

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

PARROT S.A., PARROT DRONES S.A.S.)
and PARROT INC.,)
)
Plaintiffs,)
)
v.) C.A. No. 16-682 (MN)
)
QFO LABS, INC.,)
)
Defendant.)

MEMORANDUM ORDER

At Wilmington this 12th day of April 2021:

IT IS HEREBY ORDERED that the claim terms of U.S. Patent Nos. 7,931,239 (“the ’239 Patent”) and 9,073,532 (“the ’532 Patent”) with agreed-upon constructions are construed as follows (*see* D.I. 123, Ex. A):

1. “homeostatic control system” means “system that automatically maintains stability and equilibrium at a desired orientation of the hovercraft” (’239 Patent, claim 1; ’532 Patent, claims 1 & 6)
2. “control system” means “system that automatically maintains stability and equilibrium at a desired orientation of the hovercraft” (’532 Patent, claims 21 & 24)
3. “dead reckoning” means “a method of estimating the position of the hovercraft based on its previous position and its course and speed over a known interval of time” (’239 Patent, claim 1; ’532 Patent, claims 1 & 21)
4. “gravitational reference” means “the direction of down” (’239 Patent, claim 1; ’532 Patent, claims 1 & 21)¹
5. “orientation” means “the angle with respect to down”²

¹ The parties reached agreement on this construction at the hearing. (*See* D.I. 131 at 58:23-59:10 & 90:10-14).

² The parties reached agreement on this construction at the hearing in light of the agreement on “gravitational reference.” (*See* D.I. 131 at 75:12-77:7 & 94:23-2).

Further, as announced at the hearing on March 26, 2021, IT IS HEREBY ORDERED that the disputed claim terms of the '239 and '532 Patents are construed as follows:

1. “thrusters” means “motors driving at least one fan blade to generate downwardly directed airflow that provides aerodynamic lift” ('239 Patent, claim 1; '532 Patent, claims 1 & 21)
2. “three-axis sensor system” means “a system having at least one sensor on each of the X, Y and Z axes to sense acceleration and/or force” ('239 Patent, claim 1; '532 Patent, claims 1 & 21)
3. “dynamically determines a gravitational reference” means “repeated determinations of the direction of down while in flight” ('239 Patent, claim 1; '532 Patent, claims 1 & 21)
4. “RC controller” shall be given its plain and ordinary meaning, which does not require the controller to be designed for one-handed holding ('239 Patent, claims 1 & 4; '532 Patent, claims 1 & 21)

The parties briefed the issues (*see* D.I. 108) and submitted an appendix containing intrinsic and extrinsic evidence (*see* D.I. 109 & 110), and Defendant QFO Labs, Inc. (“QFO”) provided a tutorial describing the relevant technology (D.I. 111).³ The Court carefully reviewed all submissions in connection with the parties’ contentions regarding the disputed claim terms, heard oral argument (*see* D.I. 131) and applied the following legal standards in reaching its decision:

I. LEGAL STANDARDS

“[T]he ultimate question of the proper construction of the patent [is] a question of law,” although subsidiary fact-finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837-38 (2015). “[T]he words of a claim are generally given their ordinary and customary meaning [which 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 patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (internal

³ Plaintiffs Parrot S.A., Parrot Drones S.A.S. and Parrot Inc. (collectively, “Parrot”) did not submit a tutorial.

citations and quotation marks omitted). Although “the claims themselves provide substantial guidance as to the meaning of particular claim terms,” the context of the surrounding words of the claim also must be considered. *Id.* at 1314. “[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent.” *Id.* at 1321 (internal quotation marks omitted).

The patent specification “is always highly relevant to the claim construction analysis . . . [as] it is the single best guide to the meaning of a disputed term.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). It is also possible that “the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316. “Even when the specification describes only a single embodiment, [however,] the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.” *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (internal quotation marks omitted) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

In addition to the specification, a court “should also consider the patent’s prosecution history, if it is in evidence.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). The prosecution history, which is “intrinsic evidence, . . . consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent.” *Phillips*, 415 F.3d at 1317. “[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the

invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.*

In some cases, courts “will need to look beyond the patent’s intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period.” *Teva*, 135 S. Ct. at 841. Extrinsic evidence “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Markman*, 52 F.3d at 980. Expert testimony can be useful “to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Phillips*, 415 F.3d at 1318. Nonetheless, courts must not lose sight of the fact that “expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Id.* Overall, although extrinsic evidence “may be useful to the court,” it is “less reliable” than intrinsic evidence, and its consideration “is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

I. THE COURT’S RULING

The Court’s ruling regarding the disputed claim terms of the ’239 and ’532 Patents was announced from the bench at the conclusion of the hearing as follows:

. . . We started with six disputed claim terms in two patents.^[4]
During the argument, the parties came to agreement on two of those

⁴ The ’532 Patent is a continuation of the ’239 Patent. Because the patents share a common specification, the Court only cites to the ’239 Patent in this ruling.

terms. I am prepared to rule on the remaining disputes. I will not be issuing a written opinion, but I will issue an order stating my ruling. I want to emphasize before I announce my decisions that although I am not issuing a written opinion, we have followed a full and thorough process before making the decisions I am about to state. I have reviewed the patents in dispute and the evidence submitted by the parties, including portions of the prosecution history of the '239 Patent as well as extrinsic evidence. There was full briefing on each of the disputed terms. There has been argument here today. All of that has been carefully considered.

I am not going to read into the record my understanding of claim construction law generally. I have a legal standard section that I have included in earlier opinions, including recently in *Best Medical International v. Varian Medical Systems, Inc.*, C.A. No. 18-1599. I incorporate that law and adopt it into my ruling today and will also set it out in the order that I issue.^[5]

As for the disputed terms, each of the terms appears in both of the asserted patents, and the parties agree that the terms should have the same construction in both patents.

The first term is “thrusters” in claim 1 of the '239 Patent and claims 1 and 21 of the '532 Patent. Parrot proposes the construction “motors powering ducted fans that generate force in the direction of the ground.” QFO proposes that it means “a motor driving at least one blade to generate a thrust as a downwardly directed airflow that provides aerodynamic lift.”

There is some agreement between the parties on certain aspects of the construction of this term. The parties agree that “thrusters” require a motor that powers a fan (or fan blade) to generate a force in the downwardly direction – *i.e.*, towards the ground.

Their dispute centers around whether the thrusters must use ducted fans. Non-ducted fans, such as traditional rotors, use exposed fan blades that rotate and push air downward to generate lift. Ducted fans use the same principle of rotating fan blades to push air downward to generate lift, but ducted fans have their blades surrounded by a ring or cylindrical structure.^[6]

⁵ The parties did not raise any disputes as to the person of ordinary skill in the art (“POSA”) that are relevant to the issues raised in connection with claim construction.

⁶ (*See* '239 Patent at 2:51-53).

Starting with the claim language itself, claim 1 of the '239 Patent and claims 1 and 21 of the '532 Patent recite “thrusters” that are electrically powered and provide lift for the craft. The claims do not explicitly require the thrusters be powered by ducted fans. This stands in contrast to claim 3 of the '239 Patent, which depends from claim 1 and further limits the “thrusters,” reciting “wherein each of said thrusters comprises an electrically powered ducted fan.” Similarly, claims 3 and 7 of the '532 Patent depend from claim 1 of that patent and recite further limitations providing ducts for the thrusters. This suggests that the “thrusters” of the independent claims may – but need not – use ducted fans to generate the lift. That is, the dependent claims suggest that the patentees knew how to claim thrusters that required ducted fans but chose not to.

Turning to the specification, there is no explicit definition of “thruster” or “thrusters.” Parrot argues, however, that the disclosure limits the “thrusters” used in the invention to those that use ducted fans. Yet the cited portions of the specification make clear that the patent is referring to preferred embodiments – not the invention as a whole. For example, in the summary of invention that Parrot relies on, the patent provides that the “present invention is a homeostatic flying hovercraft that preferably utilizes at least two pairs of counter-rotating ducted fans to generate lift”^[7] Parrot also cites part of the patent that distinguishes the present invention from the prior art, but that disclosure also makes clear it is referring to a preferred embodiment.^[8] Moreover, the specification explains other shortcomings of the prior art beyond the ducted vs. non-ducted issue that may be addressed by certain aspects of the invention – *e.g.*, using permanent magnet motors for less power consumption.^[9] I am not persuaded that a POSA viewing the specification would understand that the patentees limited the claimed invention to require thrusters that only used ducted fans. There is likewise nothing in the prosecution history that would indicate the patentees limited the invention in this way.

Therefore, I will construe “thrusters” to mean “motors driving at least one fan blade to generate downwardly directed airflow that provides aerodynamic lift.”

⁷ ('239 Patent at 6:11-13).

⁸ (*Id.* at 6:43-49 (“Instead of trying to use the rotation of the craft or the spinning of rotor blades to provide aerodynamic lift, the preferred embodiment of the homeostatic flying saucer uses four battery-powered ducted fans housed completely inside the craft”)).

⁹ (*See, e.g., id.* at 7:17-30).

The second term is “three-axis sensor system” which appears in claim 1 of the ’239 Patent and claims 1 and 21 of the ’532 Patent. Parrot proposes that the term be construed as “system within a homeostatic control system having at least one pair of active and passive accelerometers on each axis of the hovercraft.” QFO asserts that no construction is necessary or alternatively “a 3-axis sensor system to detect acceleration/force in each of 3 mutually orthogonal directions.”

The dispute between the parties seems to be whether the “three-axis sensor system” requires active and passive accelerometers on each of the X, Y and Z axes.

Turning to the claim language, claim 1 of the ’239 Patent recites: “a homeostatic control system operably connected to said thrusters . . . said homeostatic control system including at least a three-dimensional, three-axis sensor system and associated control circuitry that dynamically determines a gravitational reference.” Claims 1 and 21 of the ’532 Patent recite the same language for the “three-axis sensor system.” The claims themselves have no specific requirements as to the types of sensors to be used in the “three-axis sensor system.”

The specification does not define or refer to a “three-axis sensor system,” but it does discuss an “XYZ sensor arrangement and associated control circuitry” and both parties treat this XYZ sensor system as a “three-axis sensor system,” though QFO disputes that the claims are limited to the particulars of the XYZ sensor system described.

Parrot argues that the specification limits the “three-axis system” to a structural arrangement that requires at least two pairs of active and passive accelerometers on each of the three X, Y and Z axes.^[10] That portion of the specification describes an embodiment in which there is an X-axis sensor system, a Y-axis sensor system and a Z-axis sensor system.^[11] In that embodiment, the X- and Y-axis sensor systems have varying numbers of sensors to sense acceleration or acceleration and gravity in the X and Y planes.^[12] The Z-axis has sensors to sense yaw in the Z plane.^[13]

¹⁰ (D.I. 108 at 26).

¹¹ (’239 Patent at 11:14-16).

¹² (*Id.* at 11:16-23).

¹³ (*Id.* at 11:24-26).

The specification then states that “[p]referably, the X-axis sensor system comprises two sets of active accelerometers and two sets of passive accelerometers oriented in the X plane. Similarly, the Y-axis sensor system comprises two sets of active accelerometers and two sets of passive accelerometers oriented in the Y plane.”¹⁴ Although the preferred embodiment is described with four sensors per plane, the specification explains that increasing numbers per plane could be used to enhance resolution and accuracy.¹⁵ In Parrot’s view and based on this disclosure, the claimed invention requires both types of accelerometers – active and passive – on each of the three axes to determine where the ground plane is and allow for calculation of the “raw tilt value” that indicates orientation of the craft relative to the ground. QFO argues that Parrot is using an embodiment to import limitations into the claim. QFO points out that the specification contemplates using other types of sensors beyond active and passive accelerometers.¹⁶ The Court agrees. For example, at column 13, line 34 through column 14, line 64, the ’239 Patent describes using other components to assist in controlling the orientation of the craft. In particular, one alternative to accelerometers appears to be use of mercury tilts and piezo gyros in the X, Y and Z axes to assist in stabilizing the craft. Contrary to Parrot’s suggestion that this alternative embodiment has nothing to do with “homeostatic control” or a “three-axis sensor system,” in this discussion of using of piezo gyros, the patent refers to “homeostatic hover control” and XYZ axis.¹⁷ Reading this, a POSA would understand that piezo gyros can be sensors of a three-axis sensor system that assists in providing homeostatic control.¹⁸

Therefore, I decline to limit the claimed “three-axis sensor system” to one requiring active and passive accelerometers. And I will construe “three-axis sensor system” as “a system having at least one sensor on each of the X, Y and Z axes to sense acceleration and/or force.”

The third term is “gravitational reference” in claim 1 of the ’239 Patent and claims 1 and 21 of the ’532 Patent. During the

¹⁴ (*Id.* at 11:27-31).

¹⁵ (*Id.* at 11:40-44).

¹⁶ (D.I. 108 at 28-29).

¹⁷ (’239 Patent at 14:54-64).

¹⁸ (*See id.* at 13:39-41 (piezo gyros provide information on the x, y and z planes)).

argument the parties agreed that “gravitational reference” means the direction of down. I will adopt that construction.

The fourth term is “dynamically determines a gravitational reference.” Parrot proposes the construction “while moving in flight makes multiple, independent determinations of where the ground plane is located.” During the argument, Parrot agreed to amend the construction to “while moving in flight makes repeated, independent determinations of where down is.” QFO proposes that no construction is necessary or alternatively “repeated determinations of a gravitational reference vector (the direction of down) while in flight.”

There are two basic disputes here. First, whether the determinations must be independent, and second, whether the determinations must be made while the claimed hovercraft is moving or if can be made while it is hovering.

As to independent, Parrot acknowledges that it included that term, not because that word is used in the patent, but because it helps to distinguish dynamic systems from dead reckoning ones, which are excluded in the claims. QFO agrees that a dynamic system is not a system that refers back to earlier determinations, but argues that the claim language excluding dead reckoning makes the word “independent” redundant. I agree. And I also think that including the word “independent” may add confusion given the different claim language in the two patents about the extent to which dead reckoning is excluded.

As to the dispute as to whether the hover craft must be moving in flight or simply in flight and not necessarily moving, such as when hovering, I agree with QFO. The claimed invention is directed to a system that controls thrusters to “maintain homeostatic stabilization in said desired orientation,” which can include a flat hovering orientation.^[19] There is nothing in the claims or the specification that would exclude determinations made during hovering.

Thus, I will construe “dynamically determines a gravitational reference” to mean “repeated determinations of the direction of down while in flight.”

The fifth term is “RC controller” in claims 1 and 4 of the ’239 Patent and claims 1 and 21 of the ’532 Patent. . . . Parrot

¹⁹ (’239 Patent, Claim 1 at 15:20-22).

proposes to construe the term as “remote controller designed to be held in one hand.” QFO contends that no construction is necessary but, if construed, the term means “a controller remote from the craft being controlled (typically by sending signals by radio communications).”

Both parties agree that the ordinary meaning of “RC controller” is “radio controlled controller.” The fundamental dispute over this term is whether the “RC controller” is designed for one-handed use, as Parrot contends, or allows for two-handed use, as QFO contends.

Starting with the language of the claims, claim 1 of the ’239 Patent recites “an RC controller separate and remote from said flying structure . . . said RC controller including . . . a handheld structure housing a sensor system . . .” Claim 1 of the ’532 Patent recites “a handheld RC controller separate and remote from the RC flying hovercraft” in the preamble and claim 21 recites “a handheld RC controller separate from the craft” in the preamble. And claims 1 and 21 of the ’532 Patent further recite that the RC controller has “a handheld structure” that houses a sensor system, the latter of which is used to control the craft. As this language demonstrates, all of the claims at issue require that the “RC controller” be handheld. But the claims do not explicitly require that the “RC controller” be designed for one-handed holding, as opposed to allowing for single- and double-handed holding. There is nothing in the claim that suggests the claimed “RC controller” that is “handheld” is one that requires a design for single-handed use.

There is also no explicit definition of the claimed “RC controller” in the specification, nor is there any definition of “handheld.”

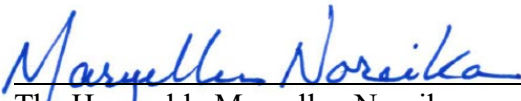
As Parrot points out, there is some discussion of a particular handheld controller in the specification. That controller – a handheld bee controller – is “designed to be held in the palm of one hand so that the fingers contact the four-way video control pad 230 and power button 232 while the thumb engages the control stick 222.”^[20] The specification then explains that “use of the hand-held bee controller is not limited to a flying saucer but can b[e] used to remotely control any radio controlled (RC) aircraft in a true control-by-wire, fly-by-wire construct. The hand-held RC controller

²⁰ (’239 Patent at 9:56-59).

includes a body adapted to be held in one hand.”^[21] That controller communicates the desired orientation to the RC aircraft.^[22] But these descriptions appear in the context of a preferred embodiment and are almost always referring to a “handheld bee controller.” The term appearing in the claim is a “RC controller” with a “handheld” structure – not a “handheld bee controller” as described in the specification. Although Parrot argues that the specification “implicitly defines the ‘RC Controller’ to be synonymous with the ‘one-handed bee controller,’”^[23] I am unpersuaded. The description of a “bee controller” in connection with a preferred embodiment here does not clearly indicate to a POSA that the patentees were defining the claimed “RC controller” to be limited to the particulars of the described “bee controller.” And there is nothing in the prosecution history that suggests the patentees understood the claimed “RC controller” to be limited to single-handed use.

Given that the claims already require the “RC controller” to be “handheld” and that there is no basis to read “handheld” in the claims to mean designed for one-handed use, no further construction is necessary. That is, “RC controller” will be given its plain and ordinary meaning, which does not require the “RC controller” be designed for one-handed holding.

The sixth and final term is “orientation” in claim 1 of the ’239 Patent and claims 1 and 21 of the ’532 Patent. During the argument the parties agreed that it means “the angle with respect to down.” I will adopt that construction.


The Honorable Maryellen Noreika
United States District Judge

²¹ (Id. at 10:10-14).

²² (Id. at 10:24-25).

²³ (D.I. 108 at 51).