

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYUNDAI MOTOR AMERICA, INC.
Petitioner,

v.

GERM DOME INDUSTRIES LLC
Patent Owner.

Case No. PGR2026-00030
U.S. Patent No. 12,296,061

**PETITION FOR *POST-GRANT* REVIEW
OF U.S. PATENT NO. 12,296,061**

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LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 12,296,061 to Schumacher (“the ’061 Patent”)
1002	Prosecution file history for the ’061 Patent
1003	Declaration of Dr. Michael Lebby
1004	<i>Curriculum Vitae</i> of Dr. Michael Lebby
1005	Japanese Patent Application Publication No. 2003/307049, published October 31, 2003 to Watanabe et. al. (“Watanabe”)
1006	Certified Translation of Japanese Patent Application Publication No. 2003/307049, published October 31, 2003 to Watanabe et. al. (“Watanabe”)
1007	U.S. Patent Application Publication No. 2010/0108917, published May 6, 2010 to Stanley et. al. (“Stanley”)
1008	German Utility Model 202004017284, published on September 24, 2010 to Kuschel et. al. (“Kuschel”) with machine translation
1009	Japanese Patent Application Publication 2010209513, published on September 24, 2010 to Shirai et. al (“Shirai”) with machine translation
1010	<i>The Ultraviolet Disinfection Handbook</i> 25–27 (American Water Works Association 2008)
1011	Vilhunen et al., <i>Ultraviolet Light-Emitting Diodes in Water Disinfection</i> , 16 Environ. Sci. Pollut. Res. Int. (2009)
1012	U.S. Patent No. 3,737,214, published on June 5, 1973 (“Shimizu”)
1013	U.S. Patent No. 6,865,028, published on March 8, 2005 (“Moustier”)
1014	U.S. Patent No. 8,064,149, published on November 22, 2011 (“Kweon”)
1015	Complaint in Related Action

LISTING OF CLAIMS

Element	Claim 1
[1pre]	An apparatus for sanitizing an object, the apparatus comprising:
[1a]	a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including:
[1a.i]	a first end wall located at a first end of the interior cavity and having a first end wall interior surface at least partially defining the interior cavity;
[1a.ii]	a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and
[1a.iii]	a second end wall on an opposite end of the interior cavity from the first end wall having a second end wall interior surface at least partially defining the interior cavity,
[1b]	wherein the second end wall at least partially defines an opening into the interior cavity; and

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[1c]	at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity.
Element	Claim 2
2	The apparatus of claim 1 , wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.
	Claim 3
3	The apparatus of claim 2 , wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.
	Claim 4
4	The apparatus of claim 2 , wherein at least one of the first germicidal light source or the second germicidal light source are cylindrical light sources.

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	Claim 5
5	The apparatus of claim 1 , wherein the at least one germicidal light source forms a projection into the interior cavity and is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.
	Claim 6
6	The apparatus of claim 1 , wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are UV reflective and configured to reflect germicidal light from the at least one germicidal light source toward the object.
Element	Claim 7
7	The apparatus of claim 6 , wherein the second end wall comprises a curved structure with the second end wall interior surface following a curvature of the curved structure.
Element	Claim 8
8	The apparatus of claim 7 , wherein the curved structure is fixed relative to the germicidal light source.

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Element	Claim 9
9	The apparatus of claim 1 , wherein the at least one germicidal light source is attached to the sidewall and spaced from the first end wall and the second end wall and the sanitizing surface is a point-of-contact sanitizing surface.
Element	Claim 10
10	The apparatus of claim 1 , wherein the first end wall is a posterior end wall, the second end wall is an anterior end wall, and the sidewall is coupled with the posterior end wall and projects in an anterior direction relative to the posterior end wall.
	Claim 11
[11pre]	An apparatus for sanitizing an object, the apparatus comprising:
[11a]	a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including:
[11a.i]	a posterior wall located at a first end of the interior cavity, the posterior wall having a posterior wall interior surface at least partially defining the interior cavity;

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[11a.ii]	a sidewall extending from and integral with at least a portion of the posterior wall, the sidewall having a sidewall interior surface at least partially defining the interior cavity; and
[11a.iii]	an anterior wall on an opposite end of the interior cavity from the posterior wall having an anterior wall interior surface at least partially defining the interior cavity,
[11b]	wherein the anterior wall at least partially defines an opening into the interior cavity; and
[11c]	at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity, wherein the posterior wall interior surface, the anterior wall interior surface, and the sidewall interior surface are UV reflective and configured to reflect germicidal light from the at least one germicidal light source toward the object.

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Element	Claim 12
12	The apparatus of claim 11 , wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.
Element	Claim 13
13	The apparatus of claim 12 , wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.
Element	Claim 14
14	The apparatus of claim 11 , wherein the at least one germicidal light source is attached to the sidewall and spaced from the posterior wall and the anterior wall and the sanitizing surface is a point-of-contact sanitizing surface.
Element	Claim 15
15	The apparatus of claim 11 , wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.

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Element	Claim 16
16	The apparatus of claim 11 , wherein the anterior wall comprises a curved structure with the anterior wall interior surface following a curvature of the curved structure.
Element	Claim 17
17	The apparatus of claim 16 , wherein the curved structure is fixed relative to the germicidal light source.
Element	Claim 18
[18pre]	An apparatus for sanitizing an object, the apparatus comprising:
[18a]	a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including:
[18a.i]	a first end wall located at a first end of the interior cavity and having a first end wall interior surface at least partially defining the interior cavity;
[18a.ii]	a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and

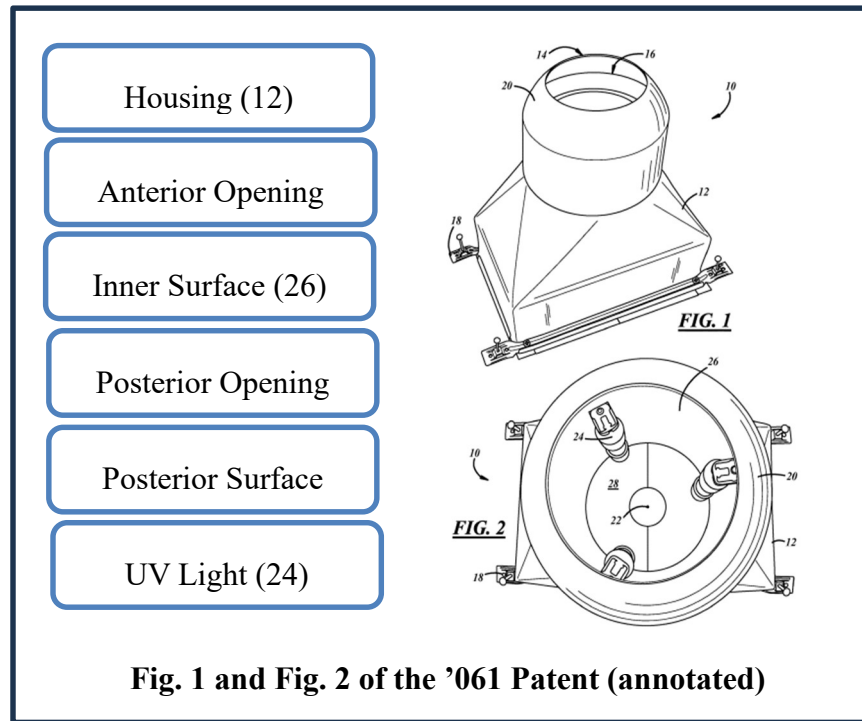
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[18a.iii]	a second end wall on an opposite end of the interior cavity from the first end wall, the second end wall having a curved structure and a second end wall interior surface at least partially defining the interior cavity, wherein the second end wall at least partially defines an opening into the interior cavity; and
[18b]	at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity.
Element	Claim 19
19	The apparatus of claim 18 , wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.
Element	Claim 20
20	The apparatus of claim 19 , wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are configured to reflect germicidal light from the at least one germicidal light source toward the object and the sanitizing surface is a point-of-contact sanitizing surface.

I. INTRODUCTION

Petitioner requests Post-Grant Review (“PGR”) of Claims 1-20 (“Challenged Claims”) of U.S. Patent No. 12,296,061 (the “’061 Patent,” EX1001). The Patent Trial and Appeal Board (“Board”) should institute PGR because this Petition, supported by the declaration of Dr. Michael Lebby (Ex. 1003), demonstrates it is more likely than not that at least one Challenged Claim is unpatentable.

The ’061 Patent is directed to an apparatus for sanitizing objects, particularly “point of contact” surfaces such as doorknobs, elevator buttons, and other control panels. Ex. 1001, 1:55–58. Each independent claim of the ’061 Patent recites the inclusion of “at least one germicidal light source” as a sanitizing agent that “provides germicidal light into the interior cavity” of the apparatus. Ex. 1001, Cls. 1,11, 18.



The '061 Patent specification acknowledges that point-of-contact surfaces used by large groups of people are known to facilitate the spread of communicable germs. Ex. 1001, 1:36–39. It further explains that such spread may be reduced through periodic sterilization or sanitization of these surfaces. Ex. 1001, 1:46–49. The specification also admits that it is well known that certain frequencies of electromagnetic energy—specifically light—may be used as sanitizing agents, including ultraviolet (UV) light and high-intensity, narrow-spectrum (HINS) light. Ex. 1001, 3:31–62.

Beyond what is already known, the specification does not claim to disclose any improvement over the prior art devices or background art cited therein. *See*

generally Ex. 1001. Instead, it simply states that the claimed apparatus provide certain “advantages,” including positive effects associated with the sanitization of point-of-contact surfaces, flexibility in the size and shape of the apparatus, the use of various construction materials, and power efficiency. Ex. 1001, 8:57–9:14.

These statements merely describe general characteristics of the apparatus, however, rather than specific technical benefits or improvements.

Every structural and functional element of the claimed sterilizing apparatus was previously disclosed in the prior art, and the intrinsic record reflects no technical improvements or inventive contribution beyond what was already known. In view of the prior art cited herein, the claimed subject matter is anticipated and also would have been obvious to a person having ordinary skill in the art at the time of the alleged invention (“POSITA”).

Accordingly, Petitioner respectfully requests that the Board find all Challenged Claims unpatentable as anticipated and/or obvious.

II. REQUIREMENTS FOR POST GRANT REVIEW

This Petition complies with all statutory requirements and 37 C.F.R. §§42.201 *et seq.* and should be accorded a filing date pursuant to 37 C.F.R. §42.206.

A. Grounds for Standing

Petitioner certifies that the '061 Patent is available for PGR and that Petitioner is not barred or estopped from requesting PGR challenging Claims 1–20. 37 C.F.R. §42.204(a); 35 U.S.C. §325(e)(1).

This Petition is filed less than 9 months after the issue date of the '061 patent (May 13, 2025). 37 C.F.R. §42.202; 35 U.S.C. §321(c).

The '061 Patent is eligible for PGR because it issued from a patent application filed on August 14, 2024, after enactment of the America Invents Act (“AIA”).

B. Identification of Challenge and Requested Relief

Under 37 C.F.R. §§42.204(b) and 42.22, Petitioner requests that the Board institute PGR on Challenged Claims, 1–20, and cancel them as unpatentable. The prior art references combined to form the Grounds are:

Exhibit No.	Reference	Prior Art
1006	JP 2003307049 A (“Watanabe”) ¹	35 U.S.C § 102(a)(1)
1007	US 2010/0108917 (“Stanley”) ²	35 U.S.C. § 102(a)(1) OR (2)

¹ Watanabe was published on October 31, 2003.

² Stanley was filed on November 6, 2008, and published on May 6, 2010.

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The Grounds asserted are:

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–5, 10	102	Anticipated by Watanabe
2	1–20	103	Obvious over Watanabe
3	1–20	103	Obvious over Watanabe in view of Stanley

III. CLAIM CONSTRUCTION

In PGR, claim terms are construed under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*) and its progeny. 37 C.F.R. §42.200(b). The Board, however, only construes claim terms when necessary to resolve the controversy. *See, e.g., Toyota Motor Corp. v. Cellport Sys., Inc.*, No. IPR2015-00633, Paper No. 11 at 16 (PTAB. Aug. 14, 2015).

For the purposes of this Petition, Petitioner gives the claim terms in the '061 Patent their plain and ordinary meaning that they would have to a POSITA in view of the intrinsic evidence. Petitioner's interpretation of claim terms is further explained for each claim limitation in relation to the prior art discussed in invalidity Grounds 1, 2, and 3, below.

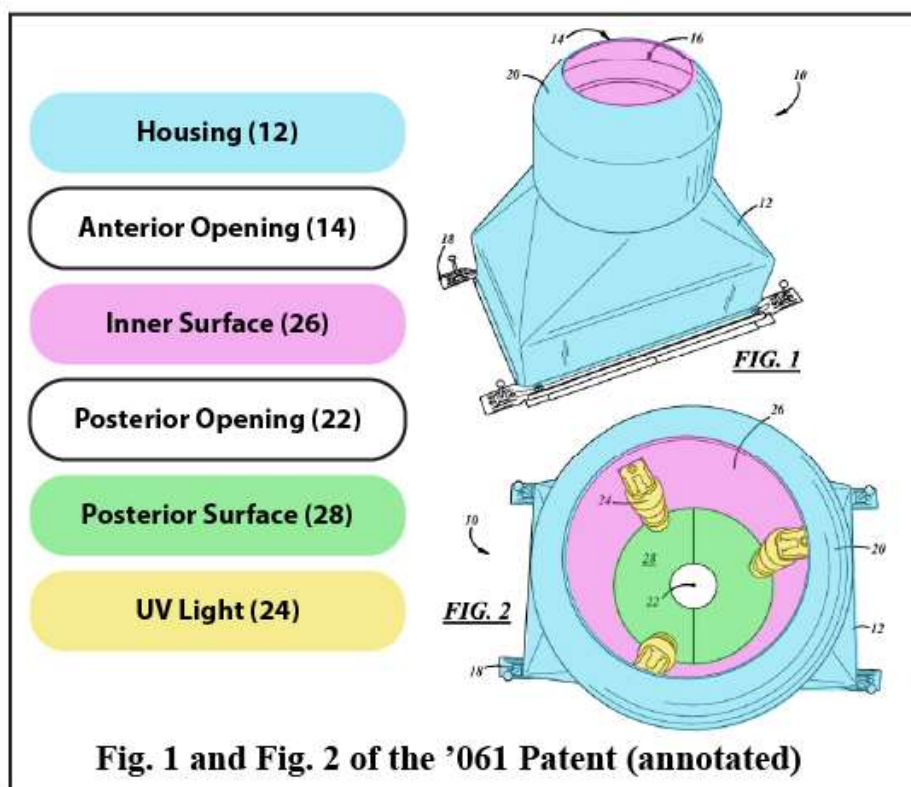
IV. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA with respect to the '061 Patent would have possessed at least a bachelor's degree in electrical engineering, physics, mechanical engineering, or a closely related field and at least two years of practical experience in design, development, powering and controlling electrical systems, including work with electrical light sources, as well as similar experience designing and developing housings and fixtures for electrical components. Ex. 1003, ¶ 30–34.

V. OVERVIEW OF THE '061 PATENT

A. Summary Of The '061 Patent

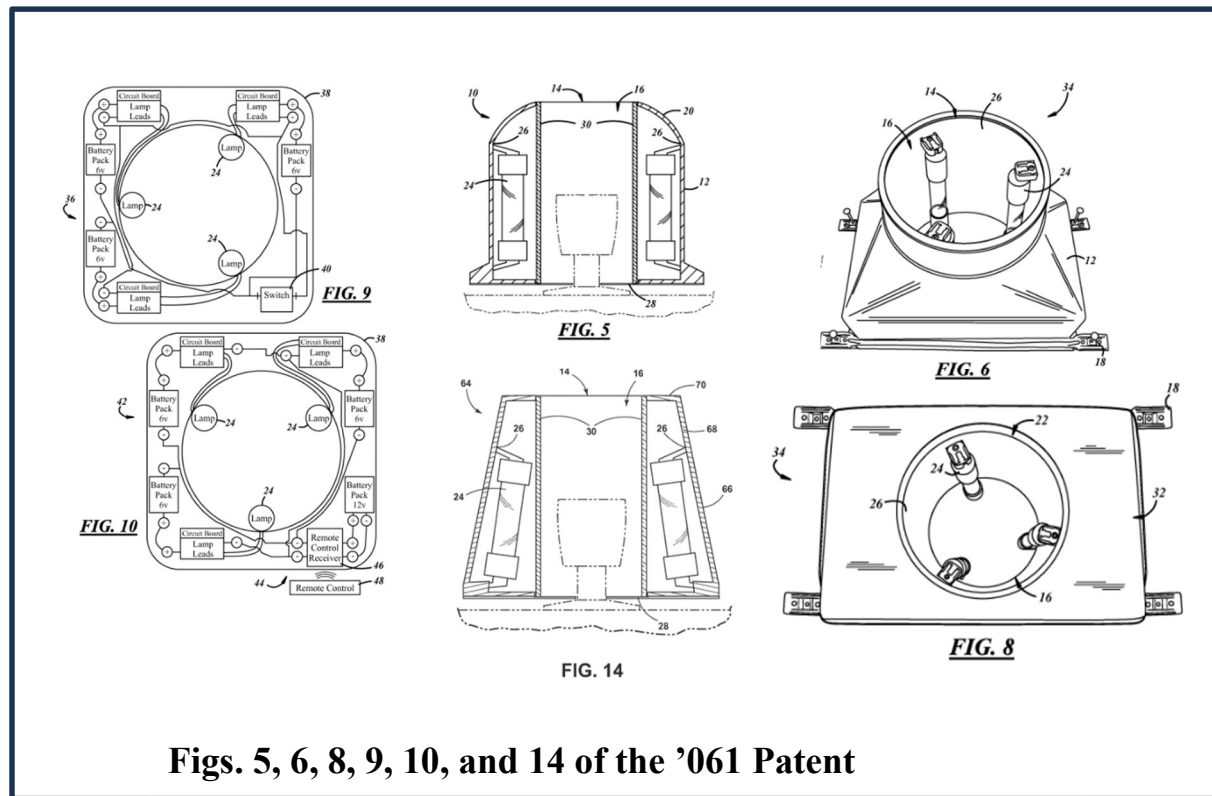
The '061 Patent is directed to an apparatus for sanitizing point-of-contact surfaces using a sanitizing agent, specifically UV light, while allowing individuals to access and use the point-of-contact surface (e.g., a doorknob) when the apparatus is attached to it or otherwise has the point-of-contact disposed within the interior cavity. Ex. 1001, 1:27–32, 1:55–67.



Figures 1 and 2 depict the primary embodiment of the **sanitizing apparatus**, comprising a **housing 12** with multiple **UV light sources 24** mounted within an **interior surface 26**, and having a **posterior surface 28** with an **opening 22**, and **another anterior opening 14** opposite the posterior surface. Ex. 1001, 3:65–4:42, 5:38–45, Figs. 1, 3. The housing of the apparatus has two openings: (1) a “**posterior opening**” “refer[ing] generally to the end of [the] apparatus or system... proximate to a point of contact or to a structure to which the point of contact is attached (e.g., a wall or door)” and “through which at least a portion of the point-of-contact surface may extend into the interior,” and (2) an “**anterior**

opening” “refer[ing] generally to the end of the apparatus or system through or by which a human user may access the point of contact, such as by extension of a hand through [the] anterior opening.” Ex. 1001, 2:4–6, 4:2–5, 4:6–9.

The remaining Figures (representative samples shown above) depict other embodiments of the sanitizing apparatus with different housing configurations and UV light source mounting locations. *See generally* Ex. 1001, 3:65–6:67, Figs. 5, 6, 7, 8, 10, 14. The specification discusses certain electrical circuitry for controlling the UV light sources, which is not claimed, and depicts such circuitry representatively in Fig. 9 and Fig. 10. Ex.1001, 7:11-8:19, Figs. 9, 10.



The apparatus of the '061 Patent purportedly achieves the goal of sanitizing point-of-contact surfaces by using a combination of one or more UV light sources and reflective materials. Ex. 1001, 1:55–67. The one or more UV light sources provide germicidal light into the interior of the housing, which contains at least a portion of the point-of-contact surface. *Id.* The inner surface of the housing, forming the interior cavity, “may comprise aluminum, glass, or another reflective material, and/or may be coated with a reflective layer.” Ex. 1001, 5:14–16. This purportedly allows for “reflect[ing] or direct[ing] the sanitizing agent towards a location where the point-of-contact surface is to be disposed when the apparatus [] is installed, thereby increasing the exposure of the surface to the sanitizing agent.” Ex. 1001, 5:4–8.

B. Prosecution History

The '061 Patent issued from Application No. 18/804,396 (“’396 Application”), filed on August 14, 2024. The '396 Application is a continuation of a larger family of six applications, one of which is a continuation-in-part, and claims priority to March 23, 2011. Ex. 1001 (Related U.S. Application Data). While Petitioner does not concede that the '061 Patent is entitled to the March 23, 2011 priority date, it applies that date herein. The same Examiner examined each of these applications.

During prosecution, the Examiner issued an immediate Notice of Allowance for the '396 Application without any prior office actions, stating that “[t]he prior art

does not appear to teach or make obvious the claimed apparatuses for sanitizing an object.” Ex. 1002 at 219 (’061 Patent Notice of Allowance).

VI. OVERVIEW OF THE STATE OF THE ART

The ’061 Patent is directed to the sterilization or sanitization of surfaces or objects that are frequently touched and contaminated with germs, thereby contributing to the spread of communicable illnesses. *See generally* Ex. 1001, 1:27–67. For example, “[i]n hospitals, germs communicated through points of contact can lead to increased patient sickness [and] [i]n an office environment, germs communicated through points of contact can lead to sick employees and lost productivity.” Ex. 1001, 1:39–43. This problem is purportedly solved by taking advantage of the natural germicidal properties of UV light. Ex. 1001, 1:62–67.

Well before the time the ’061 Patent was filed, however, the germicidal properties of UV light **were already well-known**, and devices utilizing UV lights to sterilize objects and surfaces had long been deployed. Ex. 1003, ¶ 64–71. In particular, UV technology has long been used to damage the DNA and RNA of bacteria, viruses, and other pathogens, and the use of UV light for hygiene related applications was well-known before the time of the alleged invention of the ’061 Patent. *Id.* at ¶ 65. Studies have also identified UV light emitting from diodes as an effective method for bacterial disinfection. *Id.* at ¶ 66.

**PETITION FOR *POST-GRANT* REVIEW
OF U.S. PATENT NO. 12,296,061**

The idea of containing a sanitizing agent or energy, such as UV light, when developing a device for sanitizing objects or areas frequently touched by people would have been an obvious solution to an obvious sanitary problem. *Id.* at ¶ 67.

For instance, this exact solution is disclosed not only in the prior art references discussed below invalidating the '061 Patent claims, but also in other prior art references directed to sanitizing points of contact. *Id.* at ¶ 68. For example, Japanese Patent No. JP 2010-209513 (“Shirai”), which predates the alleged priority date of the '061 Patent, discloses a sanitizing housing configured to irradiate sterilizing light for the purpose of sanitizing a handle. *Id.*

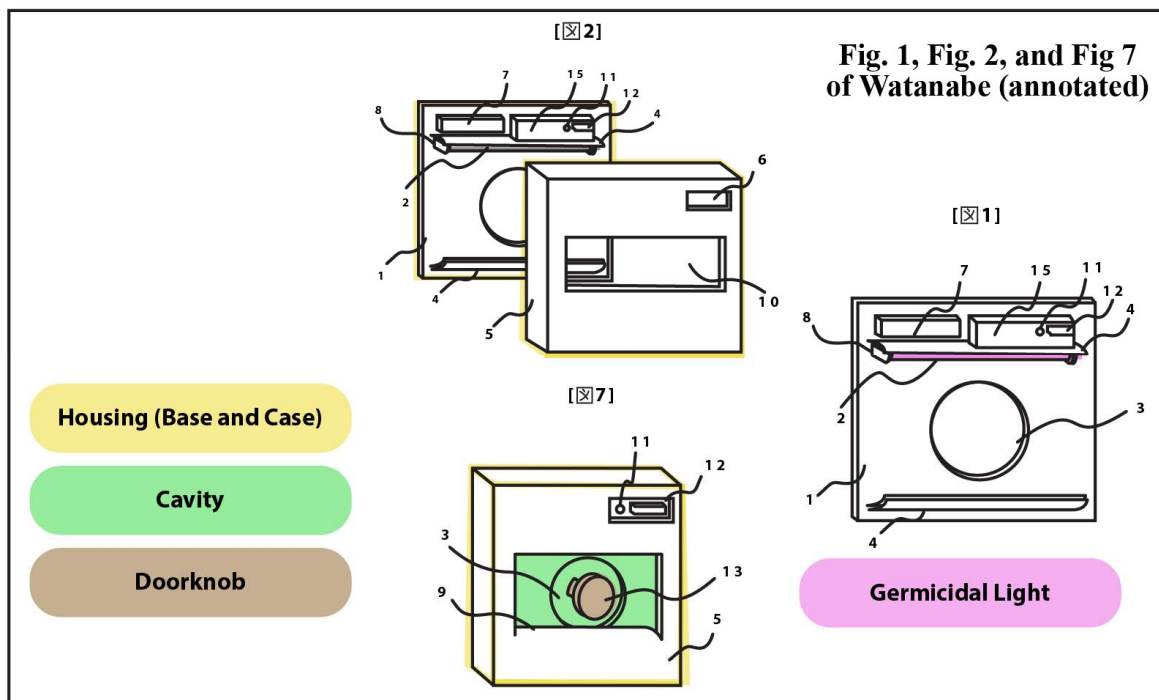
The prior art references relied on in this Petition, Watanabe and Stanley, disclose sanitizing housings which address the problem of reducing germ transmission from frequently contacted surfaces. *Id.* at ¶ 69. Accordingly, it would have been easily recognizable that these housings could take a variety of forms, including boxes, domes, or partial enclosures, and that the overall structural shape and internal surfaces could be designed to improve the effectiveness of the sanitization process. *Id.* at ¶ 70. Moreover, it would have been obvious to position one or more sanitizing sources within such a housing in order to irradiate or otherwise treat the target surface or object while minimizing user exposure. *Id.*

Each of the prior art references discussed below—Watanabe and Stanley—qualifies as analogous art because each discloses systems or methods for sanitizing

surfaces or objects and addresses the problem of reducing germ transmission from commonly contacted surfaces. *Id.* at ¶ 85. The '061 Patent likewise concerns the use of sanitizing agents or energy, specifically UV light, to mitigate contamination on such surfaces, placing the cited references within the same field of endeavor and directed to the same general problem. *Id.* at ¶ 71

A. Watanabe

Watanabe is a Japanese Patent available as prior art under 35 U.S.C. § 102(a)(1) as a “printed publication” because it was published on October 31, 2003.



Ex. 1006.

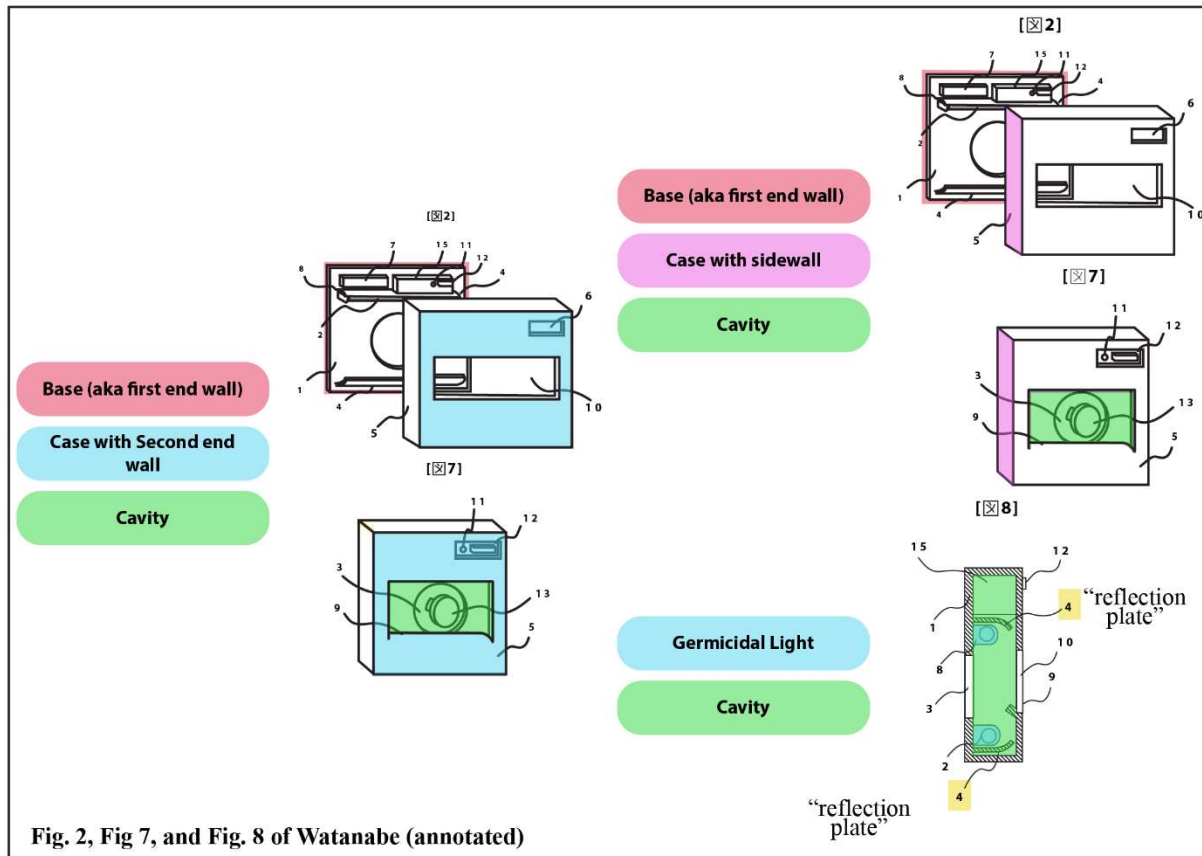
Watanabe discloses a sanitizing device for doorknobs, where the sterilizer is “attached to an arbitrary door such as a toilet, a kitchen, a hospital, etc., and sterilizes bacterial on the doorknob surface.” Ex. 1006, ¶ [0001].³

The device addresses the “hygienic problem” that often-touched surfaces can accumulate bacteria and other contaminants, which previously required a person to “sequentially [wipe] with a disinfecting solution.” *Id.*, ¶ [0002]. Watanabe also notes that germicidal light was known to be useful for solving this problem, and in prior art, “a germicidal lamp is built into the doorknob itself to sterilize it.” *Id.* Previous solutions were not able to “irradiat[e] over the entirety of portions that come into contact with [a person’s hand], including the rear side of the doorknob... [so] sterilization could be performed only partially.” *Id.*, ¶ [0003].

To solve these problems, Watanabe discloses a device which “is attached so as to surround [a] **doorknob** of an arbitrary door, has an **opening for operation on a front surface** of a **cover** body, and **sterilizes bacteria on the doorknob surface** by **irradiating** the doorknob surface with a **sterilization lamp** inside the cover body. Inside the cover, a **reflecting plate** is provided so as to **irradiate the entire**

³ Ex. 1005 is the original Watanabe reference in Japanese, and Ex. 1006 is the certified English translation.

doorknob.” *Id.*, ¶ [0004] (emphasis added).



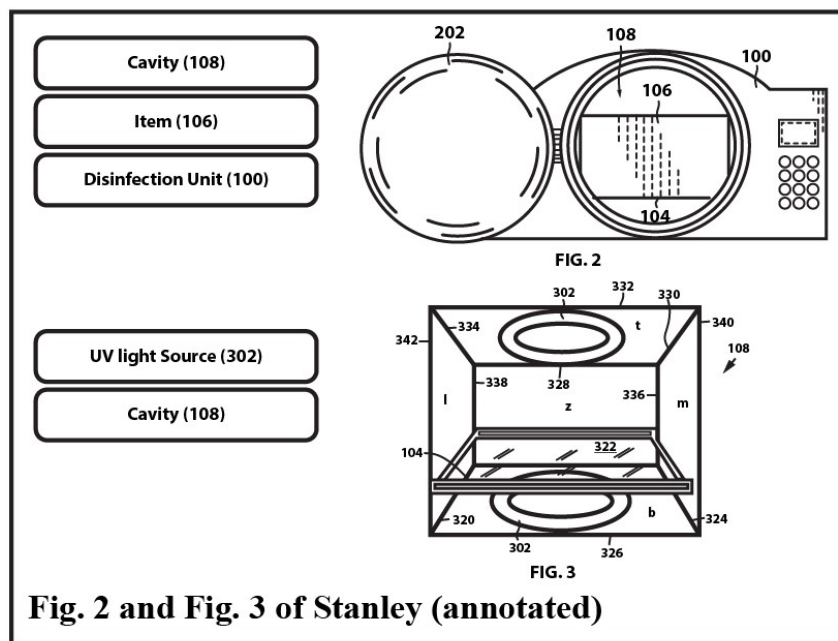
The device housing is made up of first a “base” which has a “**base opening**” which is “**has a size and shape that allow an arbitrary doorknob to pass therethrough**” through it and into the enclosure. *Id.*, ¶ [0005] (emphasis added). The “base” has germicidal lamps mounted to the base, where “various germicidal lamps that have been conventionally used can be employed.” *Id.* The embodiments described in Watanabe use a “**rod shaped sterilization lamp**.” *Id.*, ¶ [0007] (emphasis added). The device also includes “**reflection plate[s]**” which allow for the “irradiation light from the sterilization lamp can be irradiated onto the

doorknob more efficiently.” *Id.*, ¶ [0011] (emphasis added). The device is capable of directing the germicidal light such that it “**irradiate[s] over the entire surface** of the doorknob.” *Id.*, ¶ [0007] (emphasis added).

The enclosure is completed with a “**cover**” which is “**detachably attached** to the base [] so as to cover [the] various components” and has a “**cover opening**” which is “**provided for operating the doorknob.**” *Id.*, ¶ [0005] (emphasis added).

B. Stanley

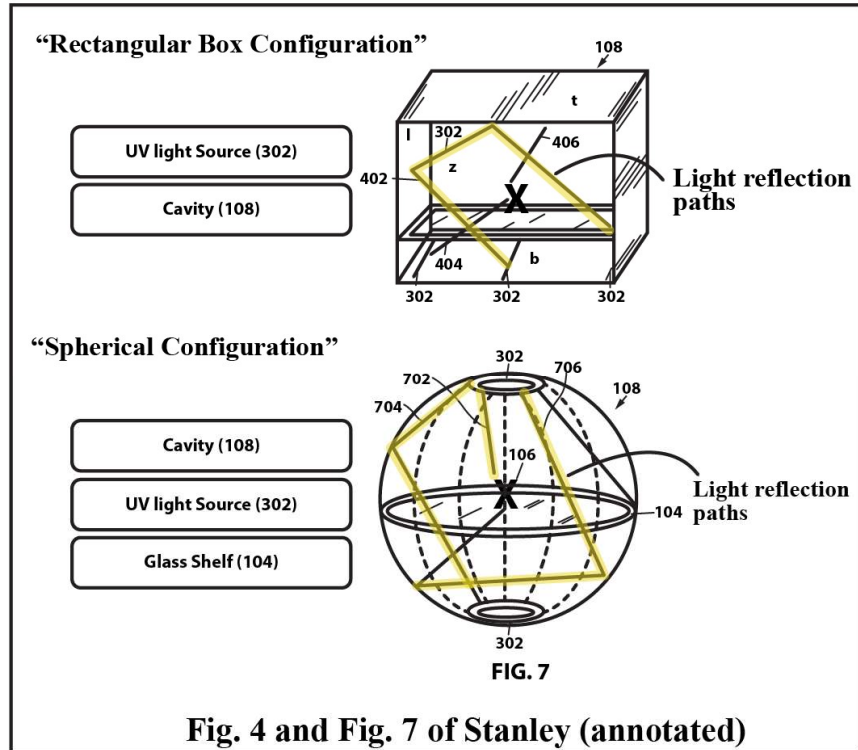
Stanley is a U.S. Patent Application Publication available as prior art under 35 U.S.C. § 102(a)(1) or § 102(a)(2) because it was filed on November 6, 2008, and published on May 6, 2010. Ex. 1007.



Stanley discloses a “unit, system, and method for **disinfecting or sterilizing** the **entire surface** of an item ... include[ing] at **least one ultraviolet light source**... for disinfecting an item... a **reflective interior**,” and “is capable of passing light produced by the at least one ultraviolet light source [] to **disinfect an entire surface** of the item.” Ex. 1007, [Abstract] (emphasis added).

Stanley aims to solve the issue of sickness due to microbe contamination of raw food prior to cooking, for example in transit to the consumer, as well as “utensils, bottles, and everyday items.” *Id.*, ¶ [0002]–[0004].

The “disinfection unit” or “system for sterilizing” includes “at least one ultraviolet light source producing ultraviolet light for disinfecting an item” as well as a “cavity housing the ultraviolet light source, the cavity having a reflective interior for redirecting the ultraviolet light.” *Id.*, ¶ [0006]. Further, the unit includes “a shelf positioned above a bottom portion of the cavity to support the item, the shelf capable of passing light produced by the at least one ultraviolet light source therethrough to disinfect an entire surface of the item.” *Id.*



Because the cavity, or “chamber,” has an entirely reflective surface, and the internal shelf supporting the item is transparent to ultraviolet light, “[l]ight not only strikes the item directly, but can pass through the transparent [shelf] and strike the item. Furthermore, the reflective walls of the chamber redirect any ultraviolet light onto the item, thus disinfecting or sterilizing the entire surface area.” *Id.*, ¶ [0018].

Although the Stanley system is disclosed as fully functional with only one ultraviolet light source, the specification repeatedly refers to “ultraviolet light **sources**.” *Id.* (emphasis added). The figures likewise show multiple embodiments of the unit or system that utilize two ultraviolet light sources. *Id.*, Figs. 3, 6, 7.

The housing of the Stanley unit is described as being made up of walls where “[e]ach wall is planar **and coupled to at least another wall** with the exception of the wall connected to [the] door,” which provides access into the sterilizing chamber. *Id.*, ¶ [0035]. The unit is contemplated as being configurable in multiple shapes, including a “rectangular box configuration” as well as “a **bubble top**... or any other shape.” *Id.*, ¶ [0025]. A “**spherical configuration**” is also contemplated as depicted in Figure 5. *Id.*, ¶ [0052], Fig. 5.

C. Motivation to Combine

A POSITA would have been motivated to combine Watanabe and Stanley to create a device for sanitizing point-of-contact surfaces with an improved housing. Ex. 1003, ¶ 85. Both references are directed to UV-based sanitization systems and address the same fundamental technical problem—how to reliably expose contaminated objects or surfaces to germicidal radiation while allowing for continued human use of the object or surface. *Id.*; *see generally* Ex. 1006; *see generally* Ex. 1007. Watanabe solves this problem for a certain objects—e.g., doorknobs and door handles—and designs its apparatus according to this use case. Ex. 1006, ¶ [Abstract]–[0002]. Stanley solves this problem for objects, such as food items, utensils, bottles, and everyday items, and designs its apparatus to ensure that the entire surface of the object is irradiated with the germicidal UV light. Ex. 1007, ¶ [Abstract], [0001]–[0004]. A POSITA would be motivated to

combine the sterilization efficacy improvements of the Stanley apparatus to a Watanabe-style point-of-contact sterilization apparatus. Ex. 1003, ¶ 86.

1. Motivation to Combine Watanabe and Stanley

Both Watanabe and Stanley address sanitization of objects using UV light and therefore fall squarely within the same technical field of UV-based object and surface sterilization devices. *See* Sections VI.A–B, *supra*. Each reference is directed to improving the effectiveness of UV irradiation through structural and optical design choices, including housing geometry, placement of UV light sources, and the use of reflective interior surfaces. *Id.* Although the references differ in expressly disclosed form factors, their fundamental purpose—maximizing germicidal UV exposure to a target object—is the same. *Id.*

Watanabe provides a solution tailored to point-of-contact surfaces, such as doorknobs, by surrounding the object with an enclosure that contains germicidal UV light sources while still allowing users to access and operate the object. Ex. 1006 ¶[Abstract], ¶[Means for Solving]. This configuration addresses the practical problem of repeated human contact, ensuring that the surface can be sanitized frequently without removing the object from service. *Id.* ¶[0002]–[0003].

Stanley focuses on improving the uniformity and efficacy of UV exposure within a sanitizing enclosure by using an integral housing, multiple UV light sources, curved or spherical interior cavity shapes, and UV-reflective interior

surfaces that redirect germicidal light toward the object from multiple angles. Ex. 1007, ¶[0001], [0018], [0052], Cl. 5. Stanley expressly teaches that reflective and curved interior geometries are easily implementable in embodiments of the claimed device and can improve irradiation coverage and reduce or eliminate shadowing, thereby increasing sanitization effectiveness. *Id.*

A POSITA therefore would have been motivated to combine Watanabe and Stanley not merely because the references are compatible, but because doing so directly addresses known technical considerations in UV sterilization—namely, non-uniform exposure, shadowed regions, and inefficient light distribution within an enclosure. Ex. 1003, ¶ 86–94. Watanabe itself recognizes the importance of irradiating the entire doorknob surface, and Stanley provides well-established structural and optical solutions for achieving precisely that goal. *Id.* Incorporating Stanley’s housing and light-distribution teachings into Watanabe’s point-of-contact apparatus would therefore represent a logical and technically motivated design choice.

The combination would have been readily implementable using routine skill, would not have required undue experimentation or further research, and would have predictably resulted in a UV sterilizing apparatus that sanitizes points of contact as taught by Watanabe while incorporating the functional advantages of the Stanley apparatus’s housing. Ex. 1003, ¶ 92. A POSITA would have readily

recognized that these teachings are complementary rather than conflicting—
Watanabe provides a form factor optimized for sanitizing fixed point-of-contact objects, while Stanley provides well-known optical and structural techniques for improving UV light distribution within a housing. *Id.* Combining these teachings would have required only routine mechanical and optical design choices and would have predictably yielded a point-of-contact sanitizing apparatus with the functional advantages of Stanley’s housing design applied to Watanabe’s use case. *Id.*

The core sterilizing mechanism in both Watanabe and Stanley is the same—germicidal UV light sources emitting radiation capable of inactivating microorganisms. Ex. 1003, ¶ 93. Any differences between the references lie not in the underlying technology, but in the structural configuration used to deliver that technology. *Id.* Accordingly, a POSITA implementing Watanabe’s apparatus would have found it beneficial and straightforward to incorporate Stanley’s housing features, such as curved interior walls and reflective surfaces, to achieve more uniform and effective sterilization coverage of the point-of-contact surface. *Id.*

Conversely, a POSITA implementing Stanley’s design would have been able, without undue effort or redesign, to adapt the housing to mount around a fixed point-of-contact surface as taught by Watanabe, thereby converting a

chamber-based sanitizer into a device that repeatedly sanitizes a frequently touched object. Ex. 1003, ¶ 94.

2. The Combination Would Yield Predictable Results

The combination of Watanabe and Stanley represents a predictable and complementary integration of well-known UV sanitization technologies. Ex. 1003, ¶ 95. Watanabe discloses an apparatus specifically designed to sanitize point-of-contact surfaces, while Stanley discloses housing structures that are known to improve the efficiency and coverage of germicidal UV light. *See* Sections VI.A–B, *supra*.

To the extent that Watanabe does not expressly disclose “integral” housing features, as claimed in the ’061 Patent, with fully reflective or curved interior surfaces, Stanley provides precisely those features and explains their advantages in the context of UV sterilization. Ex. 1003, ¶ 96; Ex. 1006, ¶[0035]. Applying Stanley’s housing concepts to Watanabe’s apparatus would have predictably increased UV exposure of the doorknob surface, reduced shadowed regions, and improved overall sanitization effectiveness. Ex. 1003, ¶ 96.

A POSITA would have viewed this combination as routine optimization—using each reference’s established elements to address well-known limitations in UV exposure and enclosure design—to achieve an apparatus that effectively sanitizes point-of-contact surfaces while still allowing users to access and operate

them. Ex. 1003, ¶ 97. The expected results of the combination follow directly from the teachings of the references and do not depend on any unexpected properties or unconventional interactions. *Id.*

3. Stanley is Analogous Art to Watanabe Within a Crowded and Predictable Technological Field

Stanley is analogous art to Watanabe because it falls within the same field of endeavor, UV-based sanitization of objects, and is directed to the same fundamental technical problem addressed by the '061 Patent—reducing contamination on frequently contacted objects using germicidal ultraviolet light. Ex. 1003, ¶ 98–99. A POSITA tasked with improving a UV-based point-of-contact sanitizing device would have logically looked to Stanley when considering how to improve housing geometry, light distribution, and irradiation uniformity within a sanitizing enclosure. *Id.*

While Stanley's exemplary embodiments concern the sterilization of food or other objects placed within a chamber, the reference makes clear that germicidal UV light is applicable to sterilization generally and is not limited to food-related applications. Ex. 1007. ¶[0002], [0006], [0018], [0022]. The underlying functionality of Stanley—using UV light and reflective housing structures to sanitize an object—is therefore substantially the same as that of Watanabe,

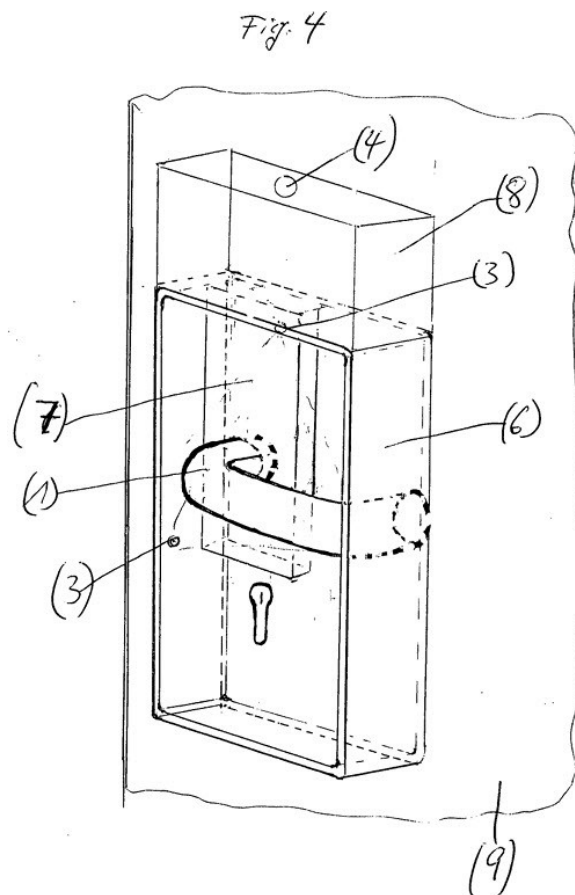
differing only in the form factor and class of objects being sanitized. Ex. 1003, ¶ 100.

Watanabe similarly relies on the same natural phenomenon and technology—UV light sources emitting germicidal radiation—but applies it to doorknobs and other frequently touched surfaces. *Id.*, ¶ 100; Ex. 1006, ¶ [Abstract]–[0002]. A POSITA would understand the differences in application and structural configuration between Watanabe and Stanley would be viewed as superficial and would not detract from their relevance to one another. *Id.* Both references address how housing structure, internal surfaces, and light placement affect UV exposure and sanitization effectiveness, and both seek to maximize irradiation of the target object. *See* Sections VI.A–B, *supra*.

Both references solve essentially the same problem using the same technology, and the structural features disclosed in Stanley—such as spherical or curved interior cavity shapes and UV-reflective interior surfaces—are directly transferable to Watanabe’s point-of-contact sanitizing apparatus. *Id.*, ¶ 101. A POSITA would therefore have regarded Stanley as analogous art and a logical reference to combine with Watanabe when developing a UV-based point-of-contact sanitizing device. *Id.*

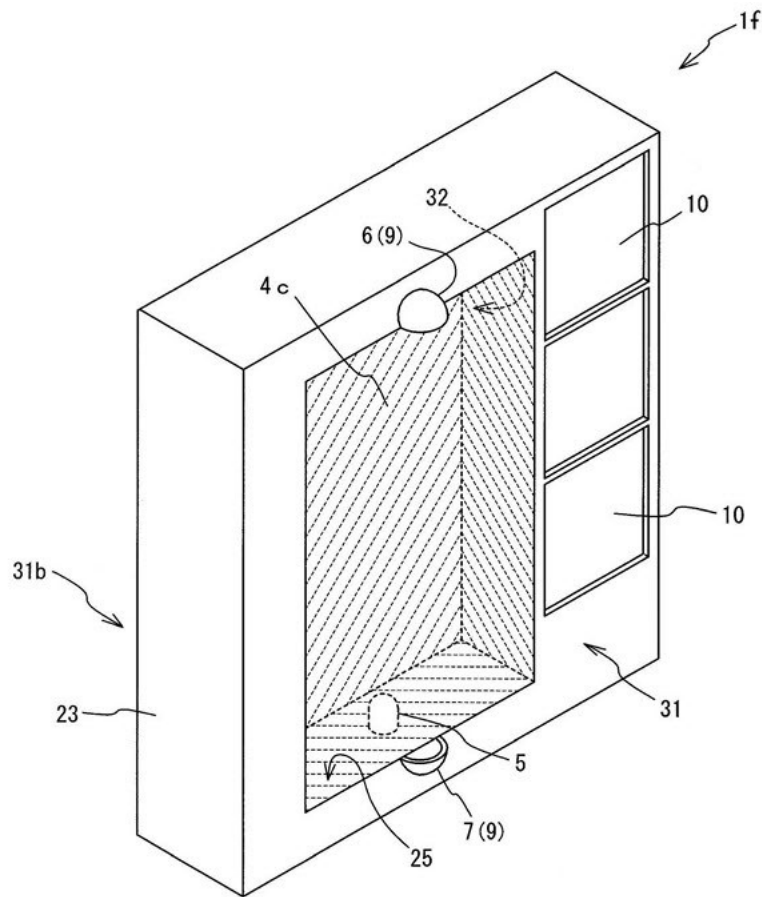
This conclusion is further reinforced by the crowded and predictable nature of the technical field, which includes numerous prior art references addressing the

sanitization of door hardware and other frequently touched surfaces. For example, German Utility Model 202004017284 (“Kuschel”), published on September 24, 2010, discloses an apparatus that engulfs a doorhandle, mounts to a door, and sanitizes the handle using an antibacterial agent. Ex. 1003, ¶ 102. Kuschel addresses the same problem as Watanabe—reducing germ transmission from door hardware—differing primarily in its choice of sanitizing agent rather than in the overall approach. *Id.*



Id. at Fig. 4 (depicting the sanitizing housing (6) surrounding the door handle (1)).

Similarly, Japanese Patent Application Publication 2010209513 (“Shirai”), published on September 24, 2010, discloses a doorhandle capable of sanitizing itself using a built-in germicidal light source. Ex. 1003, ¶ 103. Shirai solves the same problem as Watanabe by relying on germicidal light, but integrates the sanitizing mechanism directly into the doorhandle rather than using a surrounding enclosure. *Id.*



Id. at Fig. 12 (depicting a perspective view of the sanitizing door handle).

Together, these references demonstrate that the use of germicidal energy, reflective structures, and dedicated housings or integrated components to sanitize

frequently touched objects was well known and widely explored. In this context, Stanley and Watanabe represent closely related solutions within the same technical field, making Stanley a natural and appropriate analogous reference for evaluating and improving Watanabe's point-of-contact sanitizing apparatus.

VII. SPECIFIC GROUNDS FOR PETITION

Pursuant to Rule 42.204(b)(4)-(5), the following sections (as supported by the Declaration of Dr. Michael Lebby (Ex. 1003)) detail grounds of unpatentability for Claims 1–20 of the '061 Patent.

A. **Ground 1: Claims 1–5 and 10, are anticipated by Watanabe under 35 U.S.C. §102**

Watanabe discloses each and every limitation of Claims 1–5 and 10, and therefore anticipates those claims.

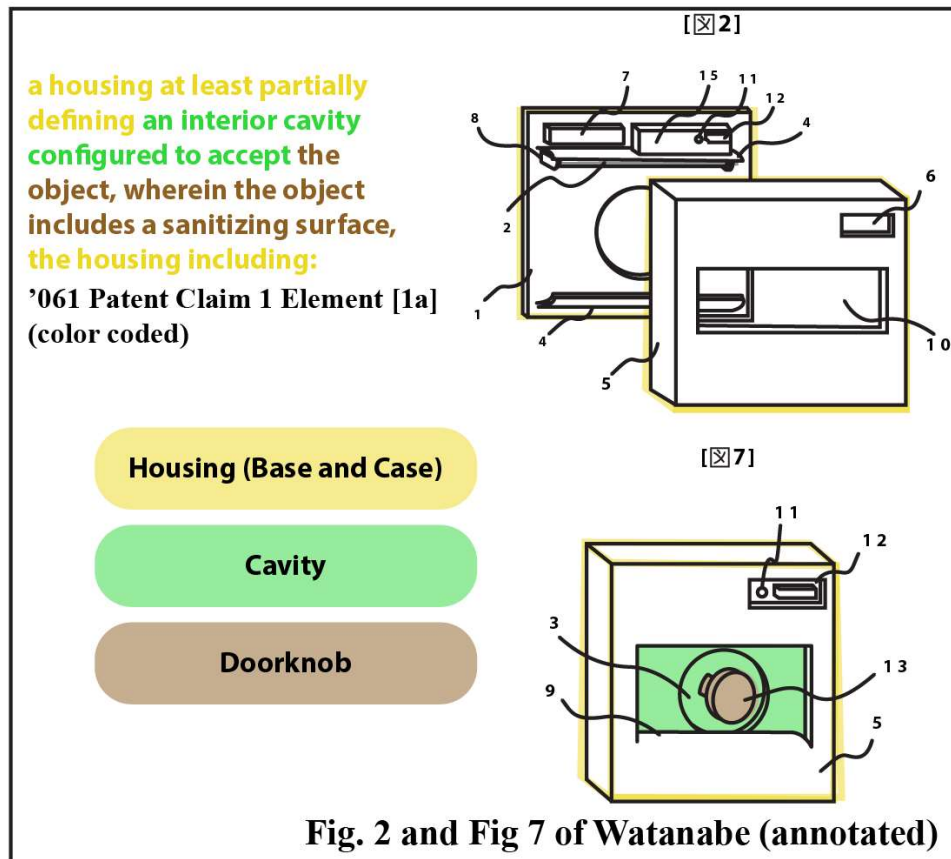
1. **Claim 1**

a. **Element [1pre]: “An apparatus for sanitizing an object, the apparatus comprising:”**

To the extent the preamble is limiting, Watanabe discloses an apparatus for sanitizing an object. Ex. 1006, ¶ [0001]. Watanabe states that the “invention relates to a **sterilization device** for a doorknob.” *Id.* (emphasis added). A doorknob being an object, Watanabe discloses this subject matter. Ex. 1003, ¶¶ 108–109.

- b. **Element [1a]: “a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including;”**

Watanabe discloses this limitation because it explicitly discloses a housing that defines an interior cavity that is configured to accept the object to be sanitized, wherein the object has a surface to be sanitized. Ex. 1003, ¶¶110–111.



Watanabe teaches a “base” that has a “base opening” which is “has a size and shape that allow an arbitrary doorknob to pass therethrough” through it and into the enclosure. Ex. 1006, ¶ [0005]. “A cover [] is detachably attached to the

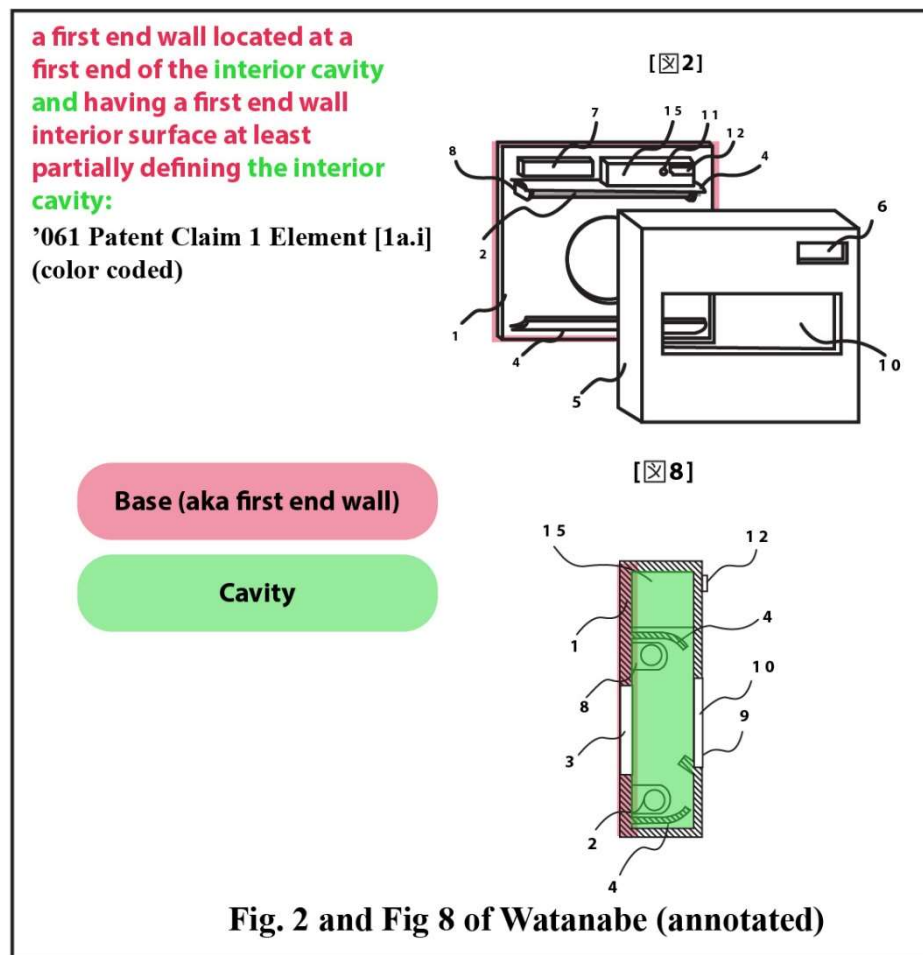
base [] so as to cover [the] components” and a “cover opening [] provided for operating the doorknob. This cover opening [] has a size and shape such that hands or arms do not come into contact with the cover within a range allowing for the manual operation of the doorknob.” Ex. 1006, ¶ [0005]. The cover is attached to the base. *Id.*

Watanabe therefore explicitly discloses a housing that is “configured to accept” an object to be sanitized. Ex. 1003, ¶ 113. The language used by Watanabe to define its housing includes an interior cavity, and explicitly shows such a cavity in its Figures. Ex. 1006, ¶[0007], Figs. 2–4, 7, 8; Ex. 1003, ¶¶ 111–112.

To the extent that an interior cavity is not explicitly disclosed in the language or figures of Watanabe, a POSITA would understand that the housing described must inherently have an interior cavity such that an object, like a doorknob, is enclosed by the housing with enough empty space remaining for a person to touch or operate it, as expressly disclosed in Watanabe. Ex. 1003, ¶¶ 114–115.

- c. **Element [1a.i]: “a first end wall located at a first end of the interior cavity and having a first end wall interior surface at least partially defining the interior cavity;”**

Watanabe discloses this limitation because it explicitly discloses a first end wall located at a first end of an interior cavity that at least partially defines the interior cavity. Ex. 1003, ¶¶ 116–117.

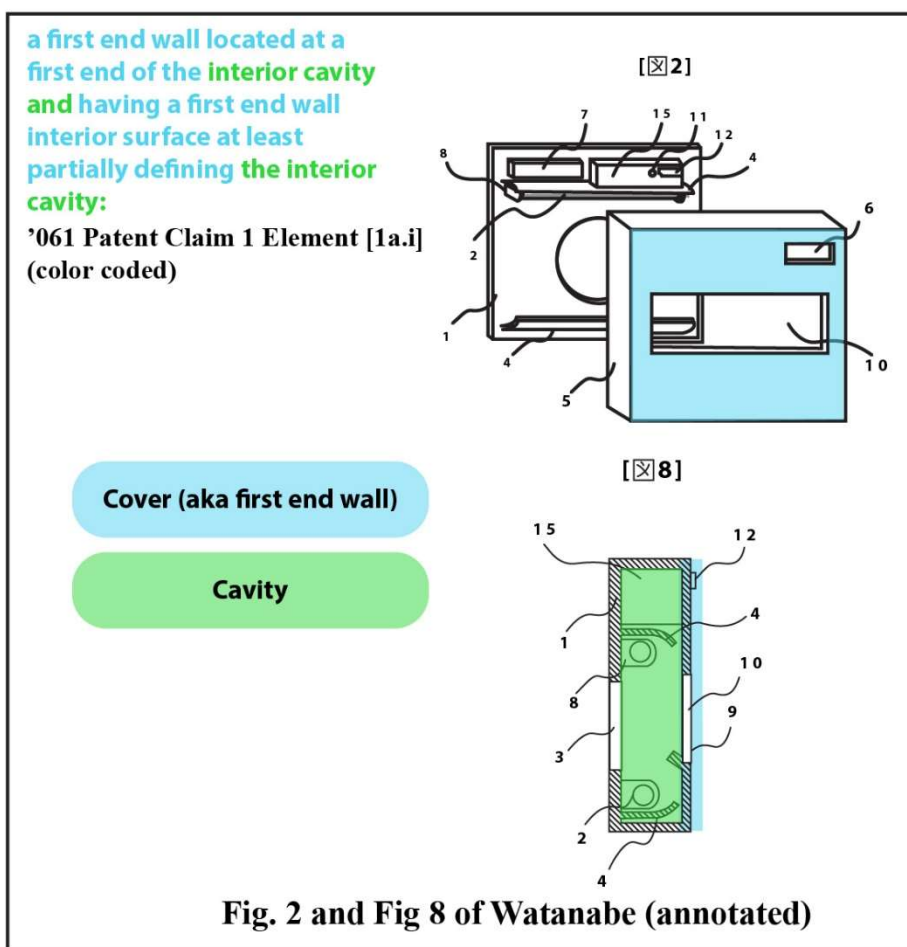


Watanabe discloses a “base” that is “fixed to the door” which has the doorknob to be sterilized. Ex. 1006, ¶ [0005]. Figures 2 and 8 show this “base,”

and how in conjunction with a “cover” that “is detachably attached to the base” the “base” and “cover” thereby create an internal cavity. *Id.*, ¶ [0005], Figs. 2, 8.

Watanabe explicitly discloses that the “base” is part of the housing of the invention. *Id.*, ¶ [0005]. The language used by Watanabe to define the invention’s housing inherently includes an interior cavity as shown explicitly in Figures 2 and 8. *Id.*, Figs. 2, 8. Therefore, the “base” of Watanabe has a surface which at least partially defines the interior cavity. Ex. 1003, ¶¶ 118–119.

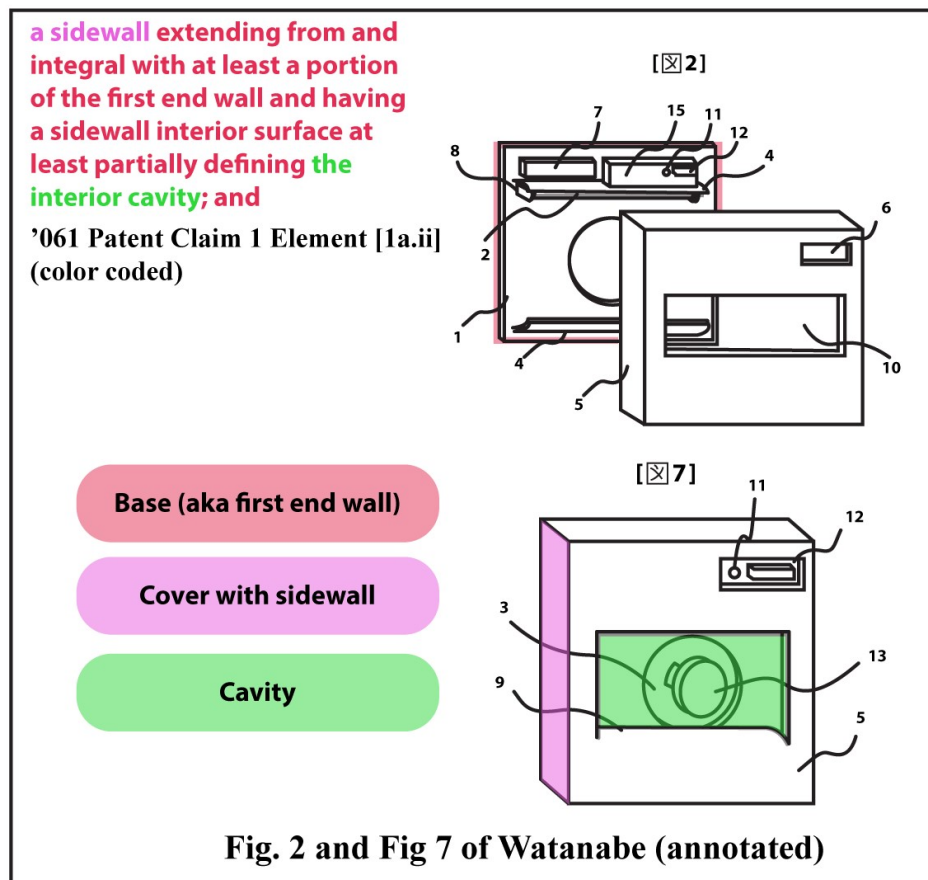
A POSITA would understand “first end wall” to be a generic term referring simply to one “wall” or side of the apparatus housing, and serves as a reference point for defining the remainder of the housing structure. *Id.* at ¶ 120. Therefore, although the language of Element [1a.i] uses the term “first end wall,” a POSITA would understand that this is either analogous to the “base” of Watanabe or equally to the side of the “cover” which is opposite the “base.” *Id.*



The alternative correlation between the claimed “first end wall” and Watanabe’s “cover” (i.e., as an alternative to the correlation between the “first end wall” and Watanabe’s “base”) is shown in annotated Figures 2 and 8, above. In either case, Watanabe discloses this limitation. Ex. 1003, ¶¶ 120–121.

- d. **Element [1a.ii]: “a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and”**

Watanabe discloses this limitation because it explicitly discloses a sidewall that extends from and is integral with at least a portion of the first end wall and has a surface at least partially defining the interior cavity. Ex. 1003, ¶¶ 122–123.



Watanabe teaches a “cover” that is “detachably attached to the base... so as to cover [the] components.” Ex. 1006, ¶ [0005]. As discussed for Element [1a.i],

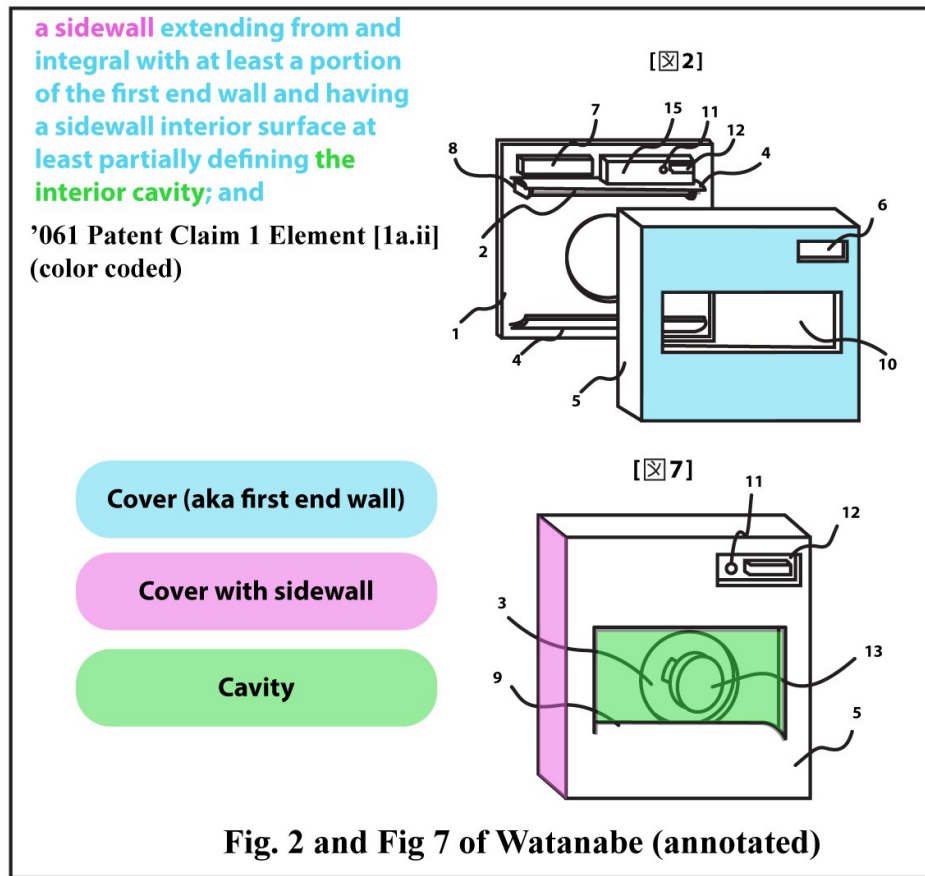
the “base” of Watanabe is analogous to the “first end wall.” Ex. 1003, ¶ 124.

Figures 2 and 7 of Watanabe show the “cover” as a rectangular box with one side missing or open, such that when the “cover” is “attached” to the “base” they together form an interior cavity. Ex. 1006, ¶ [0005], Figs. 2, 7. The “cover,” as shown in the Figures, includes a sidewall (highlighted above in pink). *Id.*

Therefore, Watanabe explicitly discloses a sidewall that at least partially defines the interior cavity and is “integral” with the first wall when the cover and base are coupled together, within the meaning of the term “integral” as used in the ’061 Patent. Ex. 1003, ¶ 124.

To the extent that the term “integral” as used in the ’061 Patent excludes housing elements that are detachably attachable, and requires that the “sidewall” and “first end wall” be part of the same structure (e.g., manufactured as a single piece), Watanabe nonetheless discloses this limitation. *Id.* at 125–128.

As used in the ’061 Patent, a POSITA would understand the terms “first end wall” or “second end wall” to be generic terms referring simply to one “wall” or side of the apparatus housing, where “first” and “second” serve as reference points for defining the relationship between two distinct “walls.” *Id.* at ¶ 127. Therefore, a POSITA would understand that the “first end wall” to be equally analogous to either the “base” or the side of the “cover” opposite the base. *Id.*

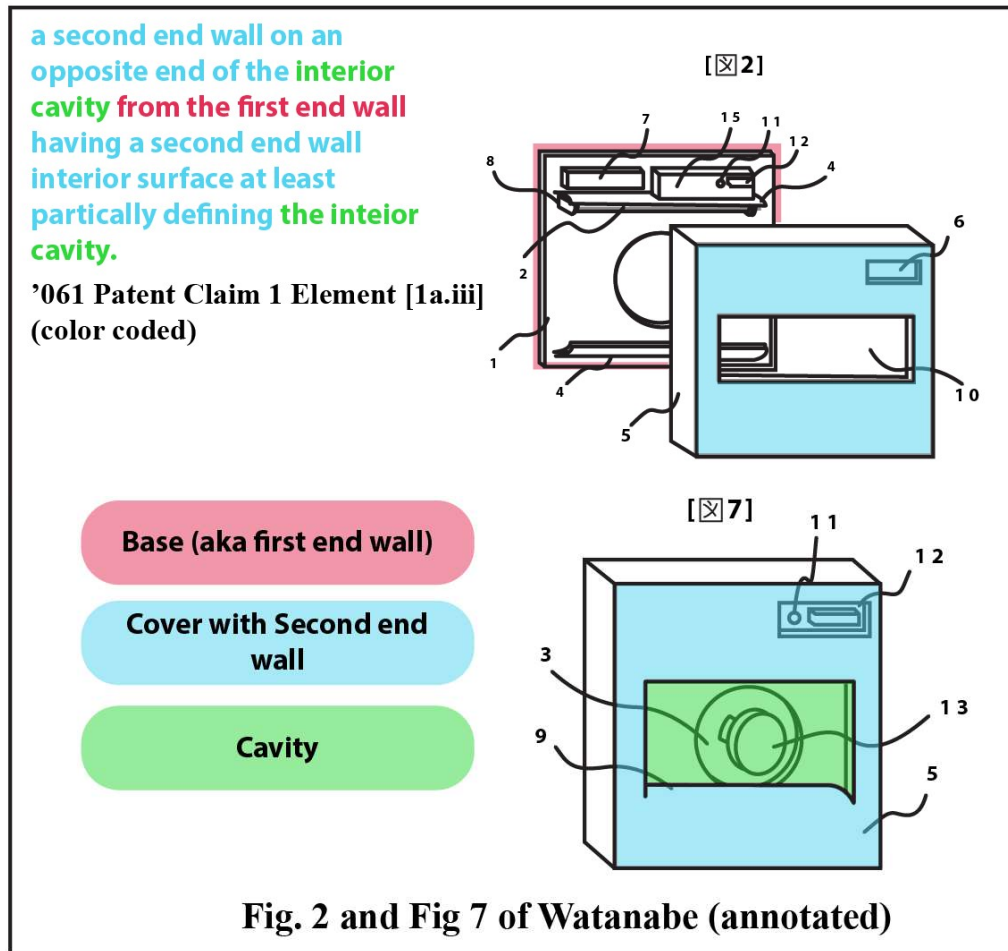


The alternative correlation between the claimed “first end wall” and Watanabe’s “cover” (i.e., as an alternative to the correlation between the “first end wall” and Watanabe’s “base”) is shown in annotated Figures 2 and 7, above. Starting with the “cover” as a reference point, Watanabe discloses a “first end wall” with at least one “sidewall” that are together manufactured as a single piece, where the sidewall extends perpendicularly away from the “cover” face. *Id.* at ¶ 128; Ex. 1006, ¶ [0005], Figs. 2, 7. Therefore, in either mapping of the “first end

wall” to one of the analogous sides of the Watanabe housing, Watanabe discloses this limitation. Ex. 1003, ¶¶ 128–129.

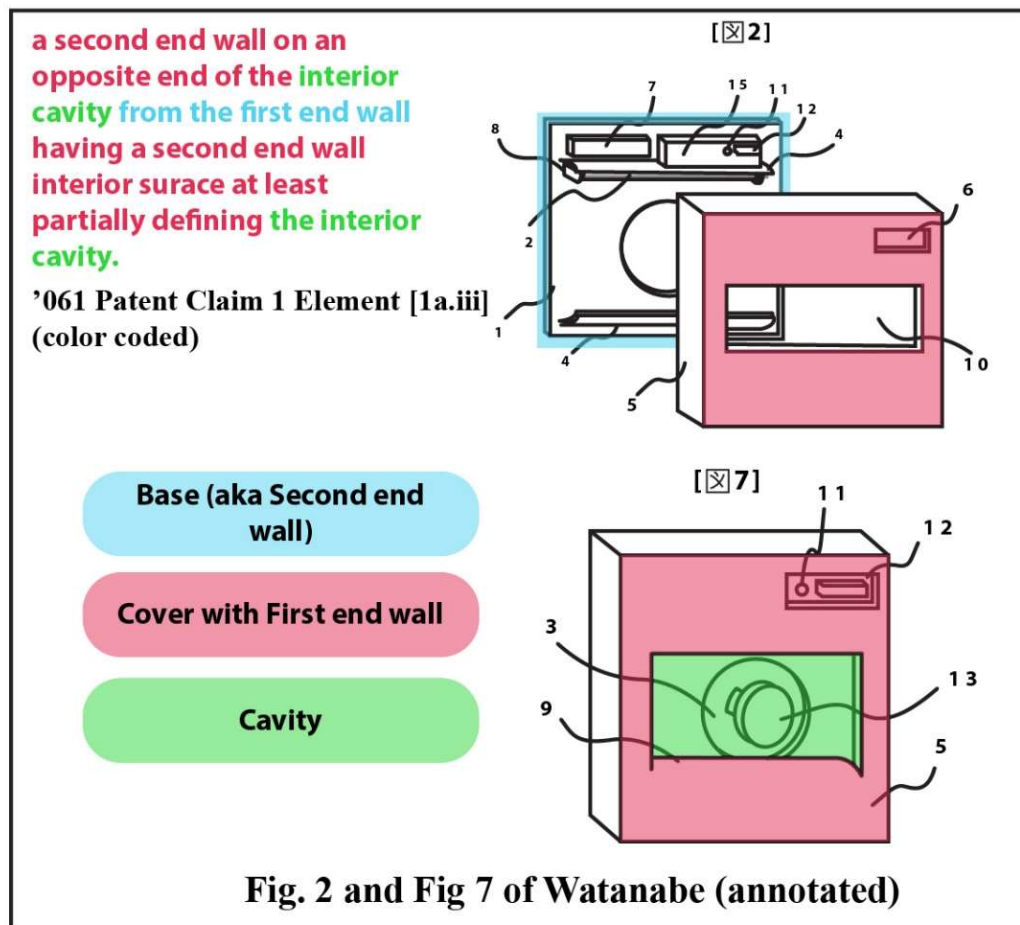
- e. **Element [1a.iii]: “a second end wall on an opposite end of the interior cavity from the first end wall having a second end wall interior surface at least partially defining the interior cavity,”**

Watanabe discloses this limitation because it explicitly discloses a second end wall on the opposite end of the interior cavity from the first end wall, where the second end wall has an interior surface which at least partially defines the interior cavity. Ex. 1003, ¶¶ 130–131.



Watanabe explicitly discloses a “cover” that is “detachably attached to the base” and Figures 2 and 7 show that the “cover” has a side which, when attached to the base to form a box-shaped enclosure, is parallel and opposite to the “base.” Ex. 1006, ¶ [0005], Figs. 2, 7. As discussed previously, the housing of Watanabe, the combination of a “base” and “cover,” inherently creates an interior cavity. See Sections VII.A.1.a-d, *supra*.

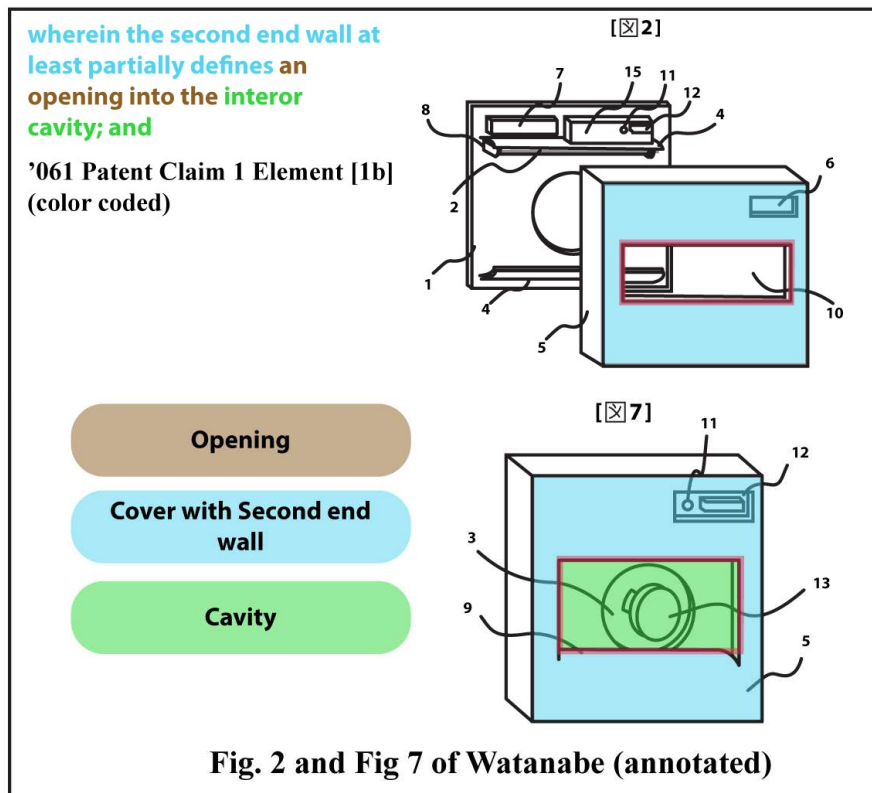
A POSITA would understand “second end wall” to be a generic term referring simply to one “wall” or side of the apparatus housing, and serves as a reference point for defining the remainder of the housing structure. *Id.* at 133. Therefore, although the language of Element [1a.iii] uses the term “second end wall,” a POSITA would understand that this is either analogous to the “base” of Watanabe or equally to the side of the “cover,” which is opposite the “base.” *Id.*



The alternative correlation between the claimed “first end wall” and Watanabe’s “cover” (i.e., as an alternative to the correlation between the “first end wall” and Watanabe’s “base”) is shown in annotated Figures 2 and 7, above. In either mapping, Watanabe discloses this limitation. *Id.* at 133–134.

f. Element [1b]: “wherein the second end wall at least partially defines an opening into the interior cavity; and”

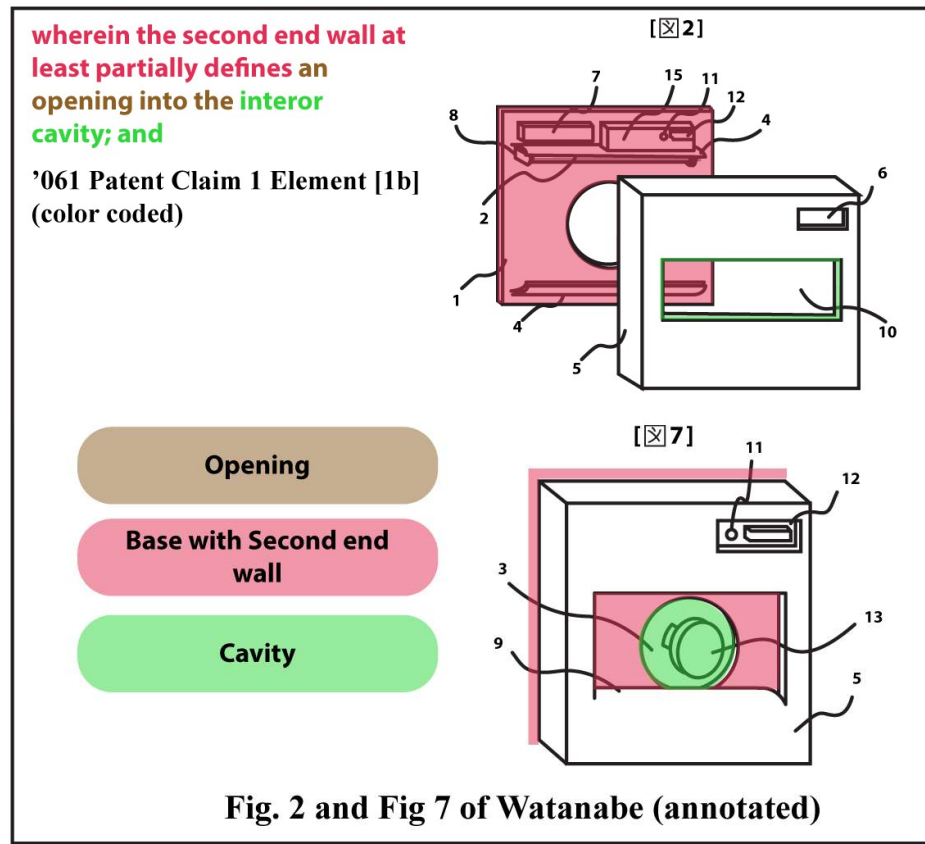
Watanabe discloses this limitation because it explicitly discloses an opening in the second end wall of its housing which at least partially defines an opening into the interior cavity. Ex. 1003, ¶¶ 135–136.



Watanabe teaches a “cover opening” which is “provided for operating the doorknob. Ex. 1003, ¶ 137. This cover opening [] has a size and shape such that hands or arms do not come into contact with the cover within a range allowing for the manual operation of the doorknob.” Ex. 1006, ¶ [0005]. Further, Figures 2 and 7 show said “cover opening.” Ex. 1006, ¶ [0005], Figs. 2, 7.

Watanabe also discloses a “base opening” which similarly defines an opening into the interior cavity. *See* Sections VII.A.1.b, *supra*.

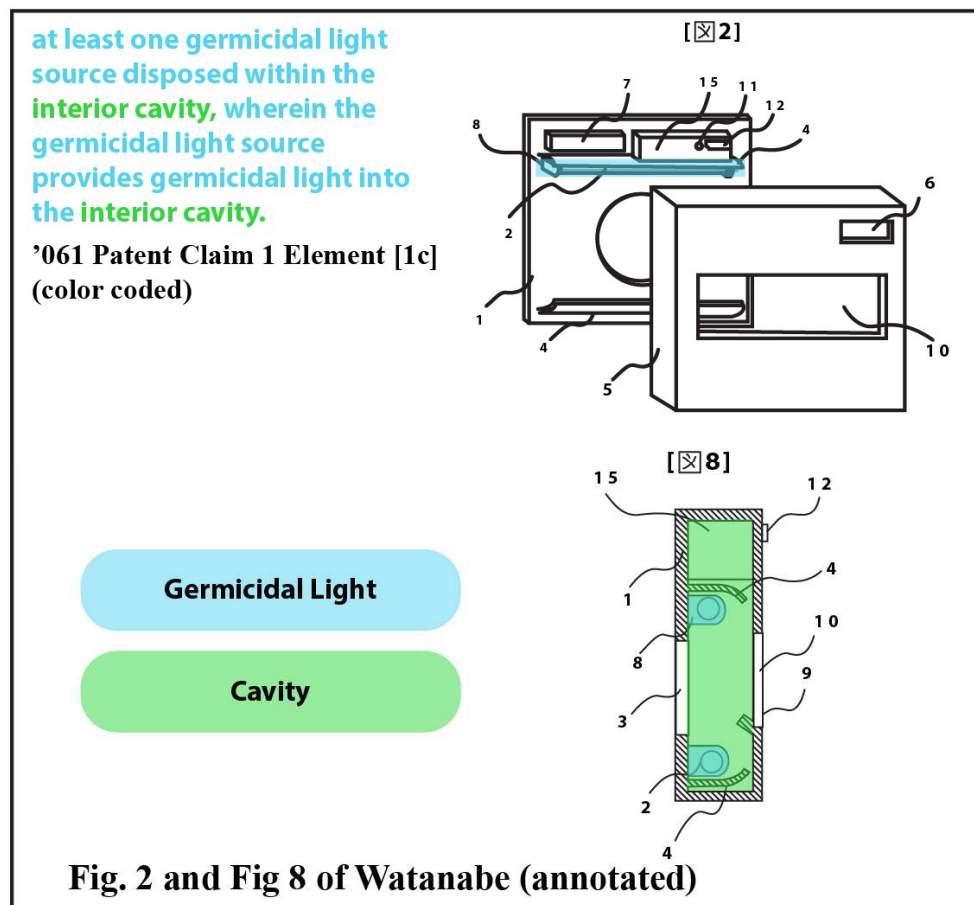
The “interior cavity” is inherently if not explicitly disclosed based on the language and Figures of Watanabe. *See* Sections VII.A.1.a-d, *supra*.



As discussed previously, the terms “first end wall” and “second end wall” as used in the '061 Patent are generic terms serving as reference points. *See* Sections VII.A.1.c–e, *supra*. Therefore, if “second end wall” is applied to reference the “base” or the side of the “cover” opposite the base, this limitation is equally disclosed by Watanabe because both the “base” and “cover” of Watanabe define openings into the interior cavity of the apparatus. Ex. 1003, ¶¶ 141–142.

- g. **Element [1c]: “at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity.”**

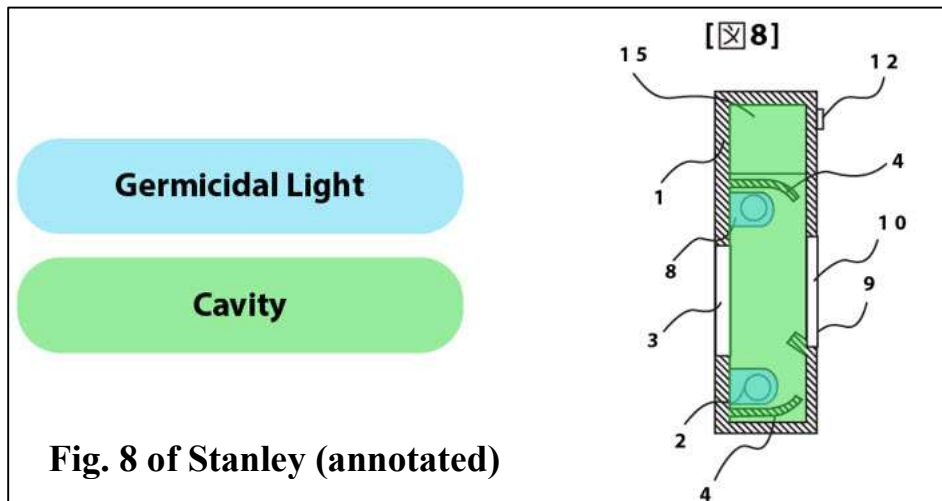
Watanabe discloses this limitation explicitly because it discloses at least one germicidal light source disposed within the interior cavity such that the germicidal light source provides germicidal light into the interior cavity. Ex. 1003, ¶¶ 143–144.



Watanabe teaches “a germicidal lamp [that] irradiates the surface of the doorknob inside the cover body.” Ex. 1006, ¶ [0004]; Ex. 1003, ¶ 144. “A germicidal lamp [] is detachably mounted on the germicidal lamp mounting portion above the base opening” and “the germicidal lamp [] emits light with electric power.” *Id.* Further, Figure 8 shows two germicidal light sources attached to the “base” of the housing. Ex. 1006, Fig 8.

2. Claim 2: “The apparatus of claim 1, wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.”

Watanabe discloses this limitation because it discloses an apparatus with two germicidal light sources where the two light sources are opposite each other in the internal cavity. Ex. 1003, ¶ 147–149. Watanabe depicts two germicidal light sources, inside the interior cavity of the housing, which are on opposite sides of the “base opening.” Ex. 1006, Fig. 8.



3. **Claim 3:** “The apparatus of claim 2, wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.”

Watanabe discloses this limitation. Ex. 1003, ¶ 150–151. Watanabe discloses two germicidal light sources within the apparatus housing. Ex. 1006, ¶ [0005], Figs. 2, 8; *see* Sections VII.A.1.g, VII.A.2, *supra*. Watanabe discloses that these germicidal light sources protrude outward into the interior cavity and project light throughout the interior cavity in that they are mounted within the interior cavity and “provide[] germicidal light into the interior cavity” by emitting UV light. *See* Section VII.A.1.g, *supra*; Ex. 1003, ¶ 152.

A POSITA would understand that because the germicidal light sources in Watanabe “project” UV light into the interior cavity, that light necessarily propagates throughout the enclosed volume and impinges upon the interior-facing surfaces of the housing, including the sidewall interior surfaces. Ex. 1003, ¶ 153.

As a matter of basic optics and material science, a POSITA would understand that the materials forming the housing sidewalls necessarily exhibit at least some degree of reflectivity with respect to the emitted UV radiation. Ex. 1003, ¶ 154. Accordingly, when UV light emitted by the germicidal light sources strikes the sidewall interior surfaces, a portion of that light is necessarily reflected off the sidewall and projects back into the interior cavity. *Id.* Thus, Watanabe discloses this limitation. Ex. 1003, ¶ 155.

4. Claim 4: “The apparatus of claim 2, wherein at least one of the first germicidal light source or the second germicidal light source are cylindrical light sources.”

Watanabe discloses this limitation because it discloses the use of cylindrical light sources. Ex. 1003, ¶¶ 156–157. Watanabe teaches the application of “various germicidal lamps.” Ex. 1006, ¶ [0005]. For example, “a rod-shaped germicidal lamp,” which is employed in the embodiments is shown in the Figures. Ex. 1006, ¶ [0005], Fig. 8.

Additionally, POSITA would know that cylindrical or rod-shapes are conventional for germicidal light sources, specifically UV light, and would see that the use of such lights are disclosed explicitly by Watanabe. Ex. 1003, ¶ 158; Ex. 1006, ¶ [0005], Fig. 8. Thus, Watanabe discloses this limitation. Ex. 1003, ¶ 159.

5. Claim 5: “The apparatus of claim 1, wherein the at least one germicidal light source forms a projection into the interior cavity and is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”

Watanabe discloses this limitation. Ex. 1003, ¶ 160–161. Watanabe teaches the application of “various germicidal lamps.” Ex. 1006, ¶ [0005]. A POSITA would have been familiar with conventional forms of germicidal UV light sources and would have been capable of selecting from among known light source types having different emission angles or fields of illumination. Ex. 1003, ¶ 161. For example, a light source may include a fish-eye lens configured to distribute light over a field of view greater than 180 degrees. Ex. 1003, ¶ 162. A POSITA would have understood that fish-eye lenses are wavelength-agnostic optical components and could be readily adapted for use with UV or other germicidal wavelengths. *Id* (referencing, e.g., Ex. 1012 at Abstract (“A fisheye lens whose angle of field is as wide as 220.”); Ex. 1013 at 1:21–24 (“[F]ish-eye objective lens [have] a constant field angle relative to its optical axis and preferably offering a Solid image capture angle of at least 2π steradians (i.e. a field angle of at least 180°)[.]”); Ex. 1014).

Additionally, Figures 4 and 8 of Watanabe disclose “rod-shaped” germicidal light sources that are mounted to the “base” such that they protrude outward into the interior cavity. Ex. 1006, ¶ [0005], Figs. 4, 8. A POSITA would understand

that this necessarily results in emission of germicidal light in a field greater than 180 degrees into the interior cavity because “rod-shaped” light sources emit light in 360 degrees, as a function of their shape. Ex. 1003, ¶ 163. Further, a POSITA would understand that the light mounting design shown in Watanabe would not result in a blocking of the light’s emission field such that it no longer directs in a field of view greater than 180 degrees. *Id.*

Moreover, Claim 5 employs both the terms “direct” and “projection,” which a POSITA would understand according to their plain and ordinary meaning. *Id.*, ¶164. A POSITA would understand that a light source, by emitting light, necessarily “directs” that light outward along a path or pattern, thereby creating a “projection” of light towards another surface or space. *Id.* Thus, Watanabe discloses this limitation. Ex. 1003, ¶ 165.

6. **Claim 10: “The apparatus of claim 1, wherein the first end wall is a posterior end wall, the second end wall is an anterior end wall, and the sidewall is coupled with the posterior end wall and projects in an anterior direction relative to the posterior end wall.”**

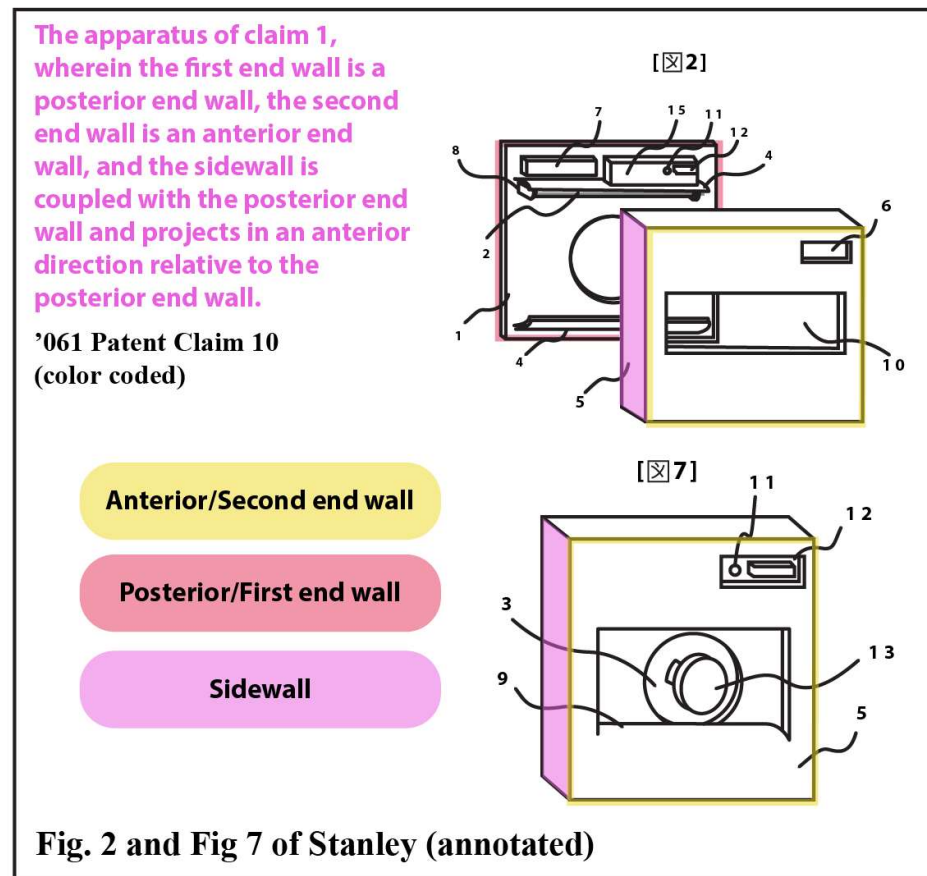
Watanabe discloses this limitation. Ex. 1003, ¶ 166–167. The ’061 Patent’s specification explicitly defines the terms “posterior wall” and “anterior wall,” but fails to define the terms “first end wall” or “second end wall.” Generally, in the specification the term “wall” is used interchangeably to refer to either part of the

housing or to a physical wall (for example in a room). Ex. 1001, 4:3–6, 4:23–26; Ex. 1003, ¶ 168.

As discussed previously, a POSITA would understand the term “wall” to refer generically to a side of the apparatus housing, which can serve as a reference point for defining the remainder of the housing structure. *See* Sections VII.A.1.c–e, *supra*.

As defined by the ‘061 Patent, the term “**posterior**” refers generally to the end of an apparatus or system [] proximate to a point of contact or to a structure to which the point of contact is attached (e.g., a wall or door).” Ex. 1001, 4:2–6. The term “[a]**nterior**” refers generally to the end of the apparatus or system through or by which a human user may access the point of contact, such as by extension of a hand through anterior opening.” Ex. 1001, 4:6–9.

While the specification does not distinguish between a “posterior wall” and “first end wall,” or between an “anterior end wall” and a “second end wall,” Claim 10 expressly draws this distinction by reciting that “**the first end wall is a posterior end wall**, [and that] the **second end wall is an anterior end wall**.” Ex. 1001, 10:23–25. Accordingly, the use of both sets of terms indicates that the “first” and “second” end walls are not inherently defined as posterior or anterior. Ex. 1003, ¶ 170.



Thus, a POSITA would understand Claim 10 to describe a “first end wall” with “posterior” features, meaning it is “proximate to” the object to be sanitized, and a “second end wall” which is opposite the “first end wall” and has “anterior” features, meaning it is designed such that “a human user may access” the object to be sanitized. Ex. 1001, 4:2-9; Ex. 1003, ¶¶ 171–172.

Watanabe discloses a housing with two opposite “end walls” where one is proximate to the object to be sanitized, and the other is designed to allow for human access to the object to be sanitized. Ex. 1006, ¶ [0005], Figs. 2, 7; *see*

Section VII.A.1, *supra*. Watanabe additionally discloses at least one “sidewall” that completes the “cover” of the housing, and extends perpendicular, or “projects” from the “second end wall” and is likewise perpendicular to the “first end wall.” Ex. 1006, ¶ [0005], Figs. 2, 7; Ex. 1003, ¶ 174. Thus, Watanabe discloses this limitation. Ex. 1003, ¶ 175.

B. Ground 2: Watanabe in light of the knowledge of a POSITA renders Claims 1-20 obvious under 35 U.S.C. §103.

As detailed above, Claims 1–5 and 10 are anticipated by Watanabe under 35 U.S.C. §102. *See* Section VII.A, *supra*. To the extent that Watanabe does not anticipate any of these claims because it does not expressly teach each certain aspects of these claims, Watanabe on its own renders these claims, and also Claims 6-9 and 11-20, obvious based on the knowledge of a POSITA. Ex. 1003, ¶ 176.

1. Claim 1.

a. Element [1pre]: “An apparatus for sanitizing an object, the apparatus comprising:”

To the extent the preamble is limiting, and to the extent that Watanabe does not expressly teach this claim, Watanabe renders it obvious in light of the knowledge of a POSITA for the same reasons as in Section VII.A.1.a. Ex. 1003, ¶¶ 177–179. Watanabe discloses an apparatus that “relates to a sterilizer for a doorknob.” Ex. 1006, ¶ [0001]. To the extent Watanabe does not disclose an “apparatus for sanitizing an object” a POSITA would find it obvious that an

apparatus that sterilizes a doorknob could be applied equally to sterilizing other objects. Ex. 1003, ¶ 179.

- b. Element [1a]: “a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including;”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶¶ 180–181.

To the extent that Watanabe does not anticipate these elements, as discussed in Section VII.A.1.b, any differences between the relevant disclosure of Watanabe and Element [1a] would be obvious to a POSITA. Ex. 1003, ¶ 181.

Watanabe teaches a sanitizing apparatus with a “base” and a “cover” where the “cover” has an opening allowing for operation of a doorknob within the apparatus. *See* Section VII.A.1.b, *supra*; Ex. 1003, ¶ 182.

A POSITA would have understood that the Watanabe housing is configured to accept the object to be sanitized, as it is expressly dimensioned to receive a doorknob and permit repeated user access. Ex. 1003, ¶ 183. Further, the base-and-cover housing inherently defines an interior cavity, as it encloses the doorknob and internal components while providing sufficient space for a user’s hand to enter and operate the doorknob. *Id.* at ¶ 184.

To the extent that Watanabe does not explicitly label this space an “interior cavity,” a POSITA would nevertheless recognize that any housing designed to surround a doorknob and allow hand access must inherently and would obviously include such a cavity. Ex. 1003, ¶ 185. Configuring an interior space to accommodate a known object and user interaction would have been a routine and obvious design choice to a POSITA. *Id.* at ¶ 186. Thus, Watanabe discloses this limitation. *Id.* at ¶ 187.

- c. **Element [1a.i]: “a first end wall located at a first end of the interior cavity and having a first end wall interior surface at least partially defining the interior cavity;”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶¶ 188–189.

Watanabe teaches a sanitizing apparatus with a “base” that is mounted proximate to a doorknob to be sanitized, and a “cover” which is detachably attached to the “base.” *See* Section VII.A.1.c, *supra*; Ex. 1003, ¶ 190.

A POSITA would have understood that the base disclosed by Watanabe forms one end of the housing and necessarily includes an interior-facing surface that at least partially defines the interior cavity. *Id.* at ¶ 191. This is inherent in

Watanabe’s housing structure, which encloses the doorknob and sanitizing components, as illustrated in the figures. *Id.*

Although Element [1a.i] uses the term “first end wall,” a POSITA would recognize this as a generic descriptor for a wall or boundary at one end of the housing. *Id.* at ¶ 192. A POSITA would therefore have found it obvious that either of Watanabe’s “base” or the side of the “cover” opposite the base corresponds to the claimed “first end wall” and includes an interior surface that partially defines the interior cavity. *Id.*

d. Element [1a.ii]: “a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 194.

Watanabe teaches a sanitizing apparatus including a “cover” and a “base” that enclose the sanitizing components and form a housing defining an interior cavity. *See* Section VII.A.1.b, *supra*; Ex. 1006, ¶ [0005]. A POSITA would further understand that “first end wall” could refer either to the “base” of Watanabe or to the side of the “cover” which is opposite the base. *See* Section VII.A.1.c–e, *supra*.

Figures 2 and 7 of Watanabe depict the “base” and “cover” together to form a generally box-shaped structure which includes sidewalls extending perpendicularly between the “base” and the side of the “cover” opposite the base and form the lateral boundaries of the interior cavity. Ex. 1006, ¶ [0005]; Figs. 2, 7. A POSITA would recognize that these sidewalls obviously include interior-facing surfaces that at least partially define the interior cavity. Ex. 1003, ¶ 197.

To the extent that Watanabe does not expressly describe the sidewalls as being “integral” with the “base,” if a POSITA chose to use the “base” of Watanabe as the “first end wall” reference point, it would have been obvious to a POSITA that the sidewalls could have been manufactured to be part of the same structure as the “base,” or that the “cover” and “base” would be constructed as a single non-detachable structure at manufacture, as these are obvious and routine design choices with benefits of ease of use and simplified manufacturing. Ex. 1003, ¶ 198.

If a POSITA chose to use the side of the “cover” opposite the “base” of Watanabe to serve as the “first end wall” reference point, to the extent that Watanabe does not explicitly disclose the “sidewalls” as being “integral” with the “cover,” it would have likewise been obvious to a POSITA make such a modification. Ex. 1003, ¶ 199.

Accordingly, a POSITA would have found it obvious that Watanabe provides a sidewall extending from and integral with at least a portion of a first end wall, as recited in Element [1a.ii]. Ex. 1003, ¶ 200.

- e. **Element [1a.iii]: “a second end wall on an opposite end of the interior cavity from the first end wall having a second end wall interior surface at least partially defining the interior cavity,”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 202.

Watanabe teaches a sanitizing apparatus with a “cover” and a “base,” forming an enclosure such that the “cover” has a side which is opposite and parallel to the base. *See* Section VII.A.1.e, *supra*; Ex. 1003, ¶ 203.

A POSITA would have understood that this opposing surface of the cover functions as a wall at the opposite end of the interior cavity from the base and necessarily includes an interior-facing surface that at least partially defines the interior cavity. *Id.* at ¶ 204.

Although element [1a.iii] uses the term “second end wall,” a POSITA would recognize this as a generic descriptor for a housing wall located at the end opposite the first end wall. *Id.* at ¶ 205. A POSITA would therefore have found it obvious that the side of Watanabe’s “cover” opposite the “base” could correspond to the

claimed second end wall and include an interior surface that partially defines the interior cavity. *Id.* Likewise, a POSITA would have found it equally obvious to flip the “first” and “second” reference points, and would have found that doing so still obviously yielded the interior surface at least partially defining an interior cavity as described in Element [1a.iii]. *Id.*

f. Element [1b]: “wherein the second end wall at least partially defines an opening into the interior cavity; and”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 207.

Watanabe teaches a sanitizing apparatus including a “cover” opening provided for operating the doorknob, wherein the opening is sized to allow a user’s hand or arm to access the doorknob while limiting contact outside the operating region. *See* Section VII.A.1.f, *supra*. Watanabe also teaches a “base” with an opening provided for passing the doorknob through and into the interior cavity of the housing. *Id.*; Ex. 1003 ¶ 208.

A POSITA would have understood that both the “cover” opening and the “base” opening necessarily constitute an opening defined by a wall that allows access into the enclosed interior space formed by the “base” and “cover.” Ex. 1003, ¶ 209. A POSITA would find it obvious that the housing of Watanabe

inherently defines an interior cavity, and either or both the “cover” opening or “base” opening therefore at least partially defines an opening into that interior cavity. Ex. 1003, ¶ 210.

- g. Element [1c]: “at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity.”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 212.

Watanabe teaches the use of a germicidal lamp that irradiates the surface of the doorknob inside the cover body. *See* Section VII.A.1.g, *supra*; Ex. 1006, ¶ [0004].

A POSITA would have understood that mounting the germicidal lamp within the housing formed by the base and cover necessarily places the lamp within the interior cavity, such that the emitted germicidal light is directed into that cavity toward the doorknob. Ex. 1003, ¶ 214. Figure 8 further depicts multiple germicidal lamps mounted to the base within the housing, reinforcing that the germicidal light sources are disposed within the interior cavity and provide germicidal light into it. Ex. 1006, Fig. 8. In view of Watanabe, a POSITA would

have found it obvious to mount at least one germicidal light within the interior cavity of the apparatus. Ex. 1003, ¶ 214.

2. **Claim 2: “The apparatus of claim 1, wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe. Ex. 1003, ¶ 216.

Watanabe teaches an apparatus including multiple germicidal lamps mounted within the housing that surrounds the doorknob. *See* Section VII.A.2, *supra*; Ex. 1003, ¶ 217, Fig. 8.

A POSITA would have understood that arranging multiple germicidal light sources on opposite sides of the interior cavity is a routine and predictable configuration for increasing irradiation coverage of the doorknob surface. Ex. 1003, ¶ 218. Accordingly, a POSITA would have found it obvious that Watanabe at least renders obvious, the use of first and second germicidal light sources disposed on opposite sides of the interior cavity, as recited in Claim 2. Ex. 1003, ¶ 218.

3. Claim 3: “The apparatus of claim 2, wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe. Ex. 1003, ¶ 220.

Watanabe teaches an apparatus including multiple germicidal light sources affixed to the housing and disposed within the interior cavity, as shown and described with respect to the base-mounted lamps. *See* Section VII.A.3, *supra*; Ex. 1006, ¶ [0005], Figs. 2, 8.

A POSITA would have found it obvious that light sources, including the UV light sources in Watanabe, protrude into the interior cavity and project light towards their surroundings. Ex. 1003, ¶ 222. A POSITA would have also found it obvious that light projected from the UV lights in Watanabe propagates throughout the enclosed interior cavity and impinges upon the interior facing surfaces of the housing, including the sidewall interior surfaces. *Id.*

A POSITA, with an understanding of basic optics and material science, would have found it obvious that the sidewalls of the Watanabe housing will exhibit at least some degree of reflectivity with respect to the emitted UV radiation. Ex. 1003, ¶ 223. Accordingly, a POSITA would have found it obvious that when UV light is emitted by the germicidal light sources, a portion of that

light is reflected off the sidewall and projects back into the interior cavity. *Id.* at 224.

4. Claim 4: “The apparatus of claim 2, wherein at least one of the first germicidal light source or the second germicidal light source are cylindrical light sources.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe. Ex. 1003, ¶ 225.

Watanabe teaches that “various germicidal lamps that have been conventionally used can be used” in the disclosed apparatus, including “a rod-shaped germicidal lamp.” Ex. 1006, ¶ [0005], Fig. 8; *see* Section VII.A.4, *supra*.

A POSITA would have understood that cylindrical or rod-shaped lamps are a conventional and well-known form factor for germicidal UV light sources. Ex. 1003, ¶ 227. Accordingly, a POSITA would have found it obvious to use cylindrical germicidal light sources in the apparatus described by Watanabe, as recited in Claim 4. *Id.* at ¶ 227–228.

5. Claim 5: “The apparatus of claim 1, wherein the at least one germicidal light source forms a projection into the interior cavity and is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe. Ex. 1003, ¶ 229.

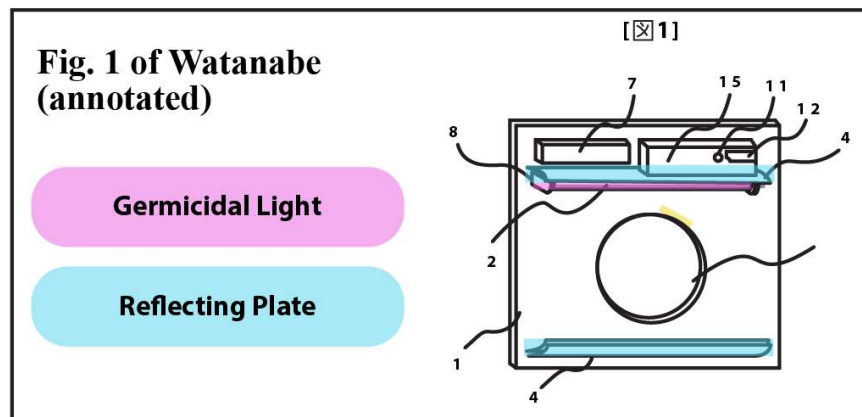
Conventionally used germicidal UV light sources, their characteristics, the use of lenses to modify light emission angles, and the plain and ordinary meanings of the terms “direct” and “projection” are within the knowledge of a POSITA. *See* Section VII.A.5, *supra*. Furthermore, a POSITA would have found it obvious to use a common fish-eye lens configured to distribute light over a field of view greater than 180 degrees. Ex. 1003, ¶ 229. A POSITA would have understood that fish-eye lenses are wavelength-agnostic optical components and could be readily adapted for use with UV or other germicidal wavelengths, and that they provide the known benefit of a wide projection (thus supporting the goal of broad sanitization in Watanabe). *Id.*

Additionally, Figures 4 and 8 of Watanabe disclose “rod-shaped” germicidal light sources that are mounted to the “base,” such that they protrude outward into the interior cavity. Ex. 1006 ¶ [0005], Figs. 4, 8. It would have been obvious to a POSITA that this would result in emission of germicidal light in a field greater than 180 degrees into the interior cavity because “rod-shaped” light sources emit light in 360 degrees, as a function of their shape. Ex. 1003, ¶ 223. Further, a POSITA would understand that the light mounting design shown in Watanabe would not result in a blocking of the light’s emission field such that it no longer directs in a field of view greater than 180 degrees. *Id.*

Accordingly, a POSITA would have found it obvious that Watanabe at least renders obvious, a germicidal light source forming a projection into the interior cavity and directing light with a field of view greater than 180 degrees, as recited in Claim 5. Ex. 1003, ¶ 234.

6. **Claim 6: “The apparatus of claim 1, wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are UV reflective and configured to reflect germicidal light from the at least one germicidal light source toward the object.”**

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 236.



Watanabe teaches the use of reflection plates configured to irradiate the entire doorknob with germicidal light by reflecting light emitted from the germicidal lamp toward the doorknob. Ex. 1006, ¶ [0004]. Watanabe further

explains that opposing reflectors are positioned to reflect germicidal light downward and upward toward the doorknob, as illustrated in Figure 1. Ex. 1006, ¶ [0004]; Fig. 1.

A POSITA would have understood that applying reflective material to additional interior surfaces of the housing—such as the walls defining the interior cavity—would have been obvious as a routine design choice to further improve irradiation coverage. Ex. 1003, ¶ 238. A POSITA would find nothing in Watanabe that discourages applying reflective material to the interior cavity surfaces, and Watanabe does not teach away from such a configuration. *Id.*; *see generally* Ex. 1006. Accordingly, a POSITA would have found that Watanabe renders Claim 6 obvious. Ex. 1003, ¶ 239

7. Claim 7: “The apparatus of Claim 6, wherein the second end wall comprises a curved structure with the second end wall interior surface following a curvature of the curved structure.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 240.

Watanabe teaches a sterilization device with a “base” and a “cover” surrounding a doorknob, and depicts this housing as having a rectangular box shape. *See* Section VII.B.1.b, *supra*; Ex. 1006, Figs. 2, 3, 7. Watanabe does not

require that the housing be box-shaped, nor does it teach away from the use of alternative housing configurations. *See generally* Ex. 1006; Ex. 1003, ¶ 241.

Further, Watanabe teaches that the reflective plate components are “**not limited [in] shape, and any shape may be used**” so long as the function of the reflective plates are preserved. Ex. 1006, ¶ [0005].

A POSITA would understand that the core sanitization functions of Watanabe are not tied to a singular housing shape configuration, and that alternative shapes could be obviously implemented. Ex. 1003, ¶ 243. Further, a POSITA would understand that Watanabe’s disclosure teaches, or at least suggests, that the shape of the elements of the housing can be manipulated so long as the sanitizing functionality is preserved. Ex. 1003, ¶ 243; Ex. 1006, ¶ [0005].

Moreover, a POSITA would understand and be able to modify a planar wall as in Watanabe into curved wall without altering the fundamental operation of the Watanabe device. Ex. 1003, ¶ 243. Such a modification would merely substitute one known geometric configuration, for both the housing and interior cavity structure, with another known configuration style. *Id.*

Accordingly, a POSITA would have found it obvious to alter the apparatus of Claim 6 to have a curved structure. Ex. 1003, ¶ 244.

8. Claim 8: “The apparatus of Claim 7, wherein the curved structure is fixed relative to the germicidal light source.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 246.

Nothing in Watanabe requires that any housing surface move relative to the germicidal lamp, nor does Watanabe suggest that relative movement between the housing walls and the light source is necessary to achieve sterilization. *See generally* Ex. 1006; Ex. 1003, ¶ 247. Rather, Watanabe’s design assumes a fixed spatial relationship between the housing surfaces and the germicidal lamp so that irradiation and reflection operate predictably. Ex. 1006, ¶[0004]–[0005]; Ex. 1003, ¶ 247.

A POSITA would understand that once the housing shape—whether rectangular or curved—is selected, maintaining that structure fixed relative to the germicidal light source is a routine and expected configuration that preserves alignment, irradiation coverage, and safety shielding. Ex. 1003, ¶ 248; *see* Section VII.B.7, *supra*. Accordingly, modifying the apparatus of Claim 7 so that the curved structure is fixed relative to the germicidal light source would have been an obvious design choice. Ex. 1003, ¶ 249.

9. **Claim 9: “The apparatus of claim 1, wherein the at least one germicidal light source is attached to the sidewall and spaced from the first end wall and the second end wall and the sanitizing surface is a point-of-contact sanitizing surface.”**

To the extent that Watanabe does not expressly this limitation, it is at least obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 251.

As discussed with respect to Claim 3, Watanabe teaches germicidal light sources mounted within the housing in positions that project into the interior cavity and irradiate the doorknob. *See* Section VII.A.3, *supra*; Ex. 1006, ¶ [0005], Figs. 1, 2, 8.

A POSITA would have understood that the particular mounting surface for the germicidal light sources—whether the base or a sidewall—is a routine design choice, so long as the sources are mounted within the housing and appropriately spaced to irradiate the interior cavity. Ex. 1003, ¶ 253. Watanabe does not teach away from attaching the germicidal light sources to a sidewall or spacing them from the end walls. *See generally* Ex. 1006.

Watanabe further teaches that the sanitizing surface is a point-of-contact surface, as it expressly relates to a sterilizer for a doorknob. Ex. 1006, ¶ [0001]. Because a doorknob is a point-of-contact surface, the subject matter recited in Claim 9 would have been obvious to a POSITA. Ex. 1003, ¶ 254.

10. Claim 10: “The apparatus of claim 1, wherein the first end wall is a posterior end wall, the second end wall is an anterior end wall, and the sidewall is coupled with the posterior end wall and projects in an anterior direction relative to the posterior end wall.”

To the extent that Watanabe does not expressly disclose this limitation, it is at least obvious over Watanabe. Ex. 1003, ¶ 256.

A POSITA would understand the '061 Patent's definitions of “posterior” and “anterior,” would understand that the term “wall” refers generically to a side of the apparatus housing, and would understand how the '061 Patent defines a distinction between “first end wall” and “posterior end wall” and between “second end wall” and “posterior end wall.” *See* Section VII.A.6, *supra*.

Watanabe does disclose a housing with two opposite “end walls” where one is proximate to the object to be sanitized, and the other is designed to allow for human access to the object to be sanitized. *See* Section VII.A.1, *supra*; Ex. 1006, ¶ [0005], Figs. 2, 7. Watanabe additionally discloses at least one “sidewall” that completes the “cover” of the housing, and is, at least as shown in the Figures, extends perpendicular, or “projects” from the “second end wall” and is likewise perpendicular to the “first end wall.” *Id.*

To the extent that the description of these features of Watanabe do not explicitly disclose the posterior and anterior walls with a sidewall as described in Claim 10, a POSITA would find it obvious to make the minor changes to the

housing of the Watanabe apparatus necessary to achieve what is described in Claim 10. Ex. 1003, ¶ 260; *see also* Section VII.B.1.d, *supra*.

11. Claim 11

a. Element [11pre]: “An apparatus for sanitizing an object, the apparatus comprising:”

This limitation is substantially the same as [1pre] above and is met for the same reasons. Ex. 1003, ¶ 262.

b. Element [11a]: “a housing at least partially defining an interior cavity configured to accept the object, wherein the object includes a sanitizing surface, the housing including:”

This limitation is substantially the same as [1a] above and is met for the same reasons. Ex. 1003, ¶ 263.

c. Element [11a.i]: “a posterior wall located at a first end of the interior cavity, the posterior wall having a posterior wall interior surface at least partially defining the interior cavity;”

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 264. This limitation differs from [1a.i] above only in that it requires a “posterior wall” rather than a “first end wall.” *Id.*

The '061 Patent defines “posterior” as “refer[ing] generally to the end of an apparatus or system [] proximate to a point of contact or to a structure to which the point of contact is attached (e.g., a wall or door).” Ex. 1001, 4:2–6; *see* Section VII.A.6, *supra*.

Watanabe also discloses a “base” that is “fixed to the door” that has the doorknob to be sterilized, and therefore is necessarily proximate to the point of contact to be sterilized. Ex. 1006, ¶ [0005]; *see* Section VII.A.1.c, *supra*.

To the extent that the “base” of Watanabe is not equivalent to the “posterior wall” of Element [11a.i], a POSITA would find it obvious to modify the “base” in order to make it equivalent to a “posterior wall,” and would understand generally that these Watanabe’s “base” and a “posterior wall” are insubstantially different. Ex. 1003, ¶ 268.

d. Element [11a.ii]: “a sidewall extending from and integral with at least a portion of the posterior wall, the sidewall having a sidewall interior surface at least partially defining the interior cavity; and”

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 270. This limitation differs from [1a.ii] above only in that it requires a “posterior wall” rather than a “first end wall.” *Id.*

As discussed with regards to Element [11a.i], a POSITA would find the “base” of Watanabe to be equivalent to a “posterior wall” as defined by the ’061 Patent, or would at least find the differences to be obvious. *See* Section VII.B.11.c, *supra*.

A POSITA would likewise understand that the relationship between the “sidewall” and “first end wall” of Element [1a.ii] is either equivalent to the relationship between the “sidewall” and the “posterior wall” of Element [11a.ii], or

that the differences between these configurations are obvious. Ex. 1003, ¶ 272; *see* Section VII.B.1.c, *supra*.

With this understanding, a POSITA would find that Element [11a.ii] is substantially the same as Element [1a.ii] above and would find that Watanabe at least renders this limitation obvious for the same reasons. *See* Section VII.B.1.d, *supra*.

- e. **Element [11a.iii]: “an anterior wall on an opposite end of the interior cavity from the posterior wall having an anterior wall interior surface at least partially defining the interior cavity,”**

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 274. This limitation differs from [1a.i] above only in that it requires an “anterior wall” rather than a “second end wall,” where the “anterior wall” is defined in relation to a “posterior wall.” *Id*.

As discussed in Element [11a.i], a POSITA would understand the “base” of Watanabe to at least be obviously modifiable into a “posterior wall” as defined by the ’061 Patent. *See* Section VII.B.11.c, *supra*; Ex. 1003, ¶ 275.

The ’061 Patent defines “anterior” as “refer[ing] generally to the end of the apparatus or system through or by which a human user may access the point of contact, such as by extension of a hand through anterior opening.” *See* Section VII.A.6, *supra*.

As discussed in Element [1a.iii], the side of the “cover” of Watanabe that is opposite the “base” includes an opening that is designed to allow for a human to reach inside the internal cavity and touch or operate the object to be sanitized. *See* Section VII.B.1.e, *supra*. A POSITA would therefore understand this opposite side of the “cover” of Watanabe at least be obviously modifiable into an “anterior wall” as defined by the ’061 Patent. Ex. 1003, ¶ 278.

With this understanding, a POSITA would find that Element [11a.iii] is substantially the same as Element [1a.iii] above, and would find that Watanabe at least renders this limitation obvious for the same reasons. *See* Section VII.B.1.e, *supra*.

f. Element [11b]: “wherein the anterior wall at least partially defines an opening into the interior cavity; and”

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 281. This limitation differs from [1b] above only in that it requires an “anterior wall” rather than a “second end wall.” *Id.*

A POSITA would understand the side of the “cover” of Watanabe that is opposite the “base” to at least be obviously modifiable into an “anterior wall” as defined by the ’061 Patent. *See* Section VII.B.11.e, *supra*.

With this understanding, a POSITA would find that Element [11b] is substantially the same as [1b] above and is rendered obvious by Watanabe for the same reasons. *See* Section VII.B.1.f, *supra*.

- g. Element [11c]: “at least one germicidal light source disposed within the interior cavity, wherein the germicidal light source provides germicidal light into the interior cavity, wherein the posterior wall interior surface, the anterior wall interior surface, and the sidewall interior surface are UV reflective and configured to reflect germicidal light from the at least one germicidal light source toward the object.”**

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 284. In view of the distinctions between “first end wall” and “posterior wall,” and “second end wall” and “anterior end wall,” and the natural UV reflectivity of the materials used to construct the Watanabe housing as discussed above, a POSITA would find that Element [11b] is substantially the same as Claim 6 above and is met for the same reasons. *See* Sections VII.B.1.c-f, VII.B.6, *supra*.

- 12. Claim 12: “The apparatus of claim 11, wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.”**

This limitation is substantially the same as Claim 2 above and is met for the same reasons. Ex. 1003, ¶ 287.

- 13. Claim 13: “The apparatus of claim 12, wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.”**

This limitation is substantially the same as Claim 3 above and met for the same reasons. Ex. 1003, ¶ 288.

- 14. Claim 14: “The apparatus of claim 11, wherein the at least one germicidal light source is attached to the sidewall and spaced from the posterior wall and the anterior wall and the sanitizing surface is a point-of-contact sanitizing surface.”**

This limitation is substantially the same as Claim 9 above met for the same reasons. Ex. 1003, ¶ 289.

- 15. Claim 15: “The apparatus of claim 11, wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”**

This limitation is substantially the same as Claim 5 above met for the same reasons. Ex. 1003, ¶ 290.

- 16. Claim 16: “The apparatus of claim 11, wherein the anterior wall comprises a curved structure with the anterior wall interior surface following a curvature of the curved structure.”**

This limitation is substantially the same as Claim 7 above and is met for the same reasons. Ex. 1003, ¶ 291.

17. Claim 17: “The apparatus of claim 16, wherein the curved structure is fixed relative to the germicidal light source.”

This limitation is substantially the same as Claim 8 above and is met for the same reasons. Ex. 1003, ¶ 292.

18. Claim 18:

a. Elements [18pre], [18a], [18a.i], [18a.ii], and [18b]

To the extent that Watanabe does not expressly teach each and every aspect of these limitations, Watanabe renders them obvious in light of the knowledge of a POSITA. *See* Sections VII.B.1.a–d, g, *supra*.

b. Element [18a.iii]

This limitation is obvious over Watanabe in light of the knowledge of a POSITA. Ex. 1003, ¶ 294. Watanabe would find it obvious that altering the structural shape of the Watanabe housing is possible, and that a variety of shape configurations are usable, including “curved structure.” *See* Section VII.B.7, *supra*.

19. Claim 19: “The apparatus of claim 18, wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”

This limitation is substantially the same as Claim 5 above and is met for the same reasons. Ex. 1003, ¶ 296.

- 20. Claim 20: “The apparatus of claim 19, wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are configured to reflect germicidal light from the at least one germicidal light source toward the object and the sanitizing surface is a point-of-contact sanitizing surface.”**

This limitation is substantially the same as Claim 6 above and is met for the same reasons. Ex. 1003, ¶ 297.

C. Ground 3: Claims 1-20 are obvious under 35 U.S.C. §103 over Watanabe in view of Stanley.

As detailed above, Claims 1-20 are rendered obvious by Watanabe based on the knowledge of a POSITA. *See* Section VII.B, *supra*. To the extent that Watanabe does not render any of these claims obvious, Watanabe in view of Stanley renders Claims 1-20 obvious under 35 U.S.C. §103.

1. Claim 1

a. Elements [1pre], [1a], [1a.i], [1a.iii], [1b], and [1c]

To the extent that Watanabe does not expressly teach each and every aspect of these limitations, Watanabe renders them obvious in light of the knowledge of a POSITA. *See* Sections VII.B.1.a–c, e–g, *supra*.

b. Element [1a.ii]: “a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and”

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.1.d, *supra*. To the extent that Watanabe does not

render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 299.

To the extent that the disclosure of Watanabe does not render “a sidewall extending from an integral with at least a portion of the first end wall” obvious to a POSITA, a POSITA would look to Stanley for an understanding of this limitation. Ex. 1003, ¶ 300.

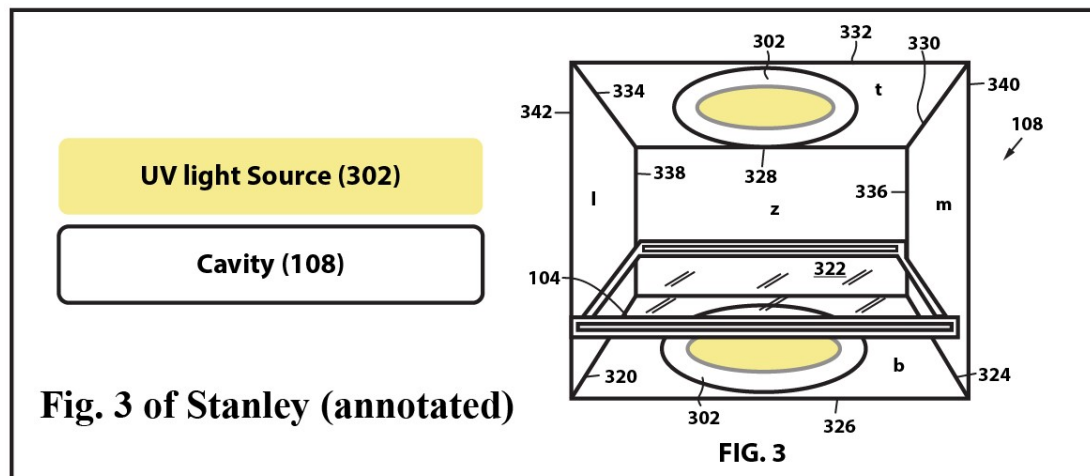
Stanley discloses a housing that defines an interior cavity where all surfaces that make up the interior cavity are integral with each other, where a POSITA could interpret “integral” to mean “non-detachable” or “part of the same structure or equivalent. Ex. 1007 ¶ [0035]. Specifically, Stanley states that “[e]ach wall is planar **and coupled to at least another wall** with the exception of the wall connected to [the] door.” *Id.* Stanley therefore discloses a sidewall extending from and integral with at least a portion of the first end wall, such that the sidewall at least partially defines the interior cavity. Ex. 1003, ¶ 301.

A POSITA would have been motivated to combine features of Stanley with Watanabe. *See Supra VI.C, supra.* A POSITA would have understood that because Watanabe and Stanley are analogous art within the same field of endeavor, elements of the housing of Stanley could be applied to the apparatus of Watanabe. Ex. 1003 ¶ 302. A POSITA could have, without undue experimentation, reconfigured the housing of Watanabe such that rather than being “detachably

attached,” the “cover” is part of the “base,” and is non-detachable, as is the case with the device housing in Stanley. *Id.*

2. **Claim 2: “The apparatus of claim 1, wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.2, *supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 304.



Stanley discloses that a “reference to an element in the singular is not intended to mean ‘one and only one’ unless specifically stated, but rather ‘**one or more.**’” Ex. 1007, ¶ [0066]. Further, the specification repeatedly states that the “disinfection unit” includes “*at least one* ultraviolet light source” and repeatedly

describes the function of “ultraviolet light *sources*.” Ex. 1007, ¶¶ [0006], [0039], [0063]. Likewise, Stanley illustrates embodiments using two UV light sources. Ex. 1007, Fig. 3.

A POSITA would have been motivated to combine aspects of the Stanley device with Watanabe. *See Supra VI.C, supra*. A POSITA would have understood that the inclusion of multiple lights within the interior chamber, as in Stanley, could be applied to Watanabe without undue experimentation. Ex. 1003 ¶ 306. Additionally, the functional advantage of increasing the amount or intensity of germicidal light within the interior cavity provided by additional light sources would have been readily apparent to a POSITA, and obvious in light of Stanley. *Id.*

3. Claim 3: “The apparatus of claim 2, wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.”

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See Section VII.B.3, supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 308.

Stanley discloses that the “[c]avity [] also includes at least one ultraviolet light source [.] Placement of the ultraviolet light sources [] within cavity [] may

vary and are not limited to the positions described herein.” Ex. 1007, ¶ [0039].

The UV lights of Stanley irradiate the interior cavity of the device. Ex. 1007, ¶ [0006]. Therefore, Stanley explicitly discloses that the light emitted from the UV light sources impinges upon all surfaces of the interior cavity, and to the extent that it does not, a POSITA would have found this to be an obvious consequence of placing a light source inside an enclosed volume. Ex. 1003, ¶ 309.

Additionally “[a]s depicted in FIG. 3, one ultraviolet light source [] is coupled to bottom wall.” Ex. 1007, ¶ [0039], Fig. 3. A POSITA would understand this “bottom wall” to be analogous to the “sidewall” of Claim 3. Ex. 1003, ¶ 309. Stanley also discloses that the placement of the ultraviolet light source “**may vary** and are not limited to the positions described.” Ex. 1007, ¶ [0039]. A POSITA would therefore understand from Stanley that the ultraviolet light sources may be in any position on any of the interior surface walls. Ex. 1003, ¶ 312

Stanley also discloses that “reflective coatings can be placed on the walls.” Ex. 1007, ¶ [0042]. “Through the [] coatings, **reflectivity can be increased** to greater than ninety-nine point ninety-nine percent.” *Id.* ¶ [0043]. Stanley therefore discloses that the materials used to construct the interior surface of the housing have some inherent reflectivity that can be increased by use of special coatings. Ex. 1003, ¶ 313. The inherent reflectivity of materials is within the realm of knowledge of a POSITA. *See* Section VII.A.3, *supra*.

Therefore, Stanley discloses germicidal light “project[ing]” from the sidewall interior surface an into the cavity. A POSITA would find it obvious to combine the analogous Stanley and Watanabe disclosures, and would find it obvious and not requiring undue experimentation to alter the housing of Watanabe by moving the germicidal light sources to the sidewalls as in Stanley. Ex. 1003, ¶ 314.

4. **Claim 4: “The apparatus of claim 2, wherein at least one of the first germicidal light source or the second germicidal light source are cylindrical light sources.”**

To the extent that Watanabe does not expressly teach each and every aspect of this limitation, Watanabe renders it obvious in light of the knowledge of a POSITA. *See* Sections VII.B.4, *supra*.

5. **Claim 5: “The apparatus of claim 1, wherein the at least one germicidal light source forms a projection into the interior cavity and is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”**

To the extent that Watanabe does not expressly teach each and every aspect of this limitation, Watanabe renders it obvious in light of the knowledge of a POSITA. *See* Sections VII.B.5, *supra*.

6. **Claim 6: “The apparatus of claim 1, wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are UV reflective and configured to reflect germicidal light from the at least one germicidal light source toward the object.”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.6, *supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. Ex. 1003 ¶ 318.

Stanley discloses an interior cavity where the entire surface is UV reflective and reflects the light from at least one germicidal UV light source such that the entire surface of the object to be sanitized is exposed to the UV light. Ex. 1007, ¶ [Abstract], [0006] [0008], Cls. 1, 17, 20.

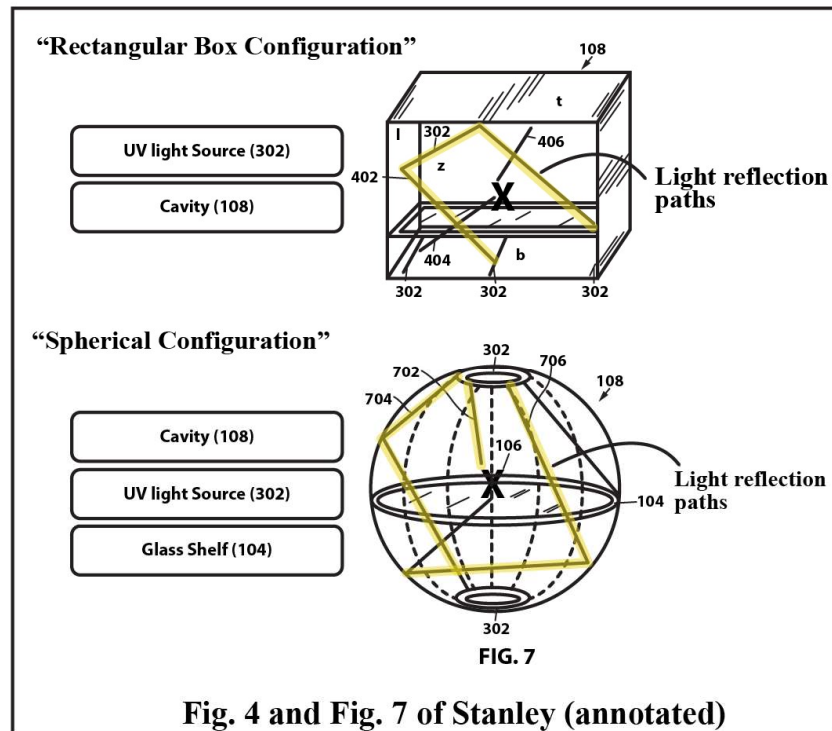


Fig. 4 and Fig. 7 of Stanley (annotated)

Stanley discloses that the interior walls of the “disinfection unit” are reflective. *Id.* For example, the abstract states that the unit’s interior cavity has “a **reflective interior** for redirecting light produced by at least one ultraviolet light source.” Ex. 1007, ¶ [0006]. “Furthermore, the reflective walls of the chamber **redirect any ultraviolet light into the item**, just disinfecting or sterilizing the entire surface area of the item.” *Id.*

Moreover, Stanley teaches that the inner surface of the housing, forming the interior cavity, “can include reflective material to redirect the ultraviolet light... [t]he reflective material can be made of a thin polished layer of metal, such as aluminum.” Ex. 1007, ¶ [0040]. Stanley also envisions the use of “reflective

coatings” such as “dielectric coatings... [that] can include magnesium fluoride, calcium fluoride, and various metal oxides.” Ex. 1007, ¶ [0042]. The use of reflective walls “allow[s] for items to be struck around three hundred sixty degrees even though items [] are not placed within the middle” of the chamber.” Ex. 1007, ¶ [0051]. Thus, Watanabe in view of Stanley renders this limitation obvious. Ex. 1003, ¶ 322.

7. **Claim 7: “The apparatus of claim 6, wherein the second end wall comprises a curved structure with the second end wall interior surface following a curvature of the curved structure.”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.7, *supra*. To the extent Watanabe does not anticipate or render obvious Claim 7, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 323. Stanley explicitly discloses and claims a curved interior structure, and also implicitly discloses such a structure by envisioning a variety of possible structural embodiments. Ex. 1007, ¶ [0025], [0052], Cl. 5, Figs. 6, 7.

Figure 6 of Stanley “depicts exemplary placements of illustrative ultraviolet light sources **within the spherical configuration of the cavity.**” *Id.* at ¶ [0015], Fig. 6. Figure 7 shows this same spherical configuration with reflective interior surface resulting in reflection of UV light from multiple sources. *Id.* at ¶ [0016], Fig. 7. Further, Claim 5 of Stanley recites “the reflective interior **comprises**

curved walls.” *Id.* at Cl. 5. In general, the Stanley device is contemplated as being configurable in multiple shapes, including a “a **bubble top**... or any other shape.” *Id.* at ¶ [0025].

A POSITA would understand from Stanley’s disclosure that the interior cavity of sanitizing apparatuses can obviously be designed in a multitude of shapes and structures, including a variety of “curved structure[s]” as in Claim 7 of the ’061 Patent. Ex. 1003, ¶ 325.

8. Claim 8: “The apparatus of claim 7, wherein the curved structure is fixed relative to the germicidal light source.”

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.8, *supra*. To the extent Watanabe does not anticipate or render obvious Claim 7, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 327. Stanley discloses a curved housing structure with affixed germicidal light sources. *Id.* at ¶ 327; Ex. 1007, ¶ [0016], Fig. 6.

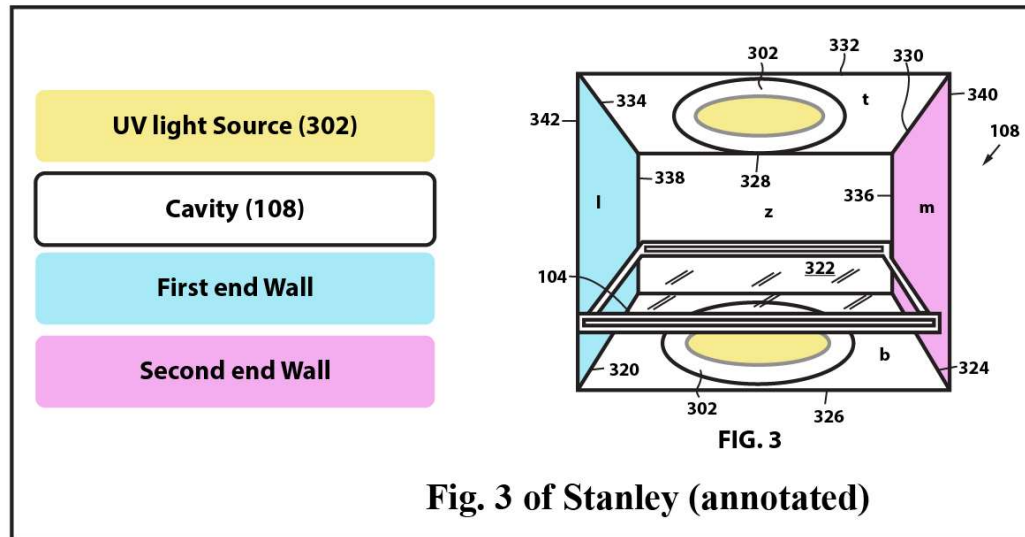
Figure 6 of Stanley shows a curved interior surface structure with two germicidal light sources affixed and opposite each other. Ex. 1007, ¶ [0016], Fig. 6. Stanley does not suggest anywhere in its specification or figures that the light sources are movable within or relative to the housing structure, or *vice versa*, in any housing configuration. *See generally* Ex. 1007. A POSITA would understand that when designing an apparatus using a “curved” or “spherical” housing

configuration, as disclosed by Stanley and discussed with respect to Claim 7, any light sources within the internal cavity are fixed to the housing. Ex. 1003, ¶ 329. Therefore, the curved structure is likewise fixed relative to the germicidal light sources. *Id.*

9. **Claim 9: “The apparatus of claim 1, wherein the at least one germicidal light source is attached to the sidewall and spaced from the first end wall and the second end wall and the sanitizing surface is a point-of-contact sanitizing surface.”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.9, *supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 331.

Stanley discloses at least one germicidal light source that is attached to a sidewall and is spaced from a first end wall and a second end wall. *Id.* at ¶332; Ex. 1007, ¶ [0032], [0039], Fig. 3.



Stanley depicts a “rectangular box configuration.” Ex. 1007, ¶ [0032], [0039], Fig. 3. In this configuration, the “[c]avity [] also includes at least one ultraviolet light source [.] **Placement of ultraviolet light sources [] within cavity [] may vary** and are not limited to the positions described herein. As depicted in FIG. 3, one ultraviolet light source [] **is coupled to bottom wall b.**” *Id.* at ¶ [0039]. A POSITA would understand this “bottom wall” to be analogous to the “sidewall” recited in claim 3, and would likewise understand the remaining sides of the rectangular box configuration to be analogous to the “first” and “second end walls” of claim 3. Ex. 1003, ¶ 333. A POSITA would further understand that a germicidal light source could be mounted on any interior wall of the cavity, including in a position spaced between two other walls, as illustrated in Figure 3 of Stanley. *Id.*, ¶ 334.

- 10. Claim 10: “The apparatus of claim 1, wherein the first end wall is a posterior end wall, the second end wall is an anterior end wall, and the sidewall is coupled with the posterior end wall and projects in an anterior direction relative to the posterior end wall.”**

To the extent that Watanabe does not expressly teach each and every aspect of this limitation, Watanabe renders it obvious in light of the knowledge of a POSITA. *See* Sections VII.B.10, *supra*.

11. Claim 11

- a. Elements [11pre], [11a], [11a.i], [11a.iii], [11b], and [11c]**

To the extent that Watanabe does not expressly teach each and every aspect of these limitations, Watanabe renders them obvious in light of the knowledge of a POSITA. *See* Sections VII.B.11.a–c, e–g, *supra*.

- b. Element [11a.ii]: “a sidewall extending from and integral with at least a portion of the posterior wall, the sidewall having a sidewall interior surface at least partially defining the interior cavity; and”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.11.d, *supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. *See* Section VII.C.1.b, *supra*.

- 12. Claim 12: “The apparatus of claim 11, wherein the germicidal light source is a first germicidal light source, further comprising a second germicidal light source disposed on an opposite side of the interior cavity from first germicidal light source.”**

This limitation is substantially the same as Claim 2 above and is met for the same reasons. Ex. 1003, ¶ 339.

- 13. Claim 13: “The apparatus of claim 12, wherein the first germicidal light source and the second germicidal light source each project from the sidewall interior surface into the interior cavity.”**

This limitation is substantially the same as Claim 3 above and is met for the same reasons. Ex. 1003, ¶ 340.

- 14. Claim 14: “The apparatus of claim 11, wherein the at least one germicidal light source is attached to the sidewall and spaced from the posterior wall and the anterior wall and the sanitizing surface is a point-of-contact sanitizing surface.”**

This limitation is substantially the same as Claim 9 above and is met for the same reasons. Ex. 1003, ¶ 341.

- 15. Claim 15: “The apparatus of claim 11, wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”**

This limitation is substantially the same as Claim 5 above and is met for the same reasons. Ex. 1003, ¶ 342.

- 16. Claim 16: “The apparatus of claim 11, wherein the anterior wall comprises a curved structure with the anterior wall interior surface following a curvature of the curved structure.”**

This limitation is substantially the same as Claim 7 above and is met for the same reasons. Ex. 1003, ¶ 343.

- 17. Claim 17: “The apparatus of claim 16, wherein the curved structure is fixed relative to the germicidal light source.”**

This limitation is substantially the same as Claim 8 above and is met for the same reasons. Ex. 1003, ¶ 344.

18. Claim 18

a. Elements [18pre], [18a], [18a.i], and [18b]

To the extent that Watanabe does not expressly teach each and every aspect of these limitations, Watanabe renders them obvious in light of the knowledge of a POSITA. *See* Sections VII.B.1.a–c, g, *supra*.

b. Element [18.ii]: “a sidewall extending from and integral with at least a portion of the first end wall and having a sidewall interior surface at least partially defining the interior cavity; and”

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.1.d, *supra*. To the extent that Watanabe does not render this limitation obvious in light of the knowledge of a POSITA, Watanabe in view of Stanley renders it obvious. *See* Section VII.C.1.b, *supra*.

- c. **Element [18.iii]: “a second end wall on an opposite end of the interior cavity from the first end wall, the second end wall having a curved structure and a second end wall interior surface at least partially defining the interior cavity, wherein the second end wall at least partially defines an opening into the interior cavity; and”**

Watanabe at least renders this limitation obvious in light of the knowledge of a POSITA. *See* Section VII.B.18.b, *supra*. To the extent Watanabe does not anticipate or render obvious this limitation, Watanabe in view of Stanley renders it obvious. Ex. 1003, ¶ 347.

A POSITA would understand from Stanley’s disclosure that the interior cavity of sanitizing apparatuses can obviously be designed in a multitude of shapes and structures, including a variety of “curved structure[s].” *See* Section VII.C.7, *supra*.

19. **Claim 19: “The apparatus of claim 18, wherein the at least one germicidal light source is configured to direct the germicidal light with a field of view greater than 180 degrees into the interior cavity.”**

This limitation is substantially the same as Claim 5 above and is met for the same reasons. Ex. 1003, ¶ 349.

- 20. Claim 20: “The apparatus of claim 19, wherein the first end wall interior surface, the second end wall interior surface, and the sidewall interior surface are configured to reflect germicidal light from the at least one germicidal light source toward the object and the sanitizing surface is a point-of-contact sanitizing surface.”**

This limitation is substantially the same as Claim 6 above and is met for the same reasons. Ex. 1003, ¶ 350.

VIII. CONCLUSION

Based on the foregoing, Claims 1–20 of the '061 Patent are unpatentable. Petitioner respectfully requests that the Board grant the Petition and cancel Claims 1–20 for unpatentability.

IX. MANDATORY NOTICES

A. Real Party-in-Interest Under 37 C.F.R. § 42.8(b)(1)

Hyundai Motor America, Inc. is the real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

Patent Owner has asserted the '061 Patent against Petitioner in a co-pending litigation, *Germ Dome Industries LLC v. Hyundai Motor America*, No: 8:25-cv-02593 (C.D. Cal.) (“Central District of California Action”), filed November 18, 2025. Ex. 1015. Patent Owner has asserted at least Claims 1, 6, 10, and 11 of the '061 Patent. Ex. 1015. No rulings related to the '061 Patent have been issued. Trial has not been scheduled as of filing this Petition.

**PETITION FOR *POST-GRANT* REVIEW
OF U.S. PATENT NO. 12,296,061**

Petitioner is not aware of any disclaimers, reexamination certificates, or petitions for *inter partes* or post-grant review for the '061 Patent.

C. Counsel and Service Information Under 37 C.F.R. § 42.8(b)(3) & (b)(4)

Petitioner provides the following designation of counsel. Petitioner consents to electronic service of documents to the email addresses identified below.

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**PETITION FOR *POST-GRANT* REVIEW
OF U.S. PATENT NO. 12,296,061**

D. Payment Of Fees Under 37 C.F.R. § 42.103

Petitioner authorizes the Patent and Trademark Office to charge Deposit

Account No. 033975 for the petition fee and for any other required fees.

Respectfully submitted,

/Robert C.F. Pérez /

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that the foregoing Petition complies with the type volume limitations of 37 C.F.R. §42.24(a)(1)(i). This Petition contains 16,314 words (excluding the table of contents, the table of authorities, mandatory notices under 37 CFR § 42.8, the certificate of service, certificate of compliance, and appendix of exhibits), as calculated by the “Word Count” feature of Microsoft Word 360, the word processing program used to create it.

The undersigned further certifies that this brief complies with the typeface requirements of 37 CFR § 42.6(a)(2)(ii) and typestyle requirements of 37 CFR § 42.6(a)(2)(iii). This Petition has been prepared in a proportionally spaced typeface using Microsoft Word in Times New Roman 14-point font.

Dated: February 13, 2026

Respectfully submitted,

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**PETITION FOR *POST-GRANT* REVIEW
OF U.S. PATENT NO. 12,296,061**

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true copy of the foregoing
PETITION FOR *POST-GRANT* REVIEW OF U.S. PATENT NO. 12,296,061
and supporting materials have been served in its entirety by electronic mail this
13th day of February, 2026, and to be sent by FedEx on February 13, 2026 on the
Agent for Patent Owner at the correspondence address for the attorney of record
for U.S. Patent No. 12,296,061 shown in USPTO Patent Center:

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