AIR PURIFIER WITH HEPA FILTER AND UV DEVICE AND IMPROVED METHOD OF REMOVING AND DESTROYING CONTAMINANTS

Inventors: Cindy Rella, Cambridge, Ma.
Assignee: Wicked Clean Homes, Inc., Boston, Ma.
Appl. No.: 34,195
Filed: March 4, 2015
Date of Patent: August 26, 2015

FIELD OF THE INVENTION

The present invention relates to room air purifiers incorporating high-efficiency particulate air (HEPA) filters and ultra-violet (UV) light devices for use in removing air contaminants, as small as 0.1 microns, and sanitizing to destroy contaminants.

BACKGROUND OF THE INVENTION

Air purifiers offer the advantage of removing and destroying contaminants in the air. Contaminants include dust, pollen, bacteria, viruses, and mold. Although contaminants in the air are naturally occurring, they can aggravate people’s allergies if they inhale them and can potentially cause serious health problems. By removing or destroying the contaminants, air purifiers improve air quality by decreasing the concentration of particles in the air.

Air purifiers can be filters or sanitizers, or both. The most common type of room filters are HEPA filters. HEPA filters remove air contaminants by trapping particles in the fibers of the filters. Thus, filters improve indoor air quality by physically removing tiny particles of matter floating around the room, such as pollutants and allergens. The filters prevent contaminants from recirculating the room.

One drawback of HEPA filters is that current HEPA filters on the market can remove particles only as small as 0.3 microns in diameter; however, there are other contaminants that affect air quality, such as viruses, that can be as small as 0.1 microns.

The most common type of sanitizers are UV light devices. Hospitals and healthcare settings have utilized UV lights for sanitation for decades. UV light devices are designed to improve indoor air quality by destroying, not simply removing, contaminants, such as bacteria, viruses, or mold, by exposing them to UV light. UV light destroys the molecular bonds that hold together the DNA of contaminants.

One drawback of UV light devices is that this broad spectrum light can also be a health hazard. Recently, researchers have been working with narrow spectrum UV light that is safe to use while humans are in the room.

SUMMARY OF THE INVENTION

Unless otherwise defined all technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art to which this invention belongs.

The present invention was developed in response to the problems and needs in the art that have not yet been fully solved by currently available air purifiers. The present invention has been developed to provide an air purifier that includes a HEPA filter to remove pollutants and allergens as small as 0.1 microns and a UV device to destroy contaminants, such as bacteria, viruses, and mold, including the coronavirus.

DETAILED DESCRIPTION

The invention includes an air purifier device that incorporates HEPA filters and a UV light.

The HEPA filters in the air purifier can remove particles, such as pollutants and allergens, from the air as small as 0.1 microns.

The UV light has narrow-spectrum UVC rays (207-222 nanometers). The UV light can be safely used while humans are in the room. The UV light destroys contaminants in the air, including bacteria, viruses, and mold.

The device also includes an air quality monitor that measures the particle matter (PM) in the air. The air quality monitor can measure PM as small as 0.1 microns. The air quality monitor presents its measurements via a smartphone application or Bluetooth-enabled device. The application stores the air quality data. A user can preselect the size of PM to monitor. A user can also preselect how often the device will measure the air quality and the size of the area that the device will monitor. A user can, further, enable push notifications to allow the device to notify the user when air quality is within a certain predefined range.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are illustrated by way of example and are not intended to be limited in the accompanying figures.

FIG 1. is a diagram of an preferred embodiment of the device.

FIG 2. is a flowchart of a method of the air purifiers’ use.
What is claimed is:

1. An air purifier device having stored thereon computer-executable instructions for detecting the concentration of particle matter, having a characteristic with a predetermined value, in a predefined area using particle matter measurements received from the air quality monitor performing the steps of:
   a. a user inputting a numerical value to define desired particle matter size to monitor within the predefined area of interest;
   b. detecting the concentration of particle matter to determine the air quality;
   c. determining if the air quality is within a predefined tolerance of the predetermined value of the desired air quality;
   d. generating an indication of the air quality having the value of the particle matter concentration within the predefined tolerance.

2. The air purifier device of claim 1 wherein said device includes a high-efficiency particulate air filter that removes particles from the air as small as 0.1 microns.

3. The air purifier device of claim 1 wherein said device includes an ultra-violet light with narrow spectrum rays within 207 and 222 nanometers that destroys particles in the air as small as 0.1 microns.

4. The air purifier device of claim 2 wherein said device filters pollutants and allergens.

5. The air purifier device of claim 3 wherein said device destroys bacteria, viruses, and mold.

6. The air purifier device of claim 1 wherein said device connects to a smartphone application or a Bluetooth-enabled device.
User selects the following on their smartphone application or Bluetooth-enabled device:

- Particle size to monitor (e.g. particles as small as 0.1 microns)
- Area to monitor (e.g. 600 square feet surrounding the device)
- Frequency of monitoring (e.g. every thirty minutes)
- Desired air quality level (i.e. desired particle matter concentration)

If air quality level is above desired particle matter concentration, the user will receive a notification.

**FIG. 1**

**FIG. 2**

Appx003
UNITED STATES PATENT AND TRADEMARK OFFICE
------------------------------------------
BEFORE THE PATENT TRIAL AND APPEAL BOARD
------------------------------------------

Midnight, Inc.
Petitioner,
v.
Wicked Clean Homes, Inc.
Patent Owner.

-----------
Case IPR2021-GSR
Patent GSR,826,022


MIGOS, Administrative Patent Judge.

DECISION
Instituting Inter Partes Review
35 U.S.C. § 314
I. INTRODUCTION


We have jurisdiction under 35 U.S.C. § 314. Under § 314, an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). The Board determines whether to institute a trial on behalf of the Director. 37 C.F.R. § 42.4(a). If an *inter partes* review is instituted, a final written decision under 35 U.S.C. § 318(a) must decide the patentability of all claims challenged in the petition. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018).

For the reasons set forth below, upon considering the Petition, Preliminary Response, and the evidence of record, we determine that Petitioner has shown a reasonable likelihood that it would prevail with respect to at least one of the challenged claims. Accordingly, we institute an *inter partes* review of all the challenged claims on the asserted grounds.
II. RELATED PROCEEDINGS

Petitioner identifies one related proceeding:


III. PETITION

Petitioner challenges claims 1–6 of the ’022 Patent under 35 U.S.C. § 103 on the following grounds:

<table>
<thead>
<tr>
<th>Claims Challenged</th>
<th>35 U.S.C. §</th>
<th>Reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–6</td>
<td>103</td>
<td>Clean Air 5ever Instruction Manual</td>
</tr>
</tbody>
</table>

We institute a trial on all challenged claims and on the asserted grounds.

IV. THE ’022 PATENT

The ’022 Patent is directed to room air purifiers “incorporating high-efficiency particulate air (HEPA) filers and ultra-violet (UV) light devices for use in removing air contaminants, as small as 0.1 microns, and sanitizing to destroy contaminants.” ’022 Patent, Abstract.

According to the disclosure of the ’022 Patent, air purifiers can be filters or sanitizers, or both, and the most common types of room filters and sanitizers are HEPA filters and UV light devices, respectively. HEPA filters work to remove air...
contaminants by trapping the particles in the fibers of the filter material and thus, preventing the recirculation of the contaminants into the air. UV light destroys the molecular bonds of the air contaminants, breaking down those particles to improve the air quality.

The purported problem solved by the ’022 Patent is that prior HEPA filters were not designed to filter out particles smaller than 0.3 microns. UV light, in addition, cannot be used while humans are in the room. Thus, to more efficiently and effectively destroy other air contaminants such as bacteria, viruses, and mold, the applicant for the ’022 Patent designed the claimed air purifier to “remove pollutants and allergens that are as small as 0.1 microns.”

V. LEVEL OF SKILL IN THE ART

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. Okajima v. Bourdeau, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“the level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention”).

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology, and (6) educational level of workers active in the field. Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, Appx007
Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. Ltd, Inc. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355. Additionally, the Supreme Court informs us that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Telex, Inc.*, 550 U.S. 398, 421 (2007).

For purposes of this Decision, we determine that a person of ordinary skill in a technology pertinent to the challenged claims would have had a Bachelor’s degree in mechanical engineering and/or electrical engineering and at least 2 years of experience working with air purifier technology.

**VI. UNPATENTABILITY**

**a. Legal Principles**

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person
having ordinary skill in the art to which said subject matter pertains.” KSR, 550 U.S. at 406.

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others. Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966); see KSR, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”). The Court in Graham explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context.” 383 U.S. at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. KSR, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. Id. at 417. To reach this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. Unigene
Labs., Inc. v. Apotex, Inc., 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” Id.; see also Orexo AB v. Actavis Elizabeth LLC, 903 F.3d 1265, 1273 (Fed. Cir. 2018) (“The question is not whether the various references separately taught components of the ’330 Patent formulation, but whether the prior art suggested the selection and combination achieved by the ’330 inventors.”).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Litton Indus. Prods., Inc. v. Solid State Sys. Corp., 755 F. 2d 158, 164 (Fed. Cir. 1985) (“It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness.” (citation omitted)); see also Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1537 (Fed. Cir. 1983).

“A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect.” EWP Corp. v. Reliance Universal Inc., 755 F.2d 898, 907 (Fed. Cir. 1985).
A patent can be obvious in light of a single reference if it would have been obvious to modify that reference in a way that results in the patented invention. See *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) (“Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.”).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.” *KSR*, 550 U.S. at 421. This does not deny us, however, “recourse to common sense” or to that which the prior art teaches. *Id.*

We address the bases of unpatentability under § 103 asserted by Petitioner.

**b. Claims 1–6 based on the CleanAir 5ever Instruction Manual**

Petitioner asserts that claims 1–6 of the '022 Patent would have been obvious under 35 U.S.C. § 103 based on the Clean Air 5ever Instruction Manual.

Patent Owner asserts that for the asserted grounds of unpatentability at least one claim element is missing from the Clean Air 5ever Instruction Manual. According to Patent Owner, the Petition should be denied at least because the Clean Air 5ever Instruction Manual does not disclose “[a]n air purifier device having stored thereon computer-executable instructions for detecting the concentration of particle matter” as recited in challenged claim 1, upon which all other challenged claims
depend. Patent Owner also contends that the Petition should be denied because the
Clean Air 5ever Instruction Manual does not disclose “a high-efficiency particulate
air filter that removes particles from the air as small as 0.1 microns” as recited in
challenged claim 2.

The Clean Air 5ever Instruction Manual was published on March 1, 2014. This is more than one year before the March 4, 2015, priority date of the challenged claims. Thus, the Clean Air 5ever Instruction Manual is available as a reference under 35 U.S.C. § 102(a) and (b).

The Clean Air 5ever Instruction Manual concerns a system of air filtration for HVAC systems. In general, the system described in the Clean Air 5ever Instruction Manual improves the efficacy of air filtration in the HVAC systems of homeowners.

The Clean Air 5ever Instruction Manual describes an HVAC system that provides measurements of the air quality in the household and status of the condition or concentration of air particles contained in the filter material. Figure 2 of the Clean Air 5ever Instruction Manual illustrates one possible configuration of the air filtration method. The system shown in Figure 2 includes an image of the filtration material that is installed in the HVAC system and a cross-hatch pattern used to trap the particles of air contaminants. The cross-hatch pattern improves the HVAC’s system’s ability to capture smaller pollutants or any bacteria that cycles through the HVAC system.
Based on the evidence before us at this stage of the proceeding, we find Petitioner’s analysis persuasive, and we agree with Petitioner that there is a reasonable likelihood that claims 1–6 of the ’022 Patent would have been obvious to a person of ordinary skill in the art based on the Clean Air Sever Instruction Manual.

**VII. CONCLUSION**

Based on the analysis of the arguments and evidence in the Petition, we determine that Petitioner has shown a reasonable likelihood that it would prevail in establishing unpatentability of at least one claim. Accordingly, we institute a trial of all the challenged claims on the asserted grounds.

This is a decision to institute an *inter partes* review under 35 U.S.C. § 314. Our factual findings and determinations at this stage of the proceeding are preliminary, and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Our final decision will be based on the record as fully developed during trial.
UNIVERSAL STATES PATENT AND TRADEMARK OFFICE
-----------------------------------------
BEFORE THE PATENT TRIAL AND APPEAL BOARD
-----------------------------------------
Midnight, Inc.
Petitioner,
v.
Wicked Clean Homes, Inc.
Patent Owner.

--------------
Case IPR2021-GSR
Patent GSR,826,022


MIGOS, Administrative Patent Judge.

JUDGEMENT

Final Written Decision
35 U.S.C. § 318(a)
I. INTRODUCTION

Midnight, Inc. ("Petitioner") filed a Petition to institute an *inter partes* review of claims 1–6 (the “challenged claims”) of U.S. Patent GSR,826,022 (the “’022 Patent”). Wicked Clean Homes, Inc. ("Patent Owner") filed a Preliminary Response.

We concluded that Petitioner satisfied its burden under 35 U.S.C. § 314(a) to show that there was a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, on behalf of the Director (37 C.F.R. § 42.4(a)), and in accordance with SAS Inst., Inc. v. Iancu, 138 S. Ct. 1348, 1353 (2018), we instituted an *inter partes* review of all the challenged claims on the asserted grounds. Paper 5 (Institution Decision).


We have jurisdiction under 35 U.S.C. § 6. We enter this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has the burden of proving unpatentability of a claim by a preponderance of the evidence. 35 U.S.C. § 316(e).

Based on the findings and conclusions below, we determine that Petitioner has not proven that claims 1–6 of the ’022 Patent are unpatentable.
II. RELATED PROCEEDINGS

Petitioner identifies one related proceeding:


III. THE ’022 PATENT

The ’022 Patent is directed to room air purifiers “incorporating high-efficiency particulate air (HEPA) filters and ultra-violet (UV) light devices for use in removing air contaminants, as small as 0.1 microns, and sanitizing to destroy contaminants.” ’022 Patent, Abstract.

According to the disclosure of the ’022 Patent, air purifiers can be filters or sanitizers, or both, and the most common types of room filters and sanitizers are HEPA filters and UV light devices, respectively. HEPA filters work to remove air contaminants by trapping the particles in the fibers of the filter material and thus, preventing the recirculation of the contaminants into the air. UV light destroys the molecular bonds of the air contaminants, breaking down those particles to improve the air quality.

The purported problem solved by the ’022 Patent is that prior HEPA filters were not designed to filter out particles smaller than 0.3 microns. UV light, in addition, cannot be used while humans are in the room. Thus, to more efficiently
and effectively destroy other air contaminants such as bacteria, viruses, and mold, the applicant for the ’022 Patent designed the claimed air purifier to “remove pollutants and allergens that are as small as 0.1 microns.”

IV. UNPATENTABILITY

a. Legal Principles

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); see *KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”). The Court in *Graham* explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious
is not a question upon which there is likely to be uniformity of thought in every given factual context.” 383 U.S. at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. KSR, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. Id. at 417. To reach this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. Unigene Labs., Inc. v. Apotex, Inc., 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” Id.; see also Orexo AB v. Actavis Elizabeth LLC, 903 F.3d 1265, 1273 (Fed. Cir. 2018) (“The question is not whether the various references separately taught components of the ’330 Patent formulation, but whether the prior art suggested the selection and combination achieved by the ’330 inventors.”).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been
obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F. 2d 158, 164 (Fed. Cir. 1985) (“It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness.” (citation omitted)); see also *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983).

“A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect.” *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985).

A patent can be obvious in light of a single reference if it would have been obvious to modify that reference in a way that results in the patented invention. See *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) (“Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.”).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.” *KSR*, 550 U.S. at 421. This does not deny us, however, “recourse to common sense” or to that which the prior art teaches. *Id.*

We address the bases of unpatentability under § 103 asserted by Petitioner.
b. **Ground 1 based on the Clean Air 5ever Instruction Manual**

We make the following findings concerning the disclosure of the Clean Air 5ever Instruction Manual.

The Clean Air 5ever Instruction Manual was published on March 1, 2014. This is more than one year before the March 4, 2015, priority date of the challenged claims. Thus, the Clean Air 5ever Instruction Manual is available as a reference under 35 U.S.C. § 102(a) and (b).

The Clean Air 5ever Instruction Manual concerns a system of air filtration for HVAC systems. In general, the system described in the Clean Air 5ever Instruction Manual improves the efficacy of air filtration in the HVAC systems of homeowners.

The Clean Air 5ever Instruction Manual describes an HVAC system that provides measurements of the air quality in the household and status of the condition or concentration of air particles contained in the filter material. Figure 2 of the Clean Air 5ever Instruction Manual illustrates one possible configuration of the air filtration method. The system shown in Figure 2 includes an image of the filtration material that is installed in the HVAC system and a cross-hatch pattern used to trap the particles of air contaminants. The cross-hatch pattern improves the HVAC’s system’s ability to capture smaller pollutants or any bacteria that cycles through the HVAC system.
i. “An air purifier device having stored thereon computer-executable instructions for detecting the concentration of particle matter”

Claim 1 of the ’022 Patent claims “[a]n air purifier device having stored thereon computer-executable instructions for detecting the concentration of particle matter.” Petitioner argues that the Clean Air 5ever Instruction Manual renders this limitation obvious because it discloses an HVAC system connected to a thermostat via WiFi, LAN, WLAN, or any other network that stores computer executable instructions. These computer executable instructions take user input, such as temperature set-points, preferred start/end times for heating/cooling cycles, and HVAC system modes, and calculate the optimal operation of the HVAC system in the user’s household. Various algorithms are executed to continually ensure that the HVAC system is in good condition and the household is well ventilated and maintained, including the detection of the concentration of particle matter and the current capacity and state of the filter material.

Patent Owner argues that the Clean Air 5ever Instruction Manual does not disclose this limitation because the thermostat is a separate, independent device from the filtration system itself. The ’022 Patent discloses that the air purifier system device itself stores the computer executable instructions; there is no other device that the air purifier is connected to for the storage and performance of the computer executable instructions.
Moreover, Patent Owner argues that although the Clean Air 5ever Instruction Manual may provide measurements of the concentration of particle matter and the current conditions of the filter, it does not provide measurements of the air quality. Patent Owner states that the Clean Air 5ever Instruction Manual merely provides a passive status update of the filter and the particles trapped, rather than calculating the condition of the air quality. Petitioner, in turn, states that the condition of the filter and concentration of the particle matter are measurements that provide indications of the air quality in a household.

We agree with Patent Owner. Measurements of different aspects or components of air quality are not measurements of air quality. Thus, we find that Petitioner has not met it burden of proving by a preponderance of the evidence that the Clean Air 5ever Instruction Manual renders claim 1 of the '022 Patent obvious.

ii. “a high-efficiency particulate air filter that removes particles from the air as small as 0.1 microns”

Claim 2 of the ’022 Patent claims an air purifier device that “includes a high efficiency particulate air filter that removes particles from the air as small as 0.1 microns.” Petitioner argues that the Clean Air 5ever Instruction Manual renders this limitation obvious because it provides for an HVAC filtration material with a cross-hatch pattern that can filter “smaller pollutants and bacteria to improve the cleanliness of air in the HVAC system.” The Clean Air 5ever Instruction Manual
further provides that the filtration material can “for example, filter out bacteria and pollutants that are as small as 0.3 microns” and as such, it can also be used to filter out almost all viruses and bacteria that may be present in a household’s HVAC system. Petitioner argues that a person of ordinary skill in the art (POSITA) would have understood that such filtration material could have been modified easily to further capture air pollutants that were as small as 0.1 microns.

Patent Owner argues that the Clean Air 5ever Instruction Manual does not render the limitation “a high-efficiency particulate air filter that removes particles from the air as small as 0.1 microns” obvious. Patent Owner argues that the Clean Air 5ever Instruction Manual describes filtering pollutants “as small as 0.3 microns,” and does not provide for filtration of any air contaminants smaller than 0.3 microns. Patent Owner argues that a POSITA would not have understood from the Clean Air 5ever Instruction Manual how to modify the filtration material in that system to capture air pollutants smaller than 0.3 microns and as small as 0.1 microns.

We agree with Patent Owner that a POSITA would not have understood how to modify the filtration material described in the Clean Air 5ever Instruction Manual to capture air pollutants as small as 0.1 microns. Thus, we find that Petitioner has not met it burden of proving by a preponderance of the evidence that the Clean Air 5ever Instruction Manual renders claim 2 of the ’022 Patent obvious.
V. CONCLUSION

Based on the analysis of the arguments and evidence in the Petition, Preliminary Response, Response, Reply, and Sur-Reply, we hold that Petitioner has not shown by a preponderance of the evidence that claims 1–6 of the ’022 Patent are unpatentable based on the Clean Air 5ever Instruction Manual.
ROSE FRANK, having been duly sworn, testified as follows:

EXAMINATION

*** LINES OMITTED ***

BY MS. JONES:

Q: You are here today because you opined on whether the '022 patent is invalid for indefiniteness, correct?
A: Yes.

Q: Did you come to any conclusion about whether the '022 patent is indefinite?
A: Yes.

Q: What was your conclusion?
A: The patent is valid and not indefinite.

Q: How did you come to that conclusion?
A: I analyzed whether a person who is skilled in the art would consider the claims a method claim, an apparatus claim, or mixed.

Q: How would you define a person who is skilled in the art?
A: A college graduate with a Bachelor’s in Computer Science and a few years of experience in the field.

Q: How would a person who is skilled in the art interpret these claims?
A: They would understand that the patent claims the apparatus and any functional language is merely what the apparatus is capable of.

Q: Was it a close call?
A: I don’t understand what you mean by that.

Q: Let me rephrase, could any of the claims of the '022 patent confuse a person who is skilled in the art, even slightly, into thinking a claim is claiming a method.
A: No.

Q: Could any of the claims of the ’022 patent be understood to claim a user action?

A: No.

Q: Okay, what about claim 1 of the ’022 patent?

A: What exactly is the question?

Q: Claim 1 claims that a user has to input a value into the apparatus, could a person who is skilled in the art understand that as claiming a user function?

A: I don’t believe so. A person who is skilled in the art would understand that the user input is merely a function that the device is capable of.

Q: So, in terms of infringement, can a competitor device on its own, without user input, infringe the ’022 patent?

A: Yes.

Q: But, the claim requires user input?

A: It doesn’t require user input, rather the device is capable of receiving user input.

Q: Sure, but without user input, the particle size could not be determined?

A: Yes, but the claims aren’t claiming that action and a person who is skilled would understand that this is a function that the device is capable of.

Q: What would happen if a user didn’t input a value?

A: I am not sure.

Q: Why not?

A: I haven’t examined the device.

Q: Are you saying you did not physically examine the device?

A: Correct.

Q: Why not?

A: I was only asked to interpret the claims.

Q: How much are you getting paid to do this?
A: My regular rate of $650 an hour, I did 12 hours of research, and my time for today would be around $13,000.

Q: And you didn’t examine the device itself?

MS. SMITH: Objection, asked and answered.

BY MS. JONES:

Q: You can answer.

A: I didn’t need to.

*** LINES OMITTED ***
WYATT CRICK, having been duly sworn, testified as follows:

EXAMINATION

*** LINES OMITTED ***

BY MS. SMITH:

Q: In your expert report you gave an opinion about whether IPR estoppel should apply correct?
A: Yes

Q: What is your opinion?
A: I don’t think IPR estoppel should apply.

Q: Why is that?
A: Because the prior art system at issue, in this case, is not similar to the documents raised in the IPR.

Q: What materials did you rely on to come to that conclusion?
A: My years of expertise in the field, as well as the prior art system in this case and the IPR documents.

Q: When you say the IPR documents, what are you referring to?
A: The Clean Air 5Ever Instruction Manual, it’s a public document.

Q: When you say the prior art system in this case, what are you referring to?
A: The Clean Air 5Ever device.

Q: To be clear, you relied on the Clean Air 5Ever air purifier and its instruction manual?
A: Yes.

Q: And it is your opinion that IPR estoppel should not apply?
A: Yes.

Q: Why do you believe that?
A: Well, it’s rather simple. The manual was raised in the IPR. The system itself was not.
Q: How did you perform the analysis that brought you to that conclusion?
A: Again, it was simple. There was hardly any analysis at all. One was raised, the other was not. Simple.
Q: Describe how you used both the system and the manual in coming to your conclusion?
A: I first started with the device disclosed in this case, but I couldn’t understand exactly how it worked, so then I analyzed the manual disclosed in the IPR. This led to a better understanding of the device. I then looked through the documents and device disclosed at the IPR and saw that the manual was disclosed while the device itself was not.
Q: You did not understand how the system worked?
A: At first.
Q: So, are you saying that the instruction manual raised at the IPR helped you understand how the system works?
A: Yes.
Q: Without the instruction manual, would you have been able to understand how the Clean Air 5Ever air purifier system worked?
A: I don’t know the answer to that. Perhaps. But I did have the instruction manual so there would be no way of knowing.
Q: Can you just imagine for a minute what it would have been like without the instruction manual?
A: No.
Q: Okay Dr. Crick, when you were comparing the two -- the instruction manual and the air purifier system -- is it fair to say that without the Clean Air 5Ever instruction manual it would have been more difficult for you to understand the Clean Air 5Ever system?
A: I guess that’s fair.
EXAMINATION

BY MS. JONES:

Q: Dr. Crick, the Clean Air 5Ever device is separate from the Clean Air 5Ever manual right?
A: Right, in the sense that they are not attached to each other.

Q: Is it fair to say that Clean Air 5Ever manual cannot be compared to the Clean Air 5Ever system?
A: I don’t agree with that, it’s the manual for the system so it can be compared. It tells you how to use the device.

Q: But they aren’t the same?
A: No the manual is not the same thing as the device.

Q: If you have one, you wouldn’t need the other?
A: I don’t understand the question

Q: Let’s say, you have the Clean Air 5Ever device, would you need the manual along with it?
A: I think I already answered this question, I had the manual with me so I can’t tell you whether it was necessary or not. I used it to understand the device without having to spend time trying to figure it out on my own.

Q: But could you have figured it out on your own?
A: Again, I don’t know. I didn’t need to.
IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF GILESEAD

Wicked Clean Homes, Inc.
Plaintiff,
v.
Midnight, Inc.
Defendant.

Civil Action No. 2021-GSR

MEMORANDUM ORDER GRANTING DEFENDANT’S
MOTION FOR SUMMARY JUDGMENT

I. INTRODUCTION

This is a patent infringement suit between Plaintiff Wicked Clean Homes, Inc. (“Wicked Clean”) and Defendant Midnight, Inc. (“Midnight”). The patent-in-suit is U.S. Patent GSR,826,022 (the “’022 patent”), which is directed to air purifiers. This order addresses Midnight’s motion for summary judgment of invalidity, Wicked Clean’s motion for summary judgment of infringement, and Wicked Clean’s motion regarding inter partes review (IPR) estoppel.

II. FACTUAL BACKGROUND

The ’022 patent, which issued on August 26, 2015 and is assigned to Wicked Clean, is directed to room air purifiers incorporating high-efficiency particulate air (HEPA) filters and ultra-violet (UV) light devices for use in removing air contaminants as small as 0.1 microns and sanitizing to destroy contaminants including viruses and bacteria. Claims 1–6 of the ’022 patent...
recite an air purifier device performing certain steps including, *inter alia*, detecting the concentration of particle matter to determine air quality.

Claim 1 (the sole independent claim) is representative:

1. An air purifier device having stored thereon computer-executable instructions for detecting the concentration of particle matter, having a characteristic with a predetermined value, in a predefined area using particle matter measurements received from the air quality monitor performing the steps of:
   a. a user inputting a numerical value to define desired particle matter size to monitor within the predefined area of interest;
   b. detecting the concentration of particle matter to determine the air quality;
   c. determining if the air quality is within a predefined tolerance of the predetermined value of the desired air quality;
   d. generating an indication of the air quality having the value of the particle matter.

Wicked Clean manufactures and sells an air purifier called “Wicked Clean Air.” Wicked Clean Air includes a HEPA filter that removes air contaminants as small as 0.1 microns and a UV light that destroys contaminants including viruses and bacteria. Wicked Clean Air is controllable via a smartphone application and capable of detecting changes in air quality, carbon monoxide, radon, dust, humidity, temperature, and total volatile organic compounds.

Wicked Clean accuses Midnight’s air purifier called “Midnight Pure” of infringing claims 1–6 of the ’022 patent. Midnight Pure is compatible with a smartphone application and detects airborne particles and air quality, and it uses a HEPA filter to remove air contaminants as small as 0.3 microns.
III. PROCEDURAL BACKGROUND

On January 4, 2021, Wicked Clean filed a complaint accusing Midnight Pure of infringing claims 1–6 of the ’022 patent. On February 1, 2021, Midnight filed a petition for *inter partes* review (IPR) at the Patent Trial and Appeal Board (PTAB) on the grounds that claims 1–6 of the ’022 patent are obvious in view of the Clean Air 5ever Instruction Manual. On March 1, 2021, the PTAB instituted the IPR. The following day, Midnight filed a motion to stay this case pending the outcome of the IPR, which this Court granted. On July 12, 2021, the PTAB issued a Final Written Decision (FWD)\(^1\), finding that Midnight had not shown by a preponderance of the evidence that claims 1–6 of the ’022 patent are unpatentable based on the Clean Air 5ever Instruction Manual.

On January 3, 2022, both parties moved for summary judgment under Federal Rule of Civil Procedure 56. Wicked Clean moved for summary judgment of infringement and filed a motion regarding IPR estoppel, arguing that Midnight should be estopped under 35 U.S.C. § 315(e)(2) from asserting an invalidity defense based on the Clean Air 5ever air purifier system because it relied on the Clean Air 5ever Instruction Manual in the IPR proceedings. Midnight moved for summary judgment of invalidity, arguing that claim 1 of the ’022 patent is indefinite under *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377 (Fed. Cir. 2005) and its progeny because it claims both an apparatus and a method for its use, and that claims 1–6 of the ’022 patent are invalid as obvious in view of the Clean Air 5ever air purifier system.

The Court finds that claim 1 of the ’022 patent is indefinite. Having concluded that the ’022 patent is invalid for indefiniteness, the Court need not address infringement or obviousness,

---

\(^1\) Midnight has not appealed the PTAB’s decision, and the Supreme Court’s decisions in U.S. *v. Arthrex, Inc.* (19-1434); *Smith & Nephew, Inc. v. Arthrex, Inc.* (19-1452); and *Arthrex, Inc. v. Smith & Nephew, Inc.* (19-1458) are not at issue in this case.
as these issues are moot. Given the strength of the parties’ arguments with respect to the IPR estoppel issue, however, the Court addresses Wicked Clean’s motion regarding IPR estoppel and finds that Midnight is not estopped from relying on the Clean Air 5ever air purifier system.

IV. LEGAL STANDARD

Summary judgment should be granted only where the Court, viewing the evidence in the light most favorable to the non-moving party, determines that no genuine dispute of material fact exists. See Fed. R. Civ. P. 56. A dispute is genuine if it “may reasonably be resolved in favor of either party.” Cadle Co. v. Hayes, 116 F.3d 957, 960 (1st Cir. 1997). Facts are “material” if they possess “the capacity to sway the outcome of litigation under the applicable law.” Id. The facts in genuine dispute must be significantly probative in order for summary judgment to be denied; “conclusory allegations, improbable inferences, and unsupported speculation will not suffice.” Id. Moreover, “[t]he standards are the same where . . . both parties have moved for summary judgment.” Bienkowski v. Northeastern Univ., 285 F.3d 138, 140 (1st Cir. 2002).

V. DISCUSSION

A. Indefiniteness

An issued patent is presumed valid and, therefore, invalidity must be proven by clear and convincing evidence. 35 U.S.C. § 282; Metabolite Labs., Inc. v. Laboratory Corp. of America Holdings, 370 F.3d 1354, 1365 (Fed. Cir. 2004). “A claim is considered indefinite if it does not reasonably apprise those skilled in the art of its scope.” IPXL, 430 F.3d at 1384. Indefiniteness is a question of law. Id.

The issue before the Court is whether claim 1 of the ’022 patent improperly claims both an apparatus and a method for its use, rendering the claim indefinite. Midnight argues that claim 1 is indefinite under the Federal Circuit’s decision in IPXL Holdings, L.L.C. v. Amazon.com, Inc. and its progeny because it is unclear to a person of ordinary skill in the art (POSITA) “whether
infringement . . . occurs when one creates a system that allows” a user inputting a numerical value
to define desired particle matter size, or whether infringement occurs when the system receives the
numerical value to define desired particle matter size and “actually uses” it. 430 F.3d at 1384; see
’022 patent at 3:2–11. Midnight further argues that the IPXl line of cases show that an apparatus
claim that requires activities by a user, such as claim 1 of the ’022 patent here, is a clear indicator
of an invalid mixed method-apparatus claim. See, e.g., In re Katz, 639 F.3d 1303, 1318 (Fed. Cir.
2015).

Wicked Clean argues that claim 1 of the ’022 patent is not indefinite because recent Federal
Circuit cases have narrowed IPXl. See, e.g., Mastermine Software, Inc. v. Microsoft Corp., 874
F.3d 1307, 1316 (Fed. Cir. 2017); see also Targus Int’l LLC v. Victorinox Swiss Army, Inc., No.
is narrow.”). Wicked Clean argues that a POSITA would understand that claim 1 merely uses
functional language to describe the capabilities of the claimed apparatus, and that infringement
does not require actual performance of any steps, either by a user or by the apparatus itself. Put
another way, Wicked Clean contends that a POSITA would understand that the apparatus is limited
to functions that the computer-executable instructions are capable of performing. See ’022 patent
at 3:2–8 (“An air purifier device having stored thereon computer executable instructions for . . .
performing the steps of”) (emphasis added). In support, Wicked Clean cites Mastermine Software,
Inc. v. Microsoft Corp. and argues that claim 1 of the ’022 patent is distinguishable from those at
issue in IPXl and Katz, because the claim here “do[es] not claim activities performed by the user.
While [claim 1 of the ’022 patent] make[s] reference to user selection, [claim 1] do[es] not
explicitly claim the user’s act of selection, but rather, claim[s] the system’s capability to receive
and respond to user selection.” MasterMine, 874 F.3d at 1316. Wicked Clean thus contends that
because claim 1 does not specifically require a user of the recited system to take specific action, the claim is not indefinite. See *M2M Solutions LLC v. Sierra Wireless Am., Inc.*, No. 12-30-RGA, 2016 WL 1298961, at *5 (D. Del. Mar. 31, 2016) (“[T]he *IPXL* line of cases did not support Defendants’ argument, because the claim language at issue in the [] patent does not specifically ‘require the user of the recited system to take specific action.’”).

Midnight in turn argues that this case is more akin to *H-W Technology, L.C. v. Overstock.com, Inc.*, 758 F.3d 1329, 1336 (Fed. Cir. 2014). Midnight argues that, similar to *H-W Technology*, the language in claim 1 of the ’022 patent makes it unclear to a POSITA where the infringement would occur: when there is an apparatus capable of performing “a user inputting,” “detecting,” “determining,” and “generating,” or when the device actually performs these steps? Further, Midnight contends that although the *IPXL* line of cases does not turn on specifically claiming user performance, see *Rembrandt Data Technologies v. AOL*, 641 F.3d 1331, 1339–40 (Fed. Cir. 2011) (applying *IPXL* doctrine where the claims at issue did not claim user action), claim 1 of the ’022 patent explicitly claims user performance for “inputting a numerical value to define desired particle matter size.” ’022 patent at 3:9–10.

The Court agrees with Midnight that the language in claim 1 of the ’022 patent makes it unclear to a POSITA where the infringement would occur, and that claim 1 improperly claims both an apparatus and a method for its use. Thus, the Court concludes that claim 1 of the ’022 patent is indefinite.

**B. IPR Estoppel**

In its petition for *inter partes* review (IPR), Midnight relied on the instruction manual for a prior art air purifier system called “Clean Air 5eever.” In the proceedings before this Court, Midnight relies on the Clean Air 5eever air purifier system to argue that claims 1–6 of the ’022 patent are obvious.
Wicked Clean argues that Midnight should be estopped under 35 U.S.C. § 315(e)(2) from relying on Clean Air 5ever because it was or could have been raised in the IPR proceedings. Generally, a petitioner who avails itself of the IPR procedures before the PTAB is estopped from alleging invalidity on grounds that petitioner “raised or reasonably could have raised” during the IPR proceedings. See 35 U.S.C. § 315(e)(2). Wicked Clean argues that Midnight is improperly seeking a “do-over” at the district court because it lost at the PTAB. According to Wicked Clean, Midnight is relying on the same prior art cited in its IPR petition and is trying to get around the estoppel statute by calling it a “system” instead of referring to the “instruction manual.”

Midnight argues that the estoppel statute is limited to invalidity theories based on patents or printed publications that were raised or reasonably could have been raised in IPR proceedings, which does not include prior art systems. See Zitovault, LLC v. Int’l Bus. Machines Corp., No. 3:16-CV-0962-M, 2018 WL 2971178, at *4 (N.D. Tex. Apr. 4, 2018). Midnight relied on the Clean Air 5ever Instruction Manual in the IPR proceedings, and Midnight argues that it should be permitted to assert obviousness in view of the Clean Air 5ever air purifier system in these district court proceedings.

Wicked Clean urges this court to interpret 35 U.S.C. § 315(e)(2) more broadly to preclude reliance on a prior art system when a printed publication describing that system was raised or reasonably could have been raised in IPR proceedings. See 35 U.S.C. § 311(b); Oil-Dri Corp. of Am. v. Nestle Purina Petcare Co., No. 15 C 1067, 2019 WL 861394, at *10 (N.D. Ill. Feb. 22, 2019). Wicked Clean also argues that this case is analogous to Wasica Fin. GmbH v. Schrader Intl, Inc., where the district court applied the estoppel statute to a prior art device because the physical sensor was “materially identical” to the patent that the defendant could have raised during IPR proceedings. 432 F. Supp. 3d 448, 454 (D. Del. 2020). Wicked Clean argues that, like in
Wasica, the Clean Air 5ever Instruction Manual and the Clean Air 5ever air purifier system here are “materially identical.”

In response, Midnight argues that (1) Wasica is only persuasive, and this Court should not adopt the “materially identical” standard, and (2) the Clean Air 5ever Instruction Manual does not adequately represent the Clean Air 5ever air purifier system (e.g., the figures of the filter in the Clean Air 5ever Instruction Manual are two-dimensional, whereas the filter in the Clean Air 5ever air purifier system itself is three-dimensional).

The Court agrees with Midnight that IPR estoppel applies only to invalidity defenses based on printed publications and not systems. See 35 U.S.C. § 311(b). Even though the Clean Air 5ever Instruction Manual describes the Clean Air 5ever air purifier system, Midnight could not have “reasonably raised” invalidity based on the Clean Air 5ever air purifier system in the IPR proceedings and therefore is not estopped from relying on the Clean Air 5ever air purifier system here. Intel. Ventures II LLC v. Kemper Corp., No. 6:16-CV-0081, 2016 WL 7634422, at *3 (E.D. Tex. Nov. 7, 2016) (“Regardless of any estoppel, defendants have considerable latitude in using prior art systems (for example, software) embodying the same patents or printed publications placed before the PTO in IPR proceedings.”).

VI. CONCLUSION

For the foregoing reasons, this Court finds that claim 1 of the ’022 patent is indefinite and GRANTS Midnight’s motion for summary judgment on indefiniteness. This Court also finds that Midnight is not estopped from relying on the Clean Air 5ever air purifier system and DENIES Wicked Clean’s motion regarding IPR estoppel.

Dated: February 4, 2022

/s/ Anthony Bryant
UNITED STATES DISTRICT JUDGE