CASE NO.: **CV 13-06089 SJO (FFMx)** **DATE:** **July 24, 2014**

TITLE: **MAG Aerospace Industries, Inc. v. B/E Aerospace, Inc.**

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PRESENT: THE HONORABLE S. JAMES OTERO, UNITED STATES DISTRICT JUDGE

Victor Paul Cruz	Not Present
Courtroom Clerk	Court Reporter

COUNSEL PRESENT FOR PLAINTIFF(S):	**COUNSEL PRESENT FOR DEFENDANT(S):**
Not Present	Not Present

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PROCEEDINGS (in chambers): ORDER CONSTRUING CLAIM TERMS [Docket No. 46]

This matter is before the Court for claim construction. On May 19, 2014, Plaintiff MAG Aerospace Industries, Inc. ("Plaintiff") filed its Opening Markman Brief ("Plaintiff's Brief," ECF No. 46). On June 3, 2014, Defendant B/E Aerospace, Inc. ("Defendant") submitted a Responsive Claim Construction Brief ("Defendant's Brief," ECF No. 56), to which Plaintiff filed a Reply on June 13, 2014 (ECF No. 58). The Court held a *Markman* hearing on July 2, 2014. (ECF No. 62.)

I. FACTUAL AND PROCEDURAL BACKGROUND

The current dispute concerns three patents owned by Plaintiff: U.S. Patent Nos. 6,353,942 ("the '942 Patent"); 6,536,054 ("the '054 Patent"); and 6,536,055 ("the '055 Patent") (collectively, "Asserted Patents"). (*See generally* Compl., ECF No. 1.) All three patents relate to vacuum toilet assemblies and methods for repairing these toilets. (Compl. ¶ 9 & Exs. A-C.) On August 20, 2013, Plaintiff filed the instant lawsuit alleging that Defendant's sale and manufacture of vacuum toilets for aircraft infringe multiple claims of the Asserted Patents. (*See generally* Compl.)

The application for the '942 Patent was filed on November 16, 2000, and the patent was issued on March 12, 2002. On January 22, 2002, a patent application was filed for the '054 Patent, and on February 1, 2002, an application was filed for the '055 Patent. Both of these patents issued on March 25, 2003. The '055 Patent is related to the '942 Patent, and both the '942 Patent and the '055 Patent are titled "Modular Vacuum Toilet with Line Replaceable Units." These two patents describe a modular vacuum toilet and methods for repairing that toilet by replacing specific modules within the toilet without removing the entire toilet, thus making repair quicker and easier. The '054 Patent, titled "Vacuum Toilet Bowl Assembly Having Removable Bowl," describes a vacuum toilet with a toilet bowl positioned on a support frame. The toilet bowl can be removed and replaced without tools, again making repair simple and fast.

The parties selected four terms to be construed at the claim construction hearing on July 2, 2014: (1) the phrase "out-turned flange supported by the top of the support structure," found in Claims

1 and 13 of the '942 Patent ('942 Patent 10:13-14, 11:6-7); (2) the phrase "line replaceable unit ('LRU')," found in Claims 13, 14, and 17 of the '942 Patent ('942 Patent 11:17-23, 24-25, 31-34) and Claims 1 and 15 of the '055 Patent ('055 Patent 10:35-40, 11:32-41); (3) the term "toollessly," found in Claims 1 and 10 of the '054 Patent ('054 Patent 4:65, 5:23); and (4) the phrase "lifting the receptacle . . . so that . . . ," found in Claim 10 of the '054 Patent ('054 Patent 5:36-40).

II. DISCUSSION

Claim construction, the process of giving proper meaning to the claim language, is a question for the court. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996); *see also Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, 744 F.3d 1272, 1276-77 (Fed. Cir. 2014). "Courts construe claim terms in order to assign a fixed, unambiguous, legally operative meaning to the claim." *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1377 (Fed. Cir. 2005).

In claim construction, claim terms "are generally given their ordinary and customary meaning." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the application." *Id*. at 1313. "Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

To determine the ordinary and customary meaning of a claim term, a court must "look[] to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean," including "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id*. at 1314 (internal citations and quotation marks omitted). This evidence, however, is not all of equal importance in the claim construction analysis. *See id*. at 1314-19; *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582-84 (Fed. Cir. 1996). Rather, "[i]t is well-settled that . . . the court should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history." *Vitronics*, 90 F.3d at 1582. This "intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Id*.

"It is elementary that claim construction begins with, and remains focused on, the language of the claims." *Biagro W. Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1302 (Fed. Cir. 2005). Thus, in construing claim terms, a court first "look[s] to the words of the claims themselves, both asserted and nonasserted . . . ." *Vitronics*, 90 F.3d at 1582. "[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms." *Phillips*, 415 F.3d at 1314. For instance, "the context in which a term is used in the asserted claim can be highly instructive" and often provides a "firm basis for construing the term." *Id*. In addition, "[o]ther claims of the patent in question, both asserted and unasserted, can . . . be valuable sources of enlightenment as to

the meaning of a claim term" and "can often illuminate the meaning of the same term in other claims." *Id*. Similarly, "[d]ifferences among claims can . . . be a useful guide in understanding the meaning of particular claim terms," *id*., as differences in claim terms "are presumed to reflect a difference in the scope of the claims," *Forest Labs., Inc. v. Abbott Labs.*, 239 F.3d 1305, 1310 (Fed. Cir. 2001).

The claims should not be read in isolation but "must be read in view of the specification, of which they are a part." *Phillips*, 415 F.3d at 1315. Thus, after considering the claim language, the court must next look to the rest of the specification. *Vitronics*, 90 F.3d at 1582. The specification is "always highly relevant to the claim construction analysis" and "is the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315. Nevertheless, the court should not import limitations from the specification into the claims. *See ICU Med., Inc. v. Alaris Med. Sys., Inc.*, 558 F.3d 1368, 1375 (Fed. Cir. 2009); *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). However, a court must also examine the intrinsic evidence "to determine whether the patentee has set forth an explicit definition of a term contrary to its ordinary meaning, has disclaimed subject matter, or has otherwise limited the scope of the claims." *Day Int'l, Inc. v. Reeves Bros.*, 260 F.3d 1343, 1348 (Fed. Cir. 2001).

"In addition to consulting the specification, . . . a court should . . . consider the patent's prosecution history, if it is in evidence." *Phillips*, 415 F.3d at 1317; *see Vitronics*, 90 F.3d at 1582. The prosecution history "consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317; *see Vitronics*, 90 F.3d at 1582. "Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent," which may "inform the meaning of the claim language." *Phillips*, 415 F.3d at 1317. Nevertheless, the prosecution history "often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id*.

Courts may also rely on extrinsic evidence, "including expert and inventor testimony, dictionaries, and learned treatises." *Id*. Although extrinsic evidence may "shed useful light on the relevant art," it is "less significant" and "less reliable" than the intrinsic record in determining the legally operative meaning of a claim term. *Id.* at 1317-18. "A court should discount any expert testimony 'that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.'" *Id.* at 1318 (citing *Key Pharm. v. Hercon Labs. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998)).

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A. Out-turned Flange Supported by the Top of the Support Structure

Plaintiff's Proposal	Defendant's Proposal
The claim term "flange" means "rim, edge, or rib." The rest of the phrase has its plain and ordinary meaning.	The phrase means "outside rim turned away from the sidewall, overlying and transferring loads to the top of the support structure."

The phrase "out-turned flange supported by the top of the support structure" occurs in Claims 1 and 13 of the '942 Patent. ('942 Patent 10:13-14, 11:6-7.) Claim 13 describes "[a] method of servicing a vacuum toilet having a waste receptacle for receiving waste . . . , a stationary frame support having a top with an opening therethrough, the waste receptacle including a sidewall sized for insertion into the opening and having an **out-turned flange supported by the top of the support structure** . . . ." ('942 Patent 11:1-7 (emphasis added).) Claim 1 describes a modular vacuum toilet with similar language. ('942 Patent 10:6-16.) Thus, the vacuum toilets described in both claims contain a waste receptacle having an out-turned flange, where the flange is supported by the top of a stationary frame support structure.

The specification of the '942 Patent describes the patentees' preferred embodiment of the vacuum toilet. This embodiment includes a "bowl . . . for receiving waste material," with the bowl having "a curved sidewall **38** and an out-turned flange **40** extending about an upper edge of the sidewall." ('942 Patent 4:53-55.) The specification includes figures illustrating this embodiment. ('942 Patent figs. 1A & 1B.) In this embodiment, "the out-turned flange **40** closely overlies the frame top member **28** so that the downward forces applied to the bowl **36** are transferred to the frame **20**." ('942 Patent 5:4-6.) The specification states that "[a]s a result, the bowl **36** is not a load-bearing component, and may be made of non-structural materials . . . " ('942 Patent 5:7-8.) As illustrated in Figures 1A and 1B, in this embodiment the upper rim of the waste bowl has an out-turned flange that rests on top of the support structure.

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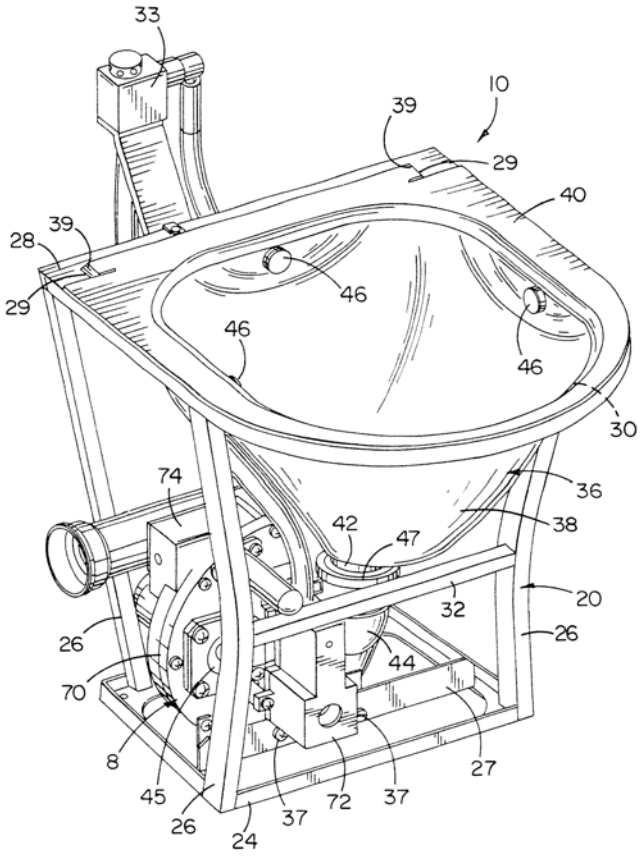

FIG. IA

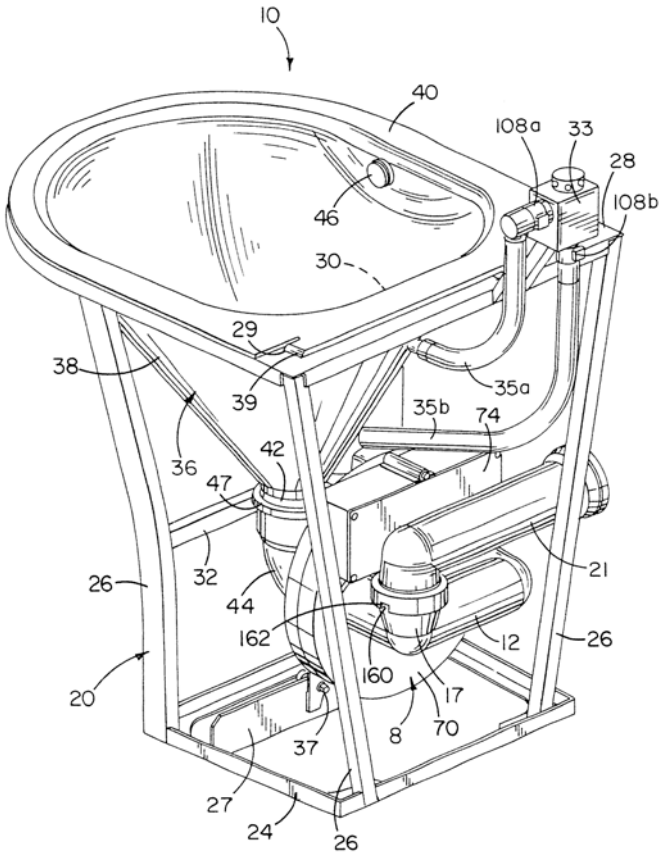

FIG. IB

Figure 1: Figures 1A and 1B of the '942 Patent. These figures illustrate a vacuum toilet having a waste bowl **36**, with the bowl having "a curved sidewall **38** and an out-turned flange **40** extending about an upper edge of the sidewall." ('942 Patent 4:53-55.)

The parties dispute whether the out-turned "flange" described in the claims must be located on the upper rim of the waste bowl, as it is in the '942 Patent's preferred embodiment, or whether the flange can be located anywhere on the exterior sidewall of the receptacle. (Pl.'s Br. 8; Def.'s Br. 8-10.) As discussed at the *Markman* hearing, the parties also dispute whether the claim term "flange" must be a "rim" in the context of the claim and specification, or whether it may also include a waste receptacle's out-turned edges and ribs. (Markman Hr'g Tr., 16:1-9, 33:7-10, 105:12-13, July 2, 2014, ECF No. 72.) Finally, Defendant seeks to construe the phrase "supported by the top of the support structure" to mean "overlying and transferring loads to the top of the support structure," while Plaintiff argues that this phrase has its plain and ordinary meaning. At the *Markman* hearing, Plaintiff clarified that the term "support" indicates that the flange transfers loads

from the bowl to the support structure. (Markman Hr'g Tr., 40:20-25.) Thus, this final dispute appears limited to whether the flange must overlie the top of the support structure, or whether it can transfer loads to the support structure by other means.

First, the Court considers whether the flange must be located at the upper edge of the waste receptacle, as required by Defendant's construction, or whether it may be located anywhere along the sidewall, as allowed by Plaintiff's construction. Claim construction begins by looking at the words of the claims themselves. Here, the claims do not specify the location of the out-turned flange on the waste receptacle except with respect to the support structure, which supports the flange. The court must also consider the words of the claims in the context of the specification; however, the court should not import limitations from the specification into the claims. *See ICU Med.*, 558 F.3d at 1375; *Renishaw*, 158 F.3d at 1248. The specification teaches a preferred embodiment with a waste bowl having an out-turned flange on the upper edge of the bowl's sidewall, so that the bowl itself is not load-bearing and may be made of non-structural material. (*See* '942 Patent 5:7-8.) Because the bowl described in the preferred embodiment is not load-bearing, the flange is located on the upper edge of the bowl's sidewall to immediately transfer loads to the support frame. Flanges located elsewhere on the sidewall require an at least partially load-bearing bowl.

However, while the preferred embodiment matches Defendant's construction, the claim language permits other embodiments, for example, a load-bearing bowl made of structural materials that could be supported by a flange located elsewhere on the sidewall. A waste bowl with flanges on the upper edge of the bowl can be installed on top of the support frame and easily removable, but so could a waste bowl with flanges elsewhere on the sidewall, so long as the flanges are supported by the top of the support frame. Because the specification does not disclaim a bowl with a flange elsewhere than the rim, restricting the location of the flange to the upper edge of the sidewall would unnecessarily import a limitation from the specification into the claims.

In its Brief, Defendant argued that the "out-turned flange" limitation was expressly added to "avoid the application of prior art." (Def.'s Br. 11; *see also* Decl. of Benjamin Haber in Supp. of Def.'s Br. ("Haber Declaration"), ECF No. 56-1, Ex. F, at 1, Ex. G, at 4.) At the *Markman* hearing, Defendant specified for the first time that the relevant prior art was U.S. Patent No. 5,271,105 ("the Tyler Patent"), which disclosed a load-bearing bowl supported from underneath by a frame. However, the waste receptacle described in the Tyler Patent does not include any flanges for support (*see* Tyler Patent fig. 1), so it is the presence of a flange—and not the specific location or configuration of that flange—that differentiates the Tyler Patent from the '942 Patent. Furthermore, the examiner did not add language limiting the bowl to a non-load-bearing bowl or specifying the location of the flange. Thus, while the cited prosecution history confirms that the present invention requires a "flange" on the waste receptacle, it does not speak to the parties' disputes about the location or configuration of that flange or the capability of the waste receptacle to bear loads. It therefore appears that in this invention, based on the intrinsic evidence, a flange can be located anywhere on the sidewall of the waste bowl.

The extrinsic evidence reinforces this construction. Dictionaries are not clear or uniform on the question of whether the placement of a "flange" is restricted to the outer edge or rim of an object. For example, the *American Heritage Dictionary* defines "flange" as "[a] protruding rim, edge, rib, or collar, as on a pipe shaft, used to strengthen an object, hold it in place, or attach it to another object" (Decl. of Erwin L. Cena in Supp. of Pl.'s Br. ("Cena Declaration"), ECF No. 46-1, Ex. E, at 3, ECF No. 52), and *Webster's Dictionary* defines "flange" as "a rim or edge projecting at right angles" (Haber Decl., Ex. A, at 2, ECF No. 56-2). Neither definition limits the placement of a flange to the outer edge or rim of an object. Two other cited dictionaries are less clear. The *Dictionary of Aviation* defines "flange" as "the outside edge or rim of a part such as a beam or wheel," and the *McGraw-Hill Dictionary of Technical Terms* defines flange as "a projecting rim . . . of a mechanical part." (Haber Decl., Ex. D, at 3, ECF No. 56-5, Ex. E, at 4, ECF No. 56-6.) Taking into account all of the dictionary sources, there appears to be no clear or uniform requirement that the flange's location lie on the upper rim of the waste receptacle.

Moreover, U.S. Patent No. 5,231,706 ("the Kendall Patent")[1] suggests that a person of ordinary skill in the art would not, in the context of the '942 Patent, consider it necessary to locate a toilet's "flange" on the upper edge of the waste bowl. The Kendall Patent, issued in 1993, concerns toilets and other sanitary fixtures. The specification of the Kendall Patent describes and illustrates "[f]langes extending outwardly" from the sidewall of the toilet's waste bowl, not on the rim of the bowl. (*See* Kendall Patent 5:17-19 & fig. 1.) This suggests that a person of ordinary skill in the art would not limit the term "flange" in the context of the '942 Patent to the upper edge of a waste bowl, but would understand that a flange could be located elsewhere on the sidewall of the waste bowl.

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[1] The Kendall Patent was cited during the prosecution of the '054 Patent, but not during the prosecution of the '942 Patent or the '055 Patent, so it does not constitute intrinsic evidence. *See Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1167 (Fed. Cir. 2004). Nonetheless, the Court may "in its discretion admit and rely on prior art . . . whether or not cited in the specification or the file history." *Vitronics*, 90 F.3d at 1584. "This prior art can often help to demonstrate how a disputed term is used by those skilled in the art." *Id.*

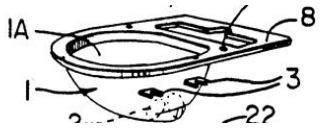

Figure 2: Excerpt from Figure 1 of the Kendall Patent. A portion of this figure illustrates the basin of a sanitary fixture, with that basin having "[f]langes **3** extending outwardly from the underside of the basin **1A** [that] may be provided for securing the basin to the supporting means . . . ." (Kendall Patent 5:17-19.) In this illustration, the flanges extend outward from the middle of the basin's sidewall, and not from the upper rim.

However, this determination does not end the dispute between the parties. Defendant seeks to limit the claim term "flange" to only a "rim," while Plaintiff argues that it encompasses a broad array of structures that could add support to the waste receptacle, specifically including out-turned edges and ribs. First, there is nothing in the claims, specification, and prosecution history directing addressing the definition of "flange." Furthermore, for the reasons discussed above, the Court declines to import any limitations from the preferred embodiment into the construction of the term "flange." Finally, the extrinsic evidence does not clearly support either parties' definition. For example, two of the three dictionaries cited by Defendant in support of its definition—the *Dictionary of Aviation* and *Webster's Dictionary*—include both edges and rims in their definition of flange. (Haber Decl., Ex. A, at 2, Ex. D, at 3.) On the other hand, only a single non-technical dictionary—the *American Heritage Dictionary*—defines flange to include a rib. (Cena Decl., Ex. E, at 3.) Thus, a person having ordinary skill in the art would understand "flange" to include rims and edges, but not ribs.

The final dispute between these parties is whether the flange must overlie the top of the support structure, or whether it must only be situated so that it transfers loads to the top of the support structure in some way. The claim language requires "a stationary frame support having a top with an opening therethrough, the waste receptacle including a sidewall sized for insertion into the opening and having an out-turned flange supported by the top of the support structure . . . ." ('942 Patent 11:1-7.) Thus, the flange must be supported by the top of the support structure, but there is no explicit requirement that the flange overlie the top of the support structure. The specification, by contrast, describes a preferred embodiment wherein "the out-turned flange **40** closely overlies the frame top member **28** so that the downward forces applied to the bowl **36** are transferred to the frame **20**." ('942 Patent 5:4-6.) In the preferred embodiment the out-turned flange overlies the top of the support frame. However, for the reasons discussed earlier, the Court will not import this limitation from the specification into the claim. To be supported by the top of the support structure, the flange need only transfer loads to it. The Court declines to read Defendant's more specific configuration into the claim language.

In sum, a person of ordinary skill in the art reading the claims in the context of the '942 Patent's specification would understand that the location of the out-turned flange is not limited to the upper edge of the waste bowl rim, but can extend outward from elsewhere on the sidewall. Furthermore, this person would also understand that the flange transfers loads to the support structure, but does not necessarily overlie the support structure. Finally, a person of ordinary skill in the art would understand "flange" to include rims and edges, but not ribs. The Court therefore adopts elements of both Plaintiff's and Defendant's proposed definitions and construes the phrase "out-turned flange supported by the top of the support structure" to mean "outside rim or edge turned away from the sidewall, transferring loads to the top of the support structure."

B. Line Replaceable Unit ("LRU")

Plaintiff's Proposal	Defendant's Proposal
A component, assembly, or subassembly which is removed and replaced as a single unit on an aircraft without requiring removal of the next higher assembly.[2]	A single module targeted for easy replacement in the field.

The disputed term "line replaceable unit" occurs in Claims 13, 14, and 17 of the '942 Patent ('942 Patent 11:17-23, 24-25, 31-34) and Claims 1 and 15 of the '055 Patent ('055 Patent 10:35-40, 11:32-41). Claim 13 of the '942 Patent describes a

> method of servicing a vacuum toilet . . . in which at least one of the discharge valve, rinse fluid valve, flush control unit, and waste receptacle is a line replaceable unit, the method comprising:

[2] At the *Markman* hearing, Plaintiff changed its proposed construction for the term "line replaceable unit" from "a component, assembly, or subassembly which **is** removed and replaced as a single unit on an aircraft without requiring removal of the next higher assembly" to "a component, assembly, or subassembly which **can be** removed and replaced as a single unit on an aircraft without requiring removal of the next higher assembly." (Markman Hr'g Tr., 68:11-19.) Plaintiff also submitted written notice of additional revisions to the Court more than two weeks after the *Markman* hearing, seeking the new construction "a module designed to be removed and replaced in the field without requiring removal of the entire vacuum toilet." (Notice of Revised Proposed Construction, ECF No. 65.) Defendant objected to both of Plaintiff's revisions as untimely. (Markman Hr'g Tr., 63:19-64:1; Def.'s Objection to Notice of Revised Proposed Construction, ECF No. 66.) The Court agrees with Defendant that both of Plaintiff's proposed constructions are untimely; however, to best resolve the parties' disputes, the Court has addressed some aspects of Plaintiff's proposals directly.

removing the faulty line replaceable unit from the toilet;
and installing a new line replaceable unit into the toilet.

('942 Patent 11:1, 17-24.) Claims 14 and 17 depend from Claim 13 and specify that the waste receptacle and valve set, respectively, are the line replaceable units. ('942 Patent 11:24-25, 31-34.) Claim 17 describes the valve set as including the discharge valve, rinse fluid valve, and flush control unit. ('942 Patent 11:31-34.) Claim 1 of the '055 Patent describes a "modular vacuum toilet" in which the toilet includes a "removable bowl supported by the support structure," which the claim defines as the first line replaceable unit, and a "valve set module defining a second line replaceable unit." ('055 Patent 10:9, 14-19.) In this claim, "the first line replaceable unit is independently replaceable from the toilet and the second line replaceable unit" and "the second line replaceable unit is independently replaceable from the toilet and the first line replaceable unit." ('055 Patent 10:35-40.) Claim 15 of the '055 Patent describes a method of servicing a modular vacuum toilet using similar language as Claim 1, with the valve set LRU requiring at least two of the discharge valve, rinse fluid valve, and flush control unit. ('055 Patent 11:31-34.)

The parties' proposed constructions of the phrase "line replaceable unit" differ in a number of ways. The Court begins with the first difference. Under Plaintiff's proposed construction, an LRU is a "component, assembly, or subassembly," while in Defendant's proposed construction, an LRU is a "single module." The structures that the claims describe as potential LRUs include the discharge valve, rinse fluid valve, flush control unit, and waste receptacle of a vacuum toilet, both independently and, for the two valves and the flush control unit, in combination as a valve set. ('942 Patent 11:17-24; '055 Patent 10:19-34, 11:31-34.) The specification's preferred embodiment teaches that the valve set and the waste receptacle can each be an LRU. ('942 Patent 5:34-35; 9:44-46.) The specification also explains that before the patented invention, the entire vacuum toilet was often defined as an LRU. ('942 Patent 1:44-45). Thus, a person of ordinary skill in the art would understand that an LRU could range in size and complexity from a single component (such as the waste receptacle of a toilet) or small unit (such as a valve or flush control unit) up to an entire toilet. Plaintiff argues that Defendant's proposed construction is incorrect because it "would allow a bolt or nail to qualify as an LRU." (Reply 3.) The use of the term module, however, is not so broad that it would include nails, screws, or other incidental fasteners. Furthermore, Plaintiff's objection to "module" is curious considering that a screw or bolt could also qualify as an LRU under Plaintiff's proposed construction, as such fasteners could often be "[a] component . . . which can be removed and replaced as a single unit on an aircraft without requiring removal of the next higher assembly." The term "module" addresses Plaintiff's concern better than does the term "component."

While Defendant's definition uses the phrase "single module," an embodiment of the invention could have multiple LRUs, some of which could be sub-modules of other LRUs. Thus, each module need not be a single structure. For example, the line replaceable units in one embodiment could include both the valve set and the individual discharge and rinse fluid valves making up that

valve set. While the specification does not specifically describe the discharge valve, rinse fluid valve, and flush control unit as LRUs, Claim 13 of the '942 Patent teaches that these components can be an LRU. ('942 Patent 11:17-24.) Thus, the Court's use of the phrase "single module" does not mandate that each module is a unitary structure or exclude the possibility of nested or overlapping LRU modules.

The parties also disputed the required location for LRU repair and replacement. Plaintiff's original proposed construction for the term "line replaceable unit" included the limiting phrase "which is removed and replaced . . . on an aircraft," while Defendant's construction states that an LRU is targeted for easy replacement "in the field." However, the claims are not limited to only those toilets that can be removed and replaced on an airplane. Furthermore, the specification covers vacuum toilets both on aircraft and in other applications, stating that "[v]acuum toilet systems are generally known in the art for use in both vehicle and stationary applications." ('942 Patent 1:9-10.) The specification also describes the preferred embodiment of the invention as "suitable for use in a vehicle." ('942 Patent 4:25-26.) The specification does state that, "[a]ccording to general practice in the airline industry," certain replaceable components "are commonly referred to as line replaceable units." ('942 Patent 1:39-43.) However, while an LRU can clearly include replaceable components on an airplane, the specification does not clearly express an intent to exclude components on other types of vehicles, even if those components are only used on other types of vehicles and are not usable on aircraft. Thus, Plaintiff's original proposed "on an aircraft" limitation is not supported by the specification or claims.

The Court is concerned that Defendant's use of the phrase "in the field" is unclear, and may create a secondary claim construction dispute. However, in its Brief, Defendant states that LRU replacement occurs "in line, or in the field, as opposed to, e.g., in the shop or factory." (Def.'s Br. 14.) This argument clarifies Defendant's intended construction for the term. Furthermore, at the *Markman* hearing counsel for Defendant stated that "in the field" means "the location where the toilet is installed," so, assuming the vacuum toilet is installed on a vehicle, it would mean "in the vehicle." (Markman Hr'g Tr., 77:20-23.) The Court agrees that an LRU is targeted for replacement where the toilet is installed, rather than in a repair facility or factory. Indeed, the '942 Patent teaches the distinction between "swapping in" a replacement LRU and the more involved "bench testing" performed to determine which components in the removed LRU have failed so they can be repaired or replaced. ('942 Patent 1:43-53.)

The third dispute concerns whether a line replaceable unit can be "removed and replaced as a single unit . . . without requiring removal of the next higher assembly," as Plaintiff contends, or is instead "targeted for easy replacement in the field," as Defendant contends. Plaintiff's proposed construction includes the phrase "without requiring removal of the next higher assembly." At the *Markman* hearing, Plaintiff clarified that in the context of the '942 and '055 Patents, this means "without requiring removal of the vacuum toilet." (Markman Hr'g Tr., 81:21-82:5.)

The claims and the specifications of the '942 Patent and the '055 Patent demonstrate that the focus of the patented invention is on the removal and replacement of vacuum toilet components from a vacuum toilet. Claims 1 and 15 of the '055 Patent specify that the waste receptacle LRU can be replaced independently of the toilet and the valve set LRU, and that the valve set LRU can be replaced independently of the toilet and the waste receptacle LRU. However, while this suggests that an LRU can be replaced without requiring the **replacement** of the toilet assembly, it does not necessarily mean that an LRU must always be capable of replacement without **removing** the toilet. By contrast, the preferred embodiment emphasizes that certain LRUs can be removed independently from the rest of the toilet. For example, it describes a toilet bowl that "is separable from the frame **20** and therefore may be replaced independently from the rest of the toilet." ('942 Patent 5:10-12, 34-35.) The specification further explains that "[t]he separate frame **20** advantageously allows the bowl **36** to be a line replaceable unit," because the "entire toilet need not be **removed** and serviced." ('942 Patent 5:34-35, 44-46 (emphasis added).) The specification also teaches that "the valve set **8** may be separately removed from the toilet **10**." ('942 Patent 9:59-60.) Thus, the patents teach the advantage of replacing an LRU without requiring the removal of the entire toilet.

However, the Court disagrees that a person having ordinary skill in the art would find that any unit that can be removed and replaced as a single unit without requiring the removal of the vacuum toilet qualifies as an LRU. For example, the Court doubts that person of ordinary skill in the art would consider a waste receptacle an LRU if it can only be removed and replaced from the vacuum toilet with a hacksaw and blowtorch, despite it qualifying under Plaintiff's proposed construction. Defendant's proposed construction, which defines LRUs as "single modules targeted for easy replacement in the field," better encapsulates the concept of a line replaceable unit. It is not only possible for an LRU valve set or waste bowl to be removed and replaced without requiring the removal of the vacuum toilet, but it must be something that can done **easily**.

Plaintiff argues that Defendant's construction is vague. However, the specification stresses that, before this invention, vacuum toilet maintenance was "time consuming and labor intensive." ('942 Patent 1:36-37.) Thus, a need existed for "a vacuum toilet that [was] easier to maintain." ('942 Patent 2:45-46.) Furthermore, the specification states that the valve set LRU is "quickly and easily removed and replaced." ('942 Patent 9:29-30.) The independent replacement of individual components allows for easy replacement in the field, as compared to the prior art, where the removal of these items could be time consuming and labor intensive. A fact finder, with the assistance of expert testimony, will be well-positioned to decide whether a module on a vacuum toilet can be removed and replaced easily, as compared to the prior art. This term is not vague. For these reasons, the Court construes the term "line replaceable unit" as "a single module targeted for easy replacement in the field."

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/ / /

C. Toollessly

Plaintiff's Proposal	Defendant's Proposal
Without the use of conventional mechanics' tools.	Without the use of any tools.

The disputed term "toollessly" occurs in independent Claims 1 and 10 of the '054 Patent ('054 Patent 4:65, 5:23) and dependent Claims 3 and 6 of the same patent ('054 Patent 5:5-6, 15-16). The parties dispute whether the term "toollessly" prohibits the use of any tools, or only conventional mechanics' tools, so that a repair made with a simple device not commonly thought of as a tool, such as a coin, could nonetheless infringe. (Markman Hr'g Tr., 89:19-24.)

The plain and ordinary meaning of the term "toollessly" is, of course, without tools. The term is used in the claims in a way that supports this interpretation. Claim 1 of the '054 Patent describes a waste receptacle that is "toollessly inserted into and removed from the installed position independent of the frame." ('054 Patent 4:65-67.) Claim 10 of the '054 Patent describes a method of "toollessly replacing a receptacle of a waste receptacle assembly used in a vacuum toilet system" that comprises lifting the receptacle from its frame and withdrawing it through the frame opening and inserting a new receptacle through the frame opening. ('054 Patent 5:23-24, 5:36-6:13.) Dependent Claim 3 of the '054 Patent describes an assembly containing a tab that "is toollessly releasable to disengage from the slot," and dependent Claim 6 describes an assembly containing a "rinse fluid dispenser adapted from toollessly releasable attachment to the rinse fluid pipe." ('054 Patent 5:5-6, 12-16.) Nothing about this language suggests that the repairs may occur with the use of unconventional mechanics' tools, conventional non-mechanics' tools, or indeed any tools at all.

The specification supports this interpretation of the term. The specification teaches that any tabs used to attach the bowl to the frame "may be manipulated manually, and therefore no tools are required to install or remove the bowl." ('054 Patent 4:7-8.) The specification also explains that the "bowl replacement process is not only fast, but does not require the use of any tools." ('054 Patent 4:37-38.) Furthermore, in distinguishing the invention from the prior art, the patentees stated that disconnecting vacuum toilet systems has traditionally been "overly difficult and time consuming," with each connection "requir[ing] a particular tool in order to loosen and disconnect." ('054 Patent 1:46-53.) The history of the '054 Patent is also relevant, as the applicants distinguished a prior art reference (Haber Decl., Ex. B, at 3, ECF No. 56-3), wherein the components were "bolted together" on the grounds that they would require "disassembly using tools." (Haber Decl., Ex. C, at 6, ECF No. 56-4.)

Despite the seemingly clear language in the claims, specification, and file history, Plaintiff argues that the term "toollessly" excludes only the use of conventional mechanics' tools, such as those typically used to remove fasteners and connect and disconnect electrical, water, and waste

connections from a vacuum toilet. Plaintiff bases this argument on the fact that the purpose of the invention is to facilitate the repair of vacuum toilets by mechanics. Plaintiff then relies on extrinsic evidence to list the types of tools that would qualify as conventional mechanics' tools. (Pl.'s Br. 11.) However, the claims and specification never describe the types of tools that could or could not be used to remove or install the toilet, nor does the patent make any reference to mechanics. Furthermore, that these toilets are typically repaired by mechanics does not compel the interpretation that the term "toollessly" is limited only to those tools commonly used by mechanics.

There is simply no intrinsic evidence supporting Plaintiff's construction; rather, the Court finds that the claims and the specification point wholly towards the interpretation that the phrase "toollessly" means "without the use of any tools."

D. Lifting the Receptacle . . . So That . . .

Plaintiff's Proposal	Defendant's Proposal
The claim term "lifting the receptacle" means "pulling in a generally upward direction on the receptacle." The rest of the phrase has its plain and ordinary meaning.	Pulling upward on the receptacle . . . to cause both . . .

The disputed phrase "lifting the receptacle . . . so that . . ." is found in Claim 10 of the '054 Patent. ('054 Patent 5:36-40.) The parties dispute whether the term "lifting" requires pulling in a "generally upward direction" or "pulling upward," and whether the phrase "so that" must be construed.

Claim 10 of the '054 Patent describes:

> A method of toollessly replacing a receptacle of a waste receptacle assembly . . ., the method comprising;
>
> **lifting the receptacle** while leaving the frame in place **so that** the abutting portion of the receptacle disengages from the receptacle receiving portion of the frame and the receptacle outlet disengages from the inlet coupling . . .

('942 Patent 5:23-24, 35-40.) Claim terms "are generally given their ordinary and customary meaning." *Phillips*, 415 F.3d at 1312. Here, the plain and ordinary meaning of the term "lifting" does not necessarily mean pulling perfectly straight upward or pulling only upward on an item, but includes pulling in a generally upward direction on the item, such that there may be some horizontal components to the action.

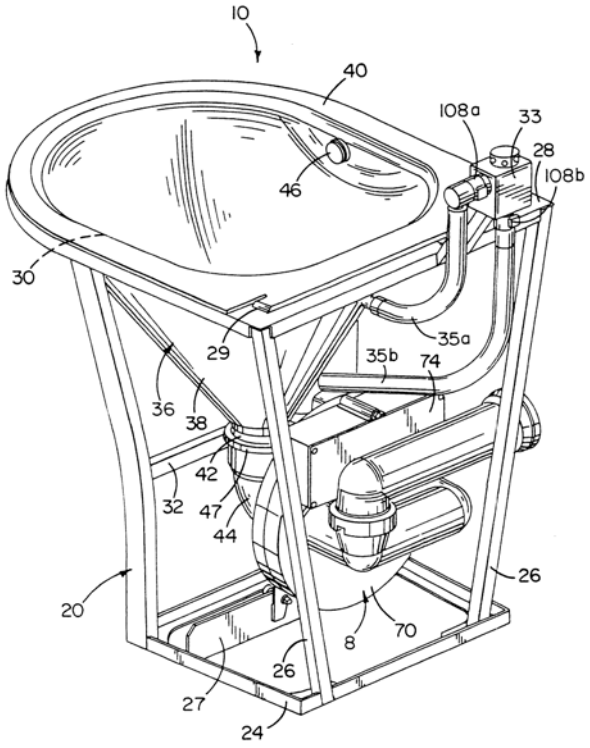

FIG. 1B

The specification teaches that the waste receptacle is removed by "pull[ing] upward on the bowl." ('054 Patent 4:31-32.) This pulling upward also disengages the receptacle from the frame (where, in this embodiment, it is connected by tabs that fit into slots in the frame) and the receptacle outlet from the inlet coupling (which, in this embodiment, connects the receptacle outlet to a waste pipe pointing directly upward). In this embodiment, the waste bowl must be lifted straight upward to disengage it from the frame and the inlet coupling. This is illustrated in the '054 Patent's figures 1A and 1B. Similarly, to install a new waste receptacle, the bowl "is lowered" directly downwards so that it engages with the support frame and so that the outlet is aligned with the inlet coupling. ('054 Patent 3:59-62.)

> **Figure 3: Figure 1B of the '054 Patent.** This figure illustrates the preferred embodiment of the '054 Patent, in which the bowl of a vacuum toilet can be pulled directly upward to disengage the waste bowl **36** from the support frame **20** and the waste receptacle outlet **42** from the inlet coupling **47**.

However, while lifting the waste receptacle in the preferred embodiment requires pulling directly upward on the bowl, limitations from the specification should not be imported into the claims. *See ICU Med.*, 558 F.3d at 1375; *Renishaw*, 158 F.3d at 1248. Adopting Defendant's proposed

construction because the preferred embodiment shows that lifting the bowl is done by pulling it directly upward, rather than generally upward, would be importing such a limitation from the specification into the claims. The Court thus adopts Plaintiff's proposed construction of the term "lifting the receptacle" and holds that it means "pulling in a generally upward direction on the receptacle." Under this construction, lifting may include a horizontal component, so long as the bowl is pulled in a generally upward direction.

The Court also agrees with Plaintiff that the phrase "so that" takes on its plain and ordinary meaning in the claim. However, the plain and ordinary meaning of the term "so that" requires a cause-and-effect relationship; that is, lifting the receptacle causes the receptacle to disengage from where it is supported by the frame and the receptacle outlet to disengage from the inlet coupling. Thus, the plain and ordinary meaning of the term captures the causal portion of Defendant's construction. The Court notes, however, that while lifting may include a horizontal component, horizontal movement alone cannot trigger the disengagement from the receptacle from the frame and the inlet coupling. Thus, the term requires the action of lifting generally upward—and not merely the horizontal component of this action—to trigger the disengagement.

III. RULING

For the foregoing reasons, the Court **CONSTRUES** the disputed claim terms as follows:

1. "Out turned flange supported by the top of the support structure": **Outside rim or edge turned away from the sidewall, transferring loads to the top of the support structure.**

2. "Line replaceable unit ('LRU')": **A single module targeted for easy replacement in the field.**

3. "Toollessly": **Without the use of any tools.**

4. "Lifting the receptacle . . . so that . . .": The claim term "lifting the receptacle" means "**pulling in a generally upward direction on the receptacle**." The rest of the phrase has its plain and ordinary meaning.

IT IS SO ORDERED.