solutions for defining the light paths" and an assembly of such touchscreen display. *Id.* at 1:16-21. The '916 patent concerns components for incorporating optical touch sensing technology with a large display.

Conventional touch systems included multiple components involved in the light propagation and detection process and, for these systems, the "cumbersome alignment between the components" made "assembly more difficult and costly." *Id.* at 1:62-64. For example, the prior art relied on "multiple components in the light scattering process" and any misalignment between these components resulted in signal loss. *Id.* at 1:64-67. And because controlling the curvature of the touch surface is critical, "previous solutions incorporate complex solutions that may not allow to fully optimize glass warpage control in a mass production line without limiting the throughput of the production." *Id.* at 1:67-2:8. In addition to greater expense, the prior art also

resulted in a "less compact system" (*id.* at 2:9-22), whereas FlatFrog sought to minimize the width of the bezel around the perimeter of the touch surface (*see, e.g.*, *id.* at 5:66-67, 7:52-8:2, and 9:10-16). The patent therefore discloses a novel configuration providing improved operation, simplified assembly, reduction in the number of components, and a reduction in the size of the bezel.

In one embodiment, consistent with the claims of the '916 patent, a touchscreen display comprises a panel that defines a touch surface and a plurality of light emitters and detectors arranged along a perimeter of the panel. *See, e.g.*, *id.*, claim 1.[3] The patent explains that the plurality of light emitters and detectors can be arranged above the touch surface to achieve a compact size and improve touch sensing operation with a direct light path between the emitters and detectors. *See, e.g.*, *id.* at 7:52-8:20, Fig. 2.

[3] The claims of the '935 patent refer to the glass defining the touch surface as a "plate" and the glass defining the "display panel" as a "panel." *See, e.g.*, '935 patent at 21:40-42. By contrast, the claims of the '916 patent use the term "panel" to refer to the glass defining the touch surface (*see, e.g.*, '916 patent, 22:21). As is common in this field, "panel" and "plate" are often used synonymously to refer to a piece of glass unless suggested otherwise by their context.

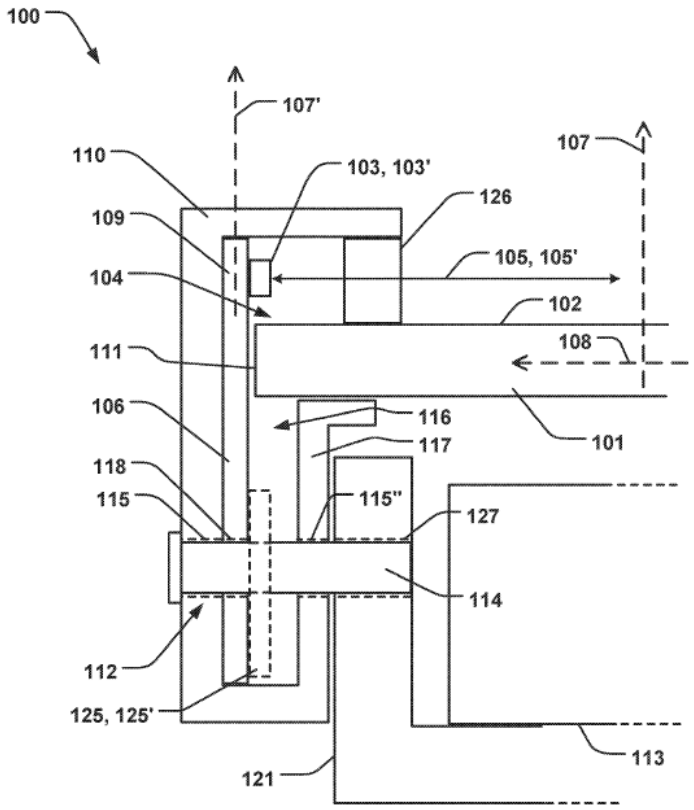


FIG. 2

The touchscreen display includes a support structure (e.g., carrier 110 in Fig. 2) and a sealing window (e.g., 126). *Id.* The sealing window has dual purposes. First, it fills the space between the panel (e.g., 101) and the support structure (e.g., 110) to shield and protect (i.e., seal) the emitters and detectors. *Id.* at 16:27-30. The sealing window "prevents ingress of dirt, water and other contaminants into the interior of the touch sensing apparatus" and therefore protects the emitters and detectors. *Id.* at 16:30-34. Second, the sealing window allows light from the emitters to pass through (i.e., like a window). *Id.* at 16:34-36. The sealing window is either (a) optically passive or (b) includes optical elements for "refracting, deflecting, diverting or focusing the light beams." *Id.* at 16:34-43. The sealing window may be formed from a single piece of material, "thus providing for a robust sealing window 126 and a stable attachment to the carrier 110 and the

light transmissive panel 101." *Id.* at 15:30-34. To further minimize the number of components and reduce manufacturing tolerances, the emitters and detectors are either "mounted directly to" the support structure (e.g., carrier 110) or mounted on an electronics board (e.g., substrate 106) which may be "directly join[ed]" to the support structure. *Id.* at 8:60-9:16. Directly joining the electronics board (e.g., substrate 106) to the support structure (e.g., carrier 110) also allows "for having the carrier 110 wired as an electrical ground reference layer of the substrate 106." *Id.* at 9:17-19.

2. "said first portion including a first projection extending downwards from said first portion and a second projection extending downwards from said first portion" (claim 1 of '916 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction (REVISED)
No construction needed	said first portion including a first structure that juts out downward from and is discrete from the first portion and a second structure that juts out downward from and is discrete from the first portion

a. FlatFrog's Opening Position

Promethean contends this term must be construed. FlatFrog disagrees and sees no basis to import unclaimed restrictions concerning the projection's discreteness or to replace "downwards" with "juts out." After Promethean has articulated its argument and reasoning for its position, FlatFrog will respond in its reply brief.

b. Promethean's Answering Position

Defendants' proposal (REVISED): said first portion including a first structure that juts out downward from and is discrete from the first portion and a second structure that juts out downward from and is discrete from the first portion.

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In its brief, Plaintiff states that Defendants' proposed construction replaces "downwards" with "juts out." Defendants' omission of the concept of "downwards" from its proposed construction was inadvertent and has been corrected above.

The parties dispute whether a recess into a structure can define "projections" that extend "from" the structure. Plaintiff's construction would encompass such a structure. Defendants' would not.

In response to Defendants' Interrogatory 7, requesting identification of the basis in the earliest application to which Plaintiff makes a priority claim for the '916 patent for each element of the asserted claim, Plaintiff identified a drawing in Swedish application No. 1730085-6 that corresponds to Figure 5A in the '916 patent and the following text:

> The sealing window 126 may comprise a fixing element 139 configured to interlock to carrier 110. In the example in Fig. 5a, the fixing element comprises a protrusion 139 arranged to interlock with a corresponding recess in the carrier 110.

JEX-07, p. 14, lines 30-38; *see* JEX-08, at Ex. A, p. 2 (Plaintiff's Answers to Defendants' First Set of Interrogatories). The Swedish application does not disclose the configuration of the recess in carrier 110, including any sides thereof. In Figure 5A, there are no "projections" extending downward from the upper portion of carrier 110. Thus, Plaintiff's position must be that unillustrated, otherwise undisclosed sides of a recess in the bottom surface of the upper portion of support structure 110 comprise "projections" that extend downwards "from" the claimed first portion.

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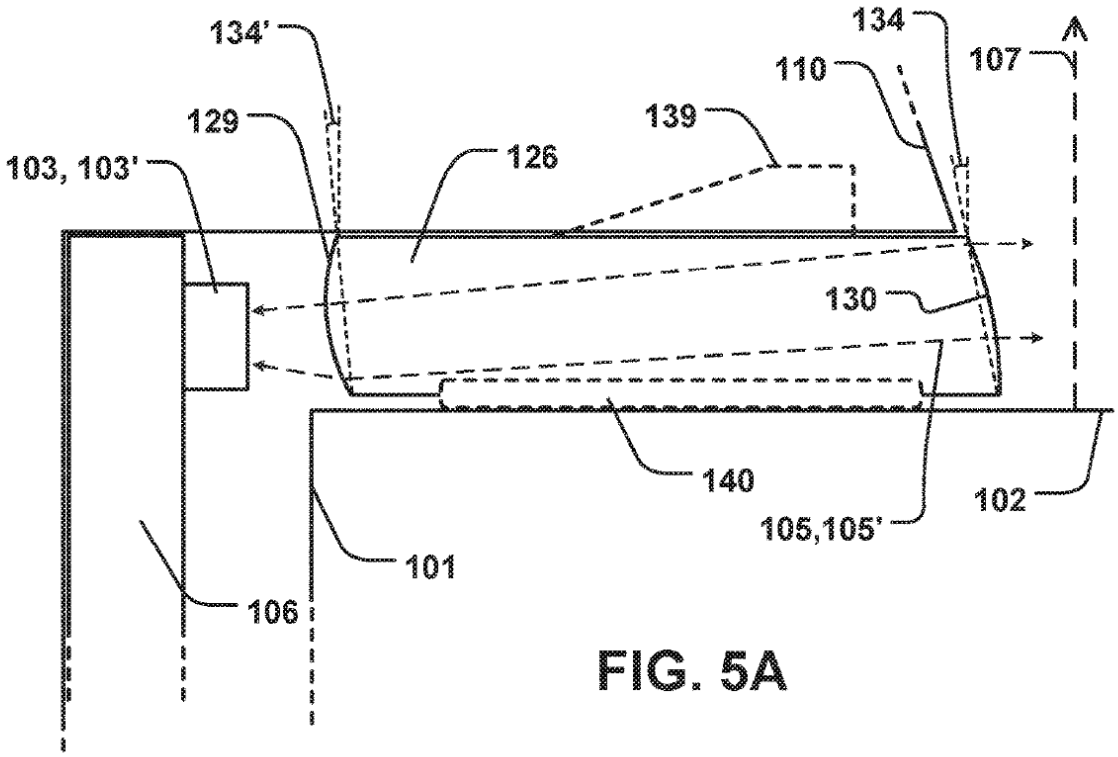


FIG. 5A

Defendants disagree and assert that a recess into a structure does not define projections extending from that structure. Defendants' proposal fits the ordinarily understood meaning of the phrase. Considering the specification of the patent, the POSA would understand the meaning of "projection" to be: a jutting out. *See Webster's* 940 (defining "projection" as: a jutting out; a part that juts out; and "project" as: to jut out, protrude). A structure that "projects" from another structure is discrete from the other structure, even if the two are connected. In that regard, the specification repeatedly distinguishes "projections" or "protrusions" from the holes or recesses into which they are received. *See* '916 patent, 5:16-33; 9:51-54; 14:59-62; 18:13-31; 18:59-63; 19:19-29; 19:46-67; 20:29-35; 20:50-53 (JEX-02). Such a relationship is impossible unless the "projection" is discrete from the structure from which it projects. This reflects that "projections," as used in the specification, must be discrete from recesses and holes so that the projections can

be received therein. *See also id.*, 10:41-45 (using disjunctive "or" to distinguish recesses from projections).

c. FlatFrog's Reply Position

Because this claim element is clearly and concisely articulated, particularly in view of Figure 9 and the specification, no construction is needed. The '916 patent concerns components for incorporating optical touch sensing technology with a large display. Figure 9, annotated below, depicts a touch sensing apparatus (100) comprising a carrier (110), with a gap (820), and a panel (101). '916 patent, 17:44-18:13. Sealing window (126) is fitted between the carrier and the panel. *Id.*

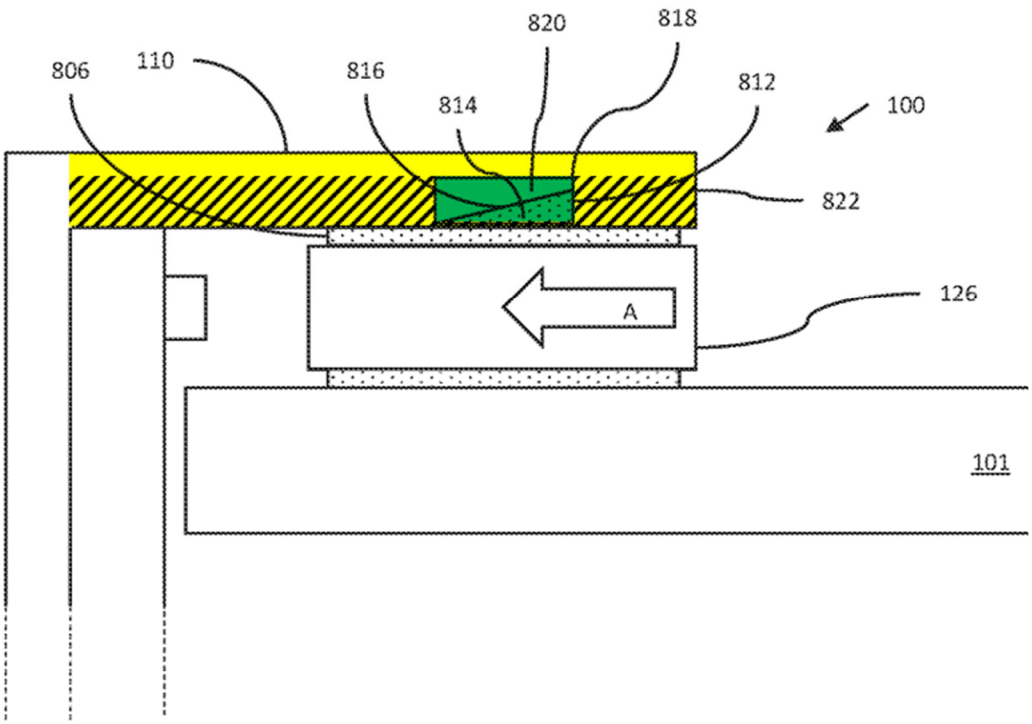


FIG. 9

Claim 1 recites a "support structure" (e.g., carrier 110) "comprising a first portion that is parallel to the touch surface." The "first portion" is annotated yellow above. The "first portion includ[es] a first projection extending downwards from said first portion and a second projection extending downwards from said first portion." The projections are annotated above in hatch marks. A "gap" between the projections forms a "receptacle," and is annotated green above. The scope of the disputed term is clear and no construction is warranted.

Promethean proposes injecting a discreteness requirement into the claim to address "whether a recess into a structure can define 'projections' that extend 'from' the structure." But whether a recess defines the projections or the projections define the recess is a distinction without a difference. Claim 1 provides the relationship between the projections and the recess/gap – the recess is between the two projections.

Promethean's reliance on Figure 5A is misplaced. Sealing window 126 may comprise a fixing element 139 (depicted as a dotted line) configured to interlock with carrier 110. "[T]he fixing element comprises a protrusion 139 arranged to interlock with a *corresponding recess* in the carrier 110." '916 patent, 14:58-66 (emphasis added). Thus, the dotted line 139 illustrates *both* a protrusion from the sealing window and a corresponding recess (or gap) within carrier 110. *Id.* Moreover, Figure 5A's gap is akin to gap (820) in Figure 9 above. Both gaps are formed between two downward projections. Figure 5A has been annotated below using a similar annotation style as Figure 9 above:

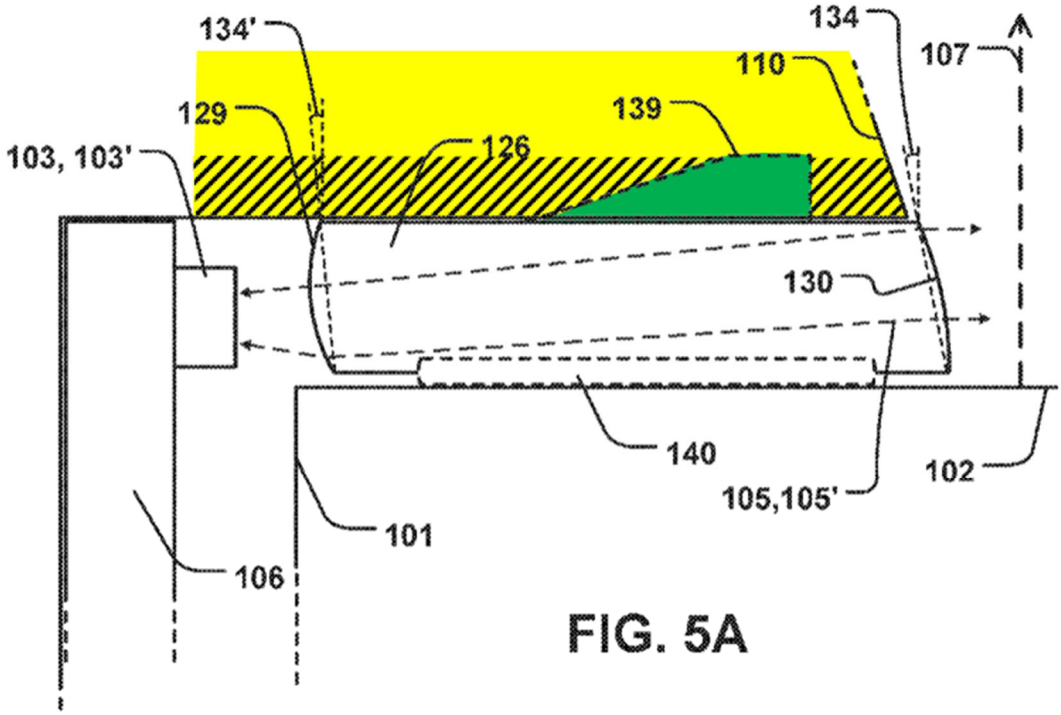


FIG. 5A

Promethean professes that a "structure that 'projects' from another structure is discrete from the other structure, even if the two are connected." This contradicts the plain language of the claim, which recites that the "first portion" of the support structure "include[es]" two projections: a first and a second. The claim does not describe these as discrete structures *connected to* the "first portion [of the support structure]" but rather as *part of the same structure*.

d. Promethean's Sur-Reply Position

Plaintiff presumes, at p. 56, *supra*, that Defendants' distinction between a recess in a surface and two projections extending from a surface "is a distinction without a difference." Plaintiff is wrong because there is a difference between structures that are distinct from each other and structures that blend continuously together, as around a recess.

In that regard, Plaintiff's assertion that Figure 5A "is akin" to Figure 9 is wrong. Figure 9 is a cross section taken through the first portion, passing through notch 820. The opposing sides

of the frame on the left and right sides of notch, or "groove," 820 in Figure 9 do not surround the notch. '916 patent, 17:66-18:2. By contrast, Figure 5A shows protrusion 139 in dashed line, indicating that whatever the receiving recess's shape might be, the carrier structure encloses the recess on all sides. The Figure 5A recess is an enclosed indention in the carrier's underside. The sides of the Figure 5A recess would not be considered "projections" *from* the carrier.

3. "optical element" (claim 1 of '916 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
sealing window including one or more elements that refracts, deflects, diverts, or focuses light beams	In a component of the touch sensing apparatus, a surface that refracts, deflects, diverts, or focuses light beams passing through the surface

a. FlatFrog's Opening Position

The parties agree that the Court should construe this disputed term, and that construction of this term requires "refracts, deflects, diverts, or focuses light beams." The parties primarily dispute whether (1) the claimed "optical element" refers to a sealing window, and (2) the claimed "optical element" is limited to a two-dimensional surface. Each should be resolved in FlatFrog's favor because FlatFrog's proposed construction of "optical element" as "sealing window including one or more elements that refracts, deflects, diverts or focuses light beams" is fully supported by the specification.

Other than the claims, the specification contains only two references to an "optical element" and both describe a single embodiment of the sealing window. '916 patent at 16:24-43. Here, the specification explains that the sealing window has two purposes. The first is to seal the plurality of emitters from contaminants from the touch surface. *Id.* at 16:27-34. The second is to allow "light from the emitters and detectors [] to propagate" through the sealing window. *Id.* at 16:34-36. With regard to this second purpose, the patent explains "the sealing window can

optionally comprise optical elements for refracting, deflecting, diverting[,] or focusing the light beams therethrough." *Id.* at 16:36-40. Alternatively, the sealing window may be optically passive and not include any "optical elements." *Id.* at 16:40-43. Thus, consistent with FlatFrog's proposed construction, the specification describes an "optical element" as one or more elements within a sealing window that refracts, deflects, diverts, or focuses light beams.

Turning to the claims of the '916 patent, they further recite that the claimed "optical element" is "configured to seal the plurality of light emitters from contaminants from the touch surface." *Id.* at 22:33-35. This is the primary purpose of the sealing window. *Id.* at 16:27-34. Thus, when the claims recite that the optical element is to be "configured to seal the plurality of light emitters from contaminants from the touch surface" (*id.* at 22:33-35), the claims are directed to those embodiments of the sealing window that include one or more optical elements (*see id.* at 16:36-40). In context, the claimed "optical element" refers to a sealing window including an optical element. This is consistent with the claim's further requirement that the "optical element" have a "mating portion" to fit into a gap in the support structure. *Id.* at 22:35-39. The specification describes embodiments of the sealing window designed to fit within a reciprocal gap in the support structure. *See, e.g.*, *id.* at 17:44-18:52. And because the specification describes embodiments of the "sealing window" that are "formed from a single monolithic piece of material" (*id.* at 15:30-34) it is entirely consistent to construe "optical element" as synonymous with "sealing window including an optical element" because a single-piece sealing window may also comprise the optical element. Construing "optical element" as "sealing window including one or more elements that refracts, deflects, diverts, or focuses light beams" is both consistent with the specification and claims, and will clarify the scope of this term for the jury.

Promethean's proposed construction of this term is generally consistent with FlatFrog's construction. The key difference between the parties' constructions is that Promethean is limiting the "optical element" to be a two-dimensional "surface," not a three-dimensional object such as a sealing window. Promethean's construction has other flaws.

As an initial matter, Promethean's proposed construction does not provide any clarity. Although it introduces a vague new element ("a component"), it does not explain what the "component" is or how it relates to the other recited elements. Furthermore, Promethean's proposal to limit the "optical element" to a two-dimensional "surface" is inconsistent with the use of the term "optical element" in the '916 patent. For example, claim 1 recites that the "optical element comprises a mating portion" having a "cross-section shape" and "engaged with the receptacle" of the support structure. *Id.* at 22:35-39. It is unclear how a "surface," i.e., a two-dimensional face of an object, can have a cross-sectional width and shape to engage with the claimed "support structure." Also, claim 5 of the '916 patent recites that "the optical element comprises a *first surface* . . . and a *second surface* opposite the first surface." *Id.* 22:54-61. Promethean's construction of "optical element" to be a "surface" creates tension with claim 5, because a single surface cannot have other surfaces.

Thus, FlatFrog's proposed construction of "optical element" as "sealing window including one or more elements that refracts, deflects, diverts or focuses light beams" is fully supported by the intrinsic record and consistent with the use of the term in the specification.

b. Promethean's Answering Position

The parties dispute whether "optical element" refers to (1) a sealing window, and (2) the entire structure through which light passes or only the surface that manipulates a light beam.

The ordinary meaning of "optical element" is "a part of an optical instrument which acts upon the light passing through the instrument such as a lens, prism, or mirror." *McGraw-Hill*

1483. An "optical instrument" is "[a]n optical system which acts on light in some desired way, such as to form a real or virtual image, to form an optical spectrum, or to produce light with a specified polarization or wavelength." *Id.*

The specification uses the term "optical element" in a way that is not consistent with its ordinary meaning because, while the specification's sealing window 126 would otherwise fall within that ordinarily understood meaning, the '916 specification distinguishes sealing window 126 from "optical elements":

> In some embodiments, as discussed in reference to FIG. 5a, **the sealing window can optionally comprise optical elements** for refracting, deflecting, diverting or focusing the light beams therethrough. However in other embodiments, the sealing window is optically passive and does not comprise any optical elements.

'916 patent, 16:36-40 (emphasis added). This passage and its emphasis that the optical elements are optional clarifies that sealing window 126 is not, in and of itself, an "optical element." *See Perfect Surgical Techniques, Inc. v. Olympus America, Inc.*, 841 F.3d 1004, 1012-13 (Fed. Cir. 2016) (finding specification's statement that device "may be perforated or otherwise provided with passages" indicated that, as used in patent, "perforated" was not the same as "passages" even though extrinsic evidence indicated ordinary meaning of "perforated" included "passages").

Because the specification uses the term in a manner that conflicts with its ordinary meaning, the specification's specific use of "optical element" informs the proper construction. *See id.*; *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1197-98 (Fed. Cir. 2013) (specification's statements that "[c]ell lines grown as a monolayer or on beads, as opposed to cells grown in three-dimensions" made clear patentee's intent that cells grown on beads are different and distinct from cells grown in three dimensions). Here, the disclosure identifies collimating surfaces 129, 130 on sealing window 126 as the optical elements, in that these surfaces perform the functions (refracting, deflecting, diverting, or focusing light beams passing therethrough) the '916

specification assigns to the optical element. '916 patent, 16:37-40; *see* 13:24-39; 13:50-54; 13:57-14:13; 14:29-57 (identifying structure on sealing window 126 that focuses light, i.e. collimating surfaces 129 and 130). The specification does not provide a general definition, express or implied, of other structures that might perform those functions. Accordingly, Defendants' construction is correct.

In contrast, Plaintiff's attempt to construe "optical element" as a "sealing window" that "[includes] one or more elements" is an effort to rename the term and thereby avoid the term's meaning as the specification defines it. Rewriting "optical element" as a "sealing window including one or more elements" merely invites the need to construe "sealing window." *See Advanced Fiber Technologies (ATF) Trust v. J &L Fiber Services, Inc.*, 674 F.3d 1365, 1373-74 (Fed. Cir. 2012) (explaining that courts may need to construe words within claim constructions).

Moreover, Plaintiff mischaracterizes the specification. Plaintiff argues that "optical element" is "synonymous with 'sealing window including an optical element' because a single-piece sealing window may also comprise the optical element." *Supra*, p. 59. However, the specification does not state that the sealing window comprises an "optical element," which Plaintiff argues could equate the entirety of the sealing window with the optical element. Instead, it states that the sealing window comprises "optical element***s***." '916 patent, 16:36-40 (emphasis added). Thus, the specification clarifies that an "optical element" is a subcomponent of the sealing window that cannot equate with the whole of the sealing window.

Plaintiff complains about including the term "component" in Defendants' proposal. Because, as properly construed, an "optical element" is a two-dimensional surface, and consistent with the term's use in the '916 specification, the "optical element" is a surface on a three dimensional object, or component.

Finally, Plaintiff discounts Defendants' proposal as leading to the claim's invalidity for indefiniteness. Claim construction cannot rewrite a claim to preserve validity where, as here, the term can be construed using ordinary claim construction tools. *See Phillips*, 415 F.3d at 1327-1328 (declining to construe claim term to preserve validity where term is unambiguous).

c. FlatFrog's Reply Position

Promethean agrees that sealing window 126 falls within the ordinary meaning of "optical element." Yet, Promethean contends a passage from the specification is inconsistent with this because the specification "clarifies that sealing window 126 is not, in and of itself, an 'optical element.'" *Supra*. Promethean's argument fails to withstand scrutiny. Promethean's purported "ordinary meaning" of an "optical element" requires it "act[] upon the light passing through the [optical] instrument." The cited passage from the specification states that "sealing window 126" can either be optically passive (e.g., no optical elements) or it can act upon the light passing through it (e.g., it may have one or more optical elements). '916 patent, 16:34-43. A sealing window with one or more optical elements is, itself, an optical element because it "acts upon the light passing through the instrument." A sealing window containing optical elements will refract, deflect, divert, or focus light beams. Thus, this sealing window is consistent with Promethean's definition of "optical element."

The claim language also supports FlatFrog's construction that "optical element" refers to a three-dimensional structure (i.e., a sealing window) rather than a two-dimensional structure (i.e., a surface). Claim 1 recites that the "optical element" comprises "a mating portion having a second *cross-section shape* that is substantially reciprocal" to the shape of the receptacle formed in the gap between the two projections of the support structure that runs parallel to the touch panel. It would be nonsensical to refer to a cross-section shape of a two-dimensional surface.

Returning to Figure 9, the gap between the first projection and the second projection that has the claimed "first cross-sectional shape" is shaded in green above. Claim 1 recites that the optical element has a "second cross-section shape" "substantially reciprocal" to the first cross-sectional shape of the receptacle. According to Promethean, only the left and right surfaces of sealing window 126 (depicted as surfaces 129 and 130 in Figure 5A) correspond to the "optical element." But considering the specification, sealing window 126 (not the left- and right-most surfaces of it) has this cross-sectional shape and engages with the support structure to serve the sealing function.

Further, dependent claim 5 recites that the claimed "optical element" comprises *two* surfaces – "a first surface facing the plurality of light emitters" and "a second surface opposite the first surface." The claimed "optical element" is not a "two-dimensional surface" as Promethean contends, but rather a three-dimensional object with multiple surfaces.

d. Promethean's Sur-Reply Position

Plaintiff continues to argue that because the specification states that the sealing window may include surfaces that are "optical elements," the entirety of the sealing window must be an optical element. However, this ignores that the specification expressly differentiates the sealing window as a whole from the optical elements. That the optical elements are optional subcomponents of the sealing window does not equate the sealing window to the optical elements.

The remainder of Plaintiff's arguments regarding "optical element" rely on Plaintiff's allegations that other claim language does not fit Defendants' construction. Plaintiff's position fails at least because the cited claims, which were filed after the original application, cannot redefine the original specification's express use of "optical element." *See Cave Consulting Grp., LLC v. OptumInsight, Inc.*, 725 Fed. Appx. 988, 993-95 (Fed. Cir. 2018) (finding later-filed claim

limitations ineffective to contradict originally-filed specification disclosure that otherwise established claim term meaning).

4. "fitted in the space between the panel and the first portion and configured to seal the plurality of light emitters from contaminants from the touch surface" (claim 1 of '916 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
filling the space between the panel and the first portion and configured to seal, optionally with the aid of a gasket, the plurality of light emitters from contaminants from the touch surface	disposed within all or part of the separation between the first portion and the panel so that it prevents the ingress of some, but not necessarily all, dirt, water and other contaminants into the interior of the touch sensing apparatus

a. FlatFrog's Opening Position

The parties' fundamental dispute about the construction of this term boils down to whether the sealing window being "**fitted** in the space between the panel and the first portion" means the sealing window **fills that space** (as FlatFrog contends), or only **part of that space** (as Promethean contends).

The specification demonstrates that FlatFrog's construction is correct. The specification explains that the touchscreen display comprises a support structure (e.g., carrier 110 in Fig. 2) and a sealing window (e.g., 126 in Fig. 2). '916 patent at 7:52-8:20, Fig. 2. As explained above with respect to the "optical element" term, the primary purpose of the sealing window is sealing and protecting the plurality of light emitters and detectors. *Id.* at 16:27-34. The sealing window achieves this purpose by filling "the space" between the panel (e.g., 101) and the support structure (e.g., 110) and "provides **sealing** around the perimeter 104 of the light transmissive panel 101 and **protects** the emitters and detectors 103, 103'. . ." *Id.* (emphasis added). "This means that the sealing window 126 prevents ingress of dirt, water and other contaminants into the interior of the touch sensing apparatus" and therefore protects the emitters and detectors. *Id.* at 16:30-34. Only

by sealing, i.e. filling, "the space" does the sealing window achieve this purpose. Because the patent does not foreclose the use of an optional gasket (*see, e.g.*, *id.* at 16:61-17:14), FlatFrog's proposed construction accounts for the use of an optional gasket. FlatFrog's construction is correct; Promethean's is not.

After Promethean provides its arguments and reasoning for its attempt to add limitations to this claim term, FlatFrog will respond in its reply brief.

b. Promethean's Answering Position

The parties dispute (1) the meaning of the phrase "fitted in" and, in particular, whether the claim requires that the optical element extend entirely from the "first portion" to the panel or, instead, encompasses the optical element's positioning within less than the entire separation between the panel and the first portion, and (2) whether the term "seal" requires a perfect seal.

The phrase at issue modifies the term "optical element." As discussed above, the parties dispute the construction of "optical element." The issues presented in this section do not depend on which construction of "optical element" is correct.

"Fit" does not require filling something. Defendants' construction is based upon the ordinary meaning of "fit" as the POSA would understand the term in view of the specification. "Fit" means: to insert or adjust until correctly in place. *See Webster's* 467. This ordinary meaning accommodates both extending entirely between one thing and another and extending only partly between one thing and another. The specification discloses examples of both conditions. *See* '916 patent, Figs. 2 and 3 (sealing window 126 surfaces extend entirely between touch surface and bottom of horizontal portion of bezel 110), Fig. 5A (sealing window 126 surfaces extend above mounting unit 140 to bottom of horizontal portion of bezel 110), and Figs. 8-12, 14, and 15 (sealing window 126 surfaces extend between seals 808 and 806). Even if gaskets are considered part of the sealing window, in several of these embodiments, the sealing window/gasket combination still

does not "fill" the entirety of the void between the panel surface and the support structure first portion. *See* '916 patent, Figs. 8-12, 15C, 15D.

The recitation in claim 1 that the optical element is fitted in the space and "configured to seal" does not require the optical element to be the only structure in the space. Rather, the specification provides that the space may include other structures:

> In some embodiments the sealing window 126 is arranged to seal against the touch surface 102 and the interior underside surface 802 of the carrier 110. ***In other embodiments the sealing window 126 can be mounted between any other surface to provide a sealed cavity 116 around the emitters and detectors 103, 103'. In some embodiments the sealing window 126 seals between the interior underside surface 802 and [an] other surface. The other surface does not need to be the touch surface 102. Instead the other surface is another interior surface of the carrier 110 such as a surface on which the substrate 106 is mounted on. In some other embodiments the sealing window 126 is mounted and sealed against another components [sic] and neither of the touch surface 102 and the interior underside surface 802.***

'916 patent, 17:15-38 (emphasis added). The POSA would understand the phrase "the other surface is another interior surface of the carrier 110 such as a surface on which the substrate 106 is mounted on" to refer to the prior art's common practice of having an internal structure of the carrier/bezel extend out over the touch surface to receive one end of the infrared window, such that the carrier/bezel piece is disposed between the window and the touch surface. *See* JEX-09 (CN 203825586, highlighted in relevant part); JEX-10 (CN 104391611, highlighted in relevant part); JEX-11 (CN 203786707, highlighted in relevant part); JEX-12 (US 9,983,626, highlighted in relevant part); JEX-13 (WO 2014131221, highlighted in relevant part). Because the specification expressly contemplates embodiments in which the sealing window surfaces do not extend fully between either or both of the first portion and the panel and may extend between two portions of the support structure without reaching the panel surface, the POSA would understand that "fitted in the space between the panel and the first portion" refers to disposing the optical element into all, or a part of, the separation between the first part and the panel.

Regarding "sealing," the POSA would understand that the sealing window prevents the ingress of dirt, water, and other contaminants into the interior of the touch sensing apparatus but does not establish a perfect seal. The specification expressly defines "sealing":

> The sealing window 126 comprises a dual purpose. Firstly, the sealing window 126 provides a sealing around the perimeter 104 of the light transmissive panel 101. This means that the sealing window 126 prevents ingress of dirt, water and other contaminants into the interior of the touch sensing apparatus 100. This helps protect the internal components such as the plurality of emitters and detectors 103, 103'.

'916 patent, 16:26-34; *see also id*., 8:17-20; 17:15-18.

However, the disclosure does not explain the degree of effectiveness of the seal or otherwise provide any disclosure of any standard by which to assess the seal. The specification does provide several embodiments disclosing the use of deformable seals above and below the sealing window. *See id*. 15:35-41; 16:61-17:10; 19:4-10; 19:23-45; 20:4-12; 20:50-55; 20:65-67; 21:19-26, and Figs. 5 and 8-16. It also explains that such deformable seals are optional, such that a "seal" can arise simply from the engagement between the hard sealing window surface and the touch surface. *See id*., 15:30-41; 15:44-46; 15:56-58; 16:61-64; Fig. 2. The POSA would understand such arrangement would provide a less effective seal than would the deformable seal arrangements. Thus, the POSA would understand that the optical element would need to be disposed to prevent ingress of dirt, water, and other contaminants to a degree that would arise from simply engaging the sealing window with the touch surface. *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 904 F.3d 965, 972 (Fed. Cir. 2018) (explaining that POSA would understand claim term to encompass natural variation because, otherwise, claims would be limited to an inoperable result).

In contrast, Plaintiff's construction disregards the ordinary meaning of "fitted in" in favor of "filling," without providing any basis to justify rewriting the term in contrast to that ordinary

meaning while, simultaneously, excluding the specification's aforementioned express embodiments in which the sealing window surfaces do not completely fill the space. *See Thorner v. Sony Computer Entertainment Am. LLC*, 669 F.3d 1362, 1365-67 (Fed. Cir. 2012) (claims generally given ordinary meaning, absent lexicography or disavowal); *Steuben Foods, Inc. v. Nestle USA, Inc.*, 884 F.3d 1352, 1355-56 (Fed. Cir. 2018) (rejecting proposed construction that would exclude certain disclosed embodiments, even though still covering another disclosed embodiment, without any basis in claim language or specification for the exclusion). The '916 specification provides neither an express nor implied definition of "fitted in," nor any disavowal of scope that would lead to Plaintiff's proposal.

Plaintiff contends "filling" is correct in that only by "filling" the space can the optical element achieve the recited sealing function. *Supra*, pp. 65-66. Plaintiff's argument is based on the flawed premise that no structure can exist in the "space" between the panel and the first portion prior to being "filled" by the optical element. To the contrary, the claim language itself requires the first and second projections to extend into the "space," and the specification expressly discloses examples in which other structures, including the support structure, can extend into the claimed "space" so that the sealing window occupies less than the entirety of the separation or distance between the panel and the claimed first portion in fulfilling its sealing function.

c. FlatFrog's Reply Position

Promethean contends the Court should reject FlatFrog's construction because: (1) Webster's dictionary contains definitions supporting Promethean, and (2) FlatFrog's construction would not cover all embodiments in the specification.

But Promethean's definition of "fit" also includes "to conform correctly to the shape or size of" and "to conform to a particular shape or size." *Webster's* 467. Incorporating this definition into the claim results in: "an optical element *conforming correctly to the shape or size*

of the space between the panel and the first portion and configured to seal," consistent with FlatFrog's construction.

Claim 1 defines "the space" as extending "between" the first portion of the support structure (on the top end) and the panel (on the bottom end). The optical element extends to the top of "the space" because it engages with the receptacle in the support structure. The optical element extends to the *touch surface* of the panel because the optical element is "configured to seal the plurality of light emitters from contaminants" not from any surface but "from the touch surface." And the specification expressly describes these embodiments—where "the sealing window 126 is arranged to seal against the touch surface 102 and the interior underside surface 802 of the carrier 110." '916 patent,17:18-20.

Promethean relies on *other* embodiments where "sealing window 126 seals between the interior underside surface 802 and [an] other surface" that "does not need to be the touch surface 102." There, the sealing window "seal[s] against []other components" that are "neither of the touch surface 102 and the interior underside surface 802." *Id.* at 17:20-32. In these *other* embodiments, some other structure, not the sealing window, seals against the touch surface. But claim 1 is directed to embodiments that seal against the touch surface because it says so: the optical element is "configured to seal . . . from contaminants from the *touch surface*." *Id.* at claim 1 (emphasis added). Moreover, the claims need not be construed to cover every embodiment in the specification, especially where the claims cover specific preferred embodiments. *See, e.g.*, *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 983 F.3d 1367, 1378-80 (Fed. Cir. 2021); *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 747, 755 (Fed. Cir. 2016) (rejecting proposition that "each and every claim ought to be interpreted to cover each and every embodiment"). Claim 1 defines "a space" between the support structure and the touch panel,

recites an optical element fitted in that "space," and requires that the optical element seal the emitters "from contaminants from the touch surface."

The claimed "seal . . . from contaminants" does not require perfect sealing. FlatFrog agrees with Promethean it need only "prevent[] the ingress of some, but not necessarily all, dirt, water and other contaminants." Because there is no dispute, and a skilled artisan would understand the meaning of "seal . . . from contaminants," the Court need not construe this term further. Rather, the "configured to seal" element indicates that the claimed optical element, not some other element, is configured to seal *against* the touch surface. *See also, e.g.*, '916 patent, 8:17-20, 15:30-34, 15:59-63, 16:26-33, 16:59-60.

d. Promethean's Sur-Reply Position

Plaintiff argues in reply that the disclosure that the sealing window can extend between structures also fitted in the space between the touch plate and the upper frame member simply represents non-covered embodiments. Plaintiff's logic fails because the question before the Court is the correct construction of the "fitted in" term. The patent's express disclosure that contradicts Plaintiff's construction, but supports Defendants' construction, is relevant to the Court's analysis.

Moreover, Plaintiff's proposed construction not only excludes the disclosure related to the intervening structures, it excludes *all* the patent's embodiments. Plaintiff proposes that "optical element" should be construed as "sealing window" and that the "fitted in" term means "filling the space between the panel and the first portion." In its annotated illustrations of Figures 5A and 9 of the '916 patent, Plaintiff highlights in yellow what it considers the support structure's "first portion" to be. In neither figure does the "sealing window" "fill" the space between the highlighted "first portion" and the touch panel in either dimension illustrated in the figures. In Figure 5A, mounting unit 140 is disposed between the touch panel and the sealing window, whereas two gasket seals above and below sealing window 126 in Figure 9 preclude the sealing window from

"filling" the space between the first portion and the touch panel vertically. Additionally, neither sealing window in these figures extends the horizontal length of the "space" between Plaintiff's yellow-highlighted "first portion" and the touch panel. No other embodiment in the patent has a sealing window that, as Plaintiff proposes, "fills" such a space horizontally.

Plaintiff argues that claim 1 requires the optical element to extend entirely to the touch surface because the claim requires the optical element to be configured to seal against contaminants that originate "from" the touch surface. The claim's identification of the touch surface as the contaminant source does not require the optical element to engage that source in order to effect a seal, particularly when the specification *expressly* explains that the sealing window (on which the optical elements are defined in the disclosed embodiments) can seal the cavity in which the emitters are disposed by engaging structures other than the touch surface, such as another portion of the support structure. *See* '916 patent, 17:20-28.

5. "supported by" (claim 3 of '916 patent)

FlatFrog's Proposed Construction	Promethean's Proposed Construction
directly joined to	directly or indirectly held in position by

a. FlatFrog's Opening Position

The parties dispute the meaning and scope of the phase "supported by" within the longer claim term of "wherein the plurality of emitters are mounted on an electronics board that is **supported by** the second portion [of the support structure]." '916 patent at 22:47-48 (emphasis added to disputed element). The fundamental difference between the parties' constructions is whether this term requires "direct" support (as FlatFrog contends), or whether it permits indirect support (as Promethean contends). As detailed below, FlatFrog's construction should be adopted because it is consistent with the problems addressed by the '916 patent, supported by specific

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embodiments in the specification, and because Promethean's proposed construction would render this element superfluous.

The '916 patent seeks to address problems with prior art designs that resulted in sub-optimal alignment of components resulting from the multiple components required in those designs. *Id.* at 1:62-67. Optical touch systems can be difficult to mass manufacture due to "the small tolerances with respect to the alignment of the components" because, for example, "the light emitters and detectors [which are mounted on an electronics board] need to be precisely aligned in relation to various lenses." *Id.* at 2:9-20. Thus, one goal of the embodiments disclosed in the '916 patent is to "minimize the number of electro-optical components" and to make a more compact system. *See, e.g.*, *id.* at 2:20-22.

Further to these objectives, the specification describes an embodiment where the electronics board (substrate 106) is "directly join[ed]" to the second portion of the support structure (carrier 110) as depicted in Figure 2 below. *See generally id.* at 7:10-9:30; Figure 2.

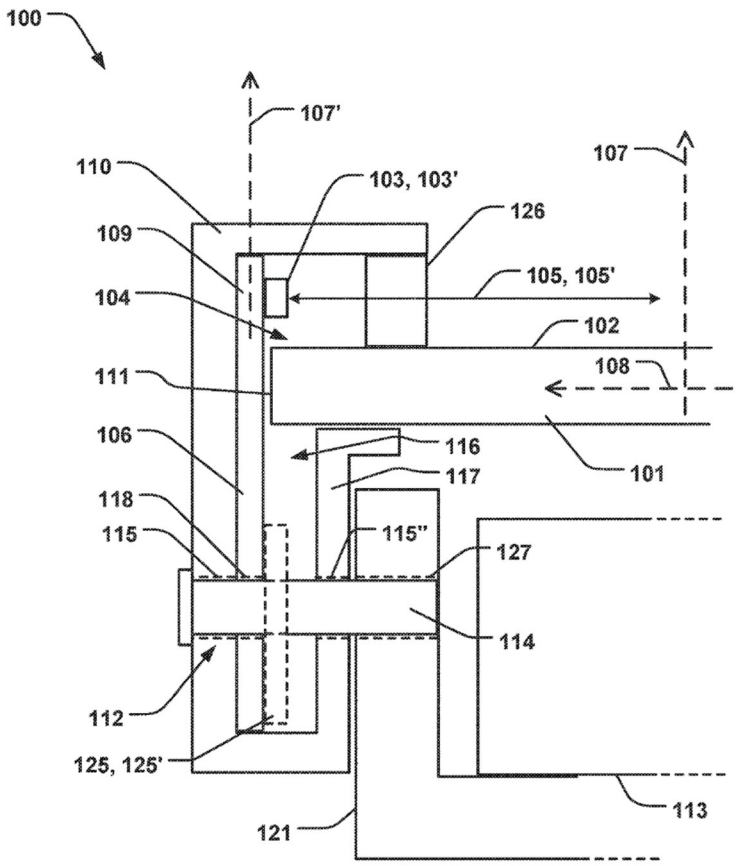


FIG. 2

The '916 patent discloses an embodiment of the invention that includes "attaching a substrate having a plurality of light emitters and detectors to a carrier." *Id.* at 4:17-20. As described in the specification, "substrate 106 may be fixed to a carrier 110 mounted around the perimeter 104 of the light transmissive panel 101." *Id.* at 8:60-61. "By directly joining the substrate 106 to the carrier 110 provided around the perimeter 104, the assembly of the touch sensing apparatus 100 may be further facilitated, as the amount of components can be kept at a minimum." *Id.* at 8:62-66. "For example, the substrate 106 can be accurately fixed in relation to the carrier 110, due to the small tolerances possible in the direction of the substrate 106 aligned in parallel with the normal axis 107 in FIG. 2." *Id.* at 8:66-9:3. This enables "accurate positioning of the emitters and

detectors 103, 103', in relation to the light transmissive panel 101" and allows "a compact mounting around the perimeter 104." *Id.* at 9:7-13.

Dependent claim 3, requiring that the electronics board "is supported by the second portion" of the support structure, is directed to preferred embodiments such as those described in the specification where the electronics board is "directly join[ed]" to the support structure. *See id.* at 8:60-9:19 and Figs. 2-3. And while it is generally improper to import limitations into the claims from embodiments in the specification, it is also perfectly permissible for the patent owner to draft dependent claims to expressly cover specific embodiments. *PPC Broadband*, 815 F.3d at 755 (rejecting the proposition that "each and every claim ought to be interpreted to cover each and every embodiment"); *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010) ("It is not necessary that each claim read on every embodiment."); *TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1373 (Fed. Cir. 2008) ("Our precedent is replete with examples of subject matter that is included in the specification, but is not claimed."). When the electronics board is directly joined to the support structure, the number of components is reduced, the emitters and detectors may be precisely aligned, and the result is a touch sensing apparatus suitable for mass production. *See, e.g.*, '916 patent at 9:40-47, 9:64-66.

Promethean's construction seeks to broaden the scope of claim beyond what the specification describes. First, Promethean has not identified any embodiment in the '916 patent where the electronics board is described as *indirectly* supported by the support structure. Rather, every figure of the '916 patent depicting the electronics board (Figures 2, 3, 5A, 8-12, 14) shows it in direct (not indirect) contact with the second portion of the support structure. The only figures depicting the connection between the electronics board and the support structure (Figures 2 and 3)

show that the electronics board is "directly join[ed]" to the support structure, as described in the patent.

Promethean's construction would also render this element superfluous. The claims of the '916 patent recite a touch sensing apparatus comprising a "support structure." The support structure is the outer frame of the touch sensing apparatus. The support structure has two portions, a "first portion" (recited in claim 1) and a "second portion" (recited in claim 2). The first portion is parallel to the touch surface and is the frame on the front (user-facing) side of the touch sensing apparatus. The second portion extends perpendicularly from the first portion and is the frame along the side of the touch sensing apparatus. Promethean's construction permitting "indirect" support would render superfluous the following element: "an electronics board that is supported by the second portion [of the support structure]." First, because the "support structure" is the outer frame of the touch sensing apparatus, everything within it is necessarily indirectly held in place by it. In other words, everything within the touch sensing apparatus is, to some extent, held in place by the support structure. Second, even though the claim expressly recites an "electronics board that is supported by *the second portion* [of the support structure]," Promethean's proposed construction would encompass situations where the electronics board is directly joined to *the first portion* of the support structure (or any other portion of the support structure) because the first portion of the support structure (or any other portion) is necessarily connected to the second portion of the support structure. Thus, FlatFrog's proposed construction, requiring the electronics board to be directly joined (i.e., not through any intermediate components) to the second portion of the support structure properly gives effect to the language of claim 3. Promethean's proposed construction seeks to substantially broaden this term so that it has no meaning at all.

b. Promethean's Answering Position

The parties dispute whether the claim term requires that the emitter electronics board (1) be joined, or merely held in position by, the second portion of the support structure that is perpendicular to the first portion, and (2) be "directly" supported by the second portion of the support structure that is perpendicular to the first portion.

Defendants' construction is based on the ordinary meaning of "support," as the POSA would understand that term in view of the specification: to hold in position. *See Webster's* 1186 (defining "support" as: to hold up or serve as a foundation or prop for). For example, the claim language provides that "an electronics board … is supported by the second portion." '916 patent, claim 3. Thus, the POSA would understand that "support" refers to the second portion holding the electronics board in position. *See id*. at 8:60-9:13; 9:17-19; 9:55-64; 10:5-11; 10:25-30; 13:4-11 (describing the fixing or supporting of the substrate 106 (the electronics board) to the carrier 110).

The specification uses the word "fix" or the phrase "directly joined" to describe how the electronics board is attached to the carrier/bezel (110), but it also uses the word "support" to describe the more general relationship between the components, and it does so by contrasting the words "support" and "fix":

> From a similar aspect, the fixing elements 112 may be configured to fix the position of the substrate 106 in relation to the display unit 113, 121. This may be seen as a consequence from the above, i.e. the fixing elements 112 contributing to the fixing of the substrate 106 to the carrier 110, which in turn is fixed to the display unit 113, 121, **in which case the carrier 110 may act as a further support for the substrate 106**.

Id., 9:66-10:8 (emphasis added); *see id*., 10:9-11 (referring to "support" of substrate 106 by carrier); 9:57-60 ("the fixing elements 112 may also **fix or at least support** the position of the substrate 106 in relation to the carrier 110") (emphasis added). The specification describes both

support through fixation between the carrier and substrate and support without fixation between the carrier and substrate.

But while the specification used the terms "fixed," "directly joined," or "support," patentee chose to use "supported" in the claims. Plaintiff fails to identify evidence that the patentee acted as its own lexicographer regarding this term or that the patent's scope was disavowed. Plaintiff argues that "supported by" should be rewritten as "directly joined" because the specification refers to "directly joining" the substrate 106 to the carrier 110 to thereby enhance objectives of improved emitter/detector alignment and ease of construction. *Supra*, pp. 73-75. Yet, Plaintiff ignores the specification's teaching, referenced above, that there is a difference between the terms, such that the substrate can be "fixed" (which would encompass direct joinder) to the carrier but, on the other hand, could be "at least [supported]" by the carrier.

Furthermore, the absence of the word "directly" in the claim means the patentee did not intend for "directly" to be a limitation. The specification includes several instances of the use of the words "fix," "join," "support," and other words of mechanical relationship, without modification by the word "direct" or "directly." In other instances, it does modify such words with "directly." *See* '916 patent, 3:36-41 (directly interlock); 8:50-56 (directly joined); 8:62-66 (directly joining); 9:13-16 (mounted directly); 9:20-28 (directly supporting); 9:35-39 (directly joined); 10:5-8 (fix…directly); 10:33-40 (directly fix); 13:15-19 (directly interlock); 13:20-23 (directly connect); 17:35-38 (mounted directly). Because the patentee knew how to use "directly" when desired, but did not use "directly" to modify "support" in claim 3, "directly" should not be read into the claim. *See Phillips*, 415 F.3d at 1314 (reference to "steel baffles" in claim indicates "baffle" should not be construed to require steel).

Plaintiff argues that a patentee is free to limit its claims to fewer than all disclosed embodiments. *Supra*, p. 75. This truism is unavailing to Plaintiff because it is necessary for the patentee to utilize language that achieves the desired limitation.

Plaintiff next argues that Defendants' construction is incorrect on grounds that it would render the claim element superfluous. *Supra*, p. 76. Plaintiff's arguments are misplaced. While Plaintiff presumes the claim requires that the claimed "support structure" necessarily holds all other claim elements in place, the claim does not expressly require that relationship. Thus, there is nothing superfluous about calling out the "supported by" relationship in claim 3 as it relates to the electronics board. Further, even if Plaintiff's construction of "support structure" is correct, the limitation is not superfluous in that it calls for support by the support structure's second portion, as opposed to other portions. Similarly, Plaintiff's second argument presumes a load bearing relationship between the support structure's first and second portions for which the claim does not expressly call, such that recitation of the "the second portion" is not superfluous.

Finally, Plaintiff's argument that "directly joined" precludes connection between the electronics board and the support structure through "intermediate components" fails because the only basis Plaintiff provides for this assertion, i.e. '916 patent, Fig. 2, illustrates an intermediate component, i.e. mounting element 114, that connects the electronics board and the carrier. Thus, whatever Plaintiff may intend "directly joining" to mean, it does not require an absence of intermediate components.

c. FlatFrog's Reply Position

Promethean's brief mechanically cites Webster's for several disputed terms, including this one. Although this approach was originally endorsed in *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), it was overruled by *Phillips*, 415 F.3d at 1319-24 (*Texas Digital* places "too much reliance on extrinsic sources such as dictionaries . . . and too little on

intrinsic sources, in particular the specification and prosecution history".). And while FlatFrog has relied on some dictionary definitions, this one goes too far. Indeed, this Court need not even consult extrinsic evidence if the intrinsic evidence is clear, as here. *Eidos*, 779 F.3d 1365. "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

The '916 patent discloses a novel configuration of components to provide improved operation, simplified assembly, reduction in the number of components, and a reduction in the size of the bezel in a touch sensing device. Consistent with these objectives, the patent describes an embodiment (depicted in Figure 2 above) where the emitters and detectors are mounted on an electronics board (substrate 106) that is "directly join[ed]" to the support structure (carrier 110). '916 patent, 8:62-9:13. This allows the electronics board to be "accurately fixed" to the support structure, enables "accurate positioning" of the emitters and detectors, and allows a "compact mounting"—hitting each of the objectives in the '916 patent. *Id.*

Promethean identifies no embodiment in the '916 patent where the electronics board is *indirectly* held in position by the support structure. And while it is generally improper to limit the claims to features that appear in some disclosed embodiments, *Thorner*, 669 F.3d at 1366, FlatFrog is not seeking to limit independent claim 1 to embodiments where the "electronics board" is directly joined to the "second portion" of the support structure. Rather, FlatFrog seeks to have dependent claim 3 cover these embodiments, as in Figure 2 (as was intended), rather than have the scope of this claim expanded to the point of being meaningless.

Promethean's remaining arguments fare no better. First, Promethean contends its construction would not render claim 3 superfluous because claim 3 "calls for support by the

support structure's second portion, as opposed to other portions." But that misses the point. Because the claimed "first portion" and "second portion" are part of the same "support structure," an electronics board directly supported by the first portion (and not the second) would still be indirectly supported by the second portion because the second portion is part of the same "support structure." Under Promethean's proposed construction, it would be superfluous to call for a specific portion of the singular support structure to provide indirect support when the entire structure as a whole would necessarily provide support—and all portions of the entire structure would at least provide indirect support through the other portions.

Second, Promethean's final argument that "directly joined" does not foreclose intermediate components also misses the mark. FlatFrog's point was only that intermediate components should not come *between* the electronics board and the second portion of the support structure because then the electronics board would not be directly joined to the second portion of the support structure—which would increase size, inject manufacturing tolerances, and reduce precision.

d. Promethean's Sur-Reply Position

Plaintiff complains that Defendants have pointed to no example of "indirect" support in the patent. Plaintiff's premise is flawed, in that the all-encompassing phrase "directly or indirectly" merely reflects that the claim requires neither "direct" nor "indirect" support, only "support."

Plaintiff again argues that "direct join[der]" between the electronics board and the support structure achieves objectives recited in the '916 specification and, thereby, supports its proposed construction. However, Plaintiff again fails to provide any basis for a conclusion that the patentee disavowed subject matter or acted as its own lexicographer in ways that would modify "supported by" from its ordinarily understood meaning.

Even if direct joinder is a subset of the scope of "support" that the '916 patent discloses, Plaintiff argues that the narrower interpretation is appropriate because the phrase under

construction appears in a dependent claim. Whether claim 3 is dependent or independent, Plaintiff chose to use the word "supported." Not "directly supported." Not "joined" or "directly joined."

Plaintiff again argues that Defendants' proposed construction would render the term "support" superfluous. The premise is that the "support structure" necessarily holds all components in the touch sensing apparatus, including the electronics board, in position and that all components of the support structure necessarily hold all other components of the support structure in position. However, the claims do not require those relationships. For instance, nothing in the claims requires a relationship between the first and second portions of the support structure such that each portion holds the other in position. Further, Plaintiff's reply brief reveals that, whatever Plaintiff may intend "directly joined" to mean, Plaintiff intends the term to require a direct physical abutment. If Plaintiff complains that "support" is broad, Plaintiff provides no explanation why it would follow that the term should then be interpreted to such a narrow extent.

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